

## NEW ISSUE

In the opinion of Nixon, Hargrave, Devans & Doyle LLP, Bond Counsel to the Authority, under existing law, and assuming compliance with the tax covenants described herein, interest on the Fiscal 1998 B Bonds is excluded from gross income for Federal income tax purposes under Section 103 of the Internal Revenue Code of 1986, as amended (the "Code") and is not treated as a preference item in calculating the alternative minimum tax imposed under the Code with respect to individuals and corporations. Interest on the Bonds is, however, included in the adjusted current earnings of certain corporations for purposes of computing the alternative minimum tax imposed on such corporations. Bond Counsel is further of the opinion that, under existing law, interest on the Fiscal 1998 B Bonds is exempt from personal income taxes of the State of New York and its political subdivisions, including The City of New York, as described more fully herein. See, however, "TAX EXEMPTION" herein regarding certain other tax considerations.

# **\$449,525,000**

## **New York City**

### **Municipal Water Finance Authority**

#### **Water and Sewer System Revenue Bonds, Fiscal 1998 Series B**

**Dated: Date of Delivery**

**Due: June 15, as shown below**

The Fiscal 1998 B Bonds will be issued as registered bonds and will be registered in the name of Cede & Co., as nominee of The Depository Trust Company, New York, New York, which will act as securities depository for the Fiscal 1998 B Bonds. Purchases of beneficial interests in such Fiscal 1998 B Bonds will be made in book-entry only form. Purchasers will not receive certificates representing the ownership interest in the Fiscal 1998 B Bonds purchased by them. See "APPENDIX F—BOOK-ENTRY-ONLY FORM".

Interest on the Fiscal 1998 B Bonds will accrue from their date of delivery and will be payable semiannually on each June 15th and December 15th commencing June 15, 1998. The Fiscal 1998 B Bonds will be issued in authorized denominations of \$5,000 and integral multiples thereof. The Fiscal 1998 B Bonds are subject to redemption prior to maturity as described herein.

**\$225,055,000 5¼% Fiscal 1998 B Term Bonds Due June 15, 2029, Yield 5.53%**

**\$224,470,000\* 5⅞% Fiscal 1998 B Term Bonds Due June 15, 2030, Yield 5.425%**

The proceeds of the Fiscal 1998 B Bonds are expected to be applied (i) to reimburse moneys to be drawn under irrevocable letters of credit to provide for the payment of the principal of and interest on \$400 million aggregate principal amount of the Authority's outstanding Commercial Paper Notes, (ii) to pay certain costs of issuance and (iii) to fund certain reserves.

**The Fiscal 1998 B Bonds are special obligations of the Authority, payable solely from and secured by a pledge of and first lien on the gross revenues of the System. The Authority has no taxing power. The Fiscal 1998 B Bonds are not a debt of the State of New York, The City of New York or the New York City Water Board and neither the State of New York, The City of New York nor the New York City Water Board is liable on the Fiscal 1998 B Bonds.**

The Fiscal 1998 B Bonds are offered when, as and if issued by the Authority and received by the Underwriters and subject to the approval of legality by Nixon, Hargrave, Devans & Doyle LLP, New York, New York, Bond Counsel. Certain legal matters will be passed upon for the Underwriters by Willkie Farr & Gallagher, New York, New York. It is anticipated that the Fiscal 1998 B Bonds will be available for delivery to The Depository Trust Company in New York, New York, on or about September 25, 1997.

**PaineWebber Incorporated    First Albany Corporation    Merrill Lynch & Co.**

**Artemis Capital Group, Inc.**

**Bear, Stearns & Co. Inc.**

**Goldman, Sachs & Co.**

**Lehman Brothers**

**J.P. Morgan & Co.**

**Morgan Stanley Dean Witter  
Morgan Stanley & Co. Incorporated**

**Prudential Securities Incorporated**

**William E. Simon & Sons Municipal Securities, Inc.**

**Smith Barney Inc.**

**Duke & Company Inc.**

**A.G. Edwards & Sons, Inc.**

**Fleet Securities, Inc.**

**David Lerner Associates Inc.**

**Roosevelt & Cross Incorporated**

September 18, 1997

\* Insured by Financial Guaranty Insurance Company.



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John P. Cahill, <i>ex officio</i>	<i>Member</i>
Charles E. Dorkey III	<i>Member</i>
Arthur B. Hill	<i>Member</i>
James P. Stuckey	<i>Member</i>

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Alan Anders	<i>Treasurer</i>
Marjorie E. Henning	<i>Secretary</i>
Patrick J. McCoy	<i>Manager of Investor Relations</i>
Valerie Mehallow	<i>Comptroller</i>

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Amaziah Howell	<i>Member</i>
David B. Rosenauer	<i>Member</i>
James T. B. Tripp	<i>Member</i>

Diana Chapin, Ph.D.	<i>Executive Director</i>
William Kusterbeck	<i>Treasurer</i>
Jack Serrano	<i>Deputy Treasurer</i>
Albert F. Moncure, Jr.	<i>Secretary</i>

**Authority Consultants**

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Consulting Engineer	<i>Metcalf &amp; Eddy of New York, Inc.</i>
Financial Advisor	<i>O'Brien Partners Inc./Samuel A. Ramirez &amp; Co., Inc.</i>
Rate Consultant	<i>Black &amp; Veatch</i>

This Official Statement does not constitute an offer to sell or the solicitation of an offer to buy any of the Fiscal 1998 B Bonds in any jurisdiction to any person to whom it is unlawful to make such offer in such jurisdiction. No dealer, salesperson or any other person has been authorized to give any information or make any representation, other than those contained herein, in connection with the offering of any of the Fiscal 1998 B Bonds and if given or made, such information or representation must not be relied upon. Neither the delivery of this Official Statement nor the sale of any of the Fiscal 1998 B Bonds implies that there has been no change in the affairs of the Authority, the Board or the City or the other matters described herein since the date hereof. The information set forth herein has been provided by the Authority, the Board and the City, but it is not guaranteed as to its accuracy or completeness and is not to be construed as a representation by the Underwriters.

IN CONNECTION WITH THIS OFFERING, THE UNDERWRITERS MAY OVERALLOT OR EFFECT TRANSACTIONS WHICH STABILIZE OR MAINTAIN THE MARKET PRICE OF THE FISCAL 1998 B BONDS AT A LEVEL ABOVE THAT WHICH MIGHT OTHERWISE PREVAIL IN THE OPEN MARKET. SUCH STABILIZING, IF COMMENCED, MAY BE DISCONTINUED AT ANY TIME.

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## SUMMARY STATEMENT

*The following is a brief summary of the information contained in this Official Statement and is subject in all respects to the additional information contained herein, including the appendices attached hereto. Defined terms have the same meaning herein as elsewhere in this Official Statement.*

Authority Contact:	Mr. Patrick McCoy Investor Relations Manager Phone Number: (212) 788-9170 Fax Number: (212) 788-9198
Use of Proceeds:	The Fiscal 1998 B Bonds are being issued (i) to reimburse moneys to be drawn under irrevocable letters of credit to provide for the payment of the principal of and interest on \$400 million aggregate principal amount of the Authority's outstanding Commercial Paper Notes, (ii) to pay certain costs of issuance and (iii) to fund certain reserves.
Description of the Bonds:	The Fiscal 1998 B Bonds are being issued by the Authority in the principal amount of \$449,525,000 pursuant to its Water and Sewer System General Revenue Bond Resolution adopted on November 14, 1985, as amended, and its Thirty-fourth Supplemental Resolution adopted on September 18, 1997. The Fiscal 1998 B Bonds are issued in authorized denominations of \$5,000 and integral multiples thereof, and are in book-entry only form.
Redemption Provisions:	The Fiscal 1998 B Bonds are subject to optional redemption and mandatory sinking fund redemptions as described herein. The Fiscal 1998 B Bonds are not subject to an extraordinary call.
Plan of Finance:	Simultaneously with the issuance of the Fiscal 1998 B Bonds, the Authority expects to issue a series of Second Resolution Bonds (the "1998 Series 3 Second Resolution Bonds") to the New York State Environmental Facilities Corporation (the "EFC") to refund outstanding Bonds held by EFC's nominee, by exchanging the 1998 Series 3 Second Resolution Bonds for them. To obtain funds to acquire the 1998 Series 3 Second Resolution Bonds, EFC intends simultaneously to offer to the public a series of bonds. The issuances of the Fiscal 1998 B Bonds and the 1998 Series 3 Second Resolution Bonds and the related uses of proceeds is collectively referred to herein as the "Plan of Finance".
Amendments to Resolution and Agreement:	The Authority previously has adopted its Twenty-second Supplemental Resolution to the Resolution modifying various provisions of the Resolution and authorized conforming amendments to the Agreement. The Twenty-second Supplemental Resolution, which requires the consent of the holders in principal amount of two-thirds of the Outstanding Bonds, is expected to become effective as a consequence of the issuance of the Fiscal 1998 B Bonds (the underwriters of which are expected to consent as the initial holders of the Fiscal 1998 B Bonds) and the reduction of

the principal amount of Bonds held by EFC, as contemplated by the Plan of Finance. The conforming amendments to the Agreement, which have been authorized by the Authority, are also expected to become effective after they are authorized by the Board and executed by the Board, the City and the Authority.

**The System:**

In 1996, the Water System provided an average of 1,404 million gallons per day (mgd) of water to approximately 820,000 accounts. It supplies water to approximately 9 million people, of which over 7,300,000 are in the City and the balance are in Westchester, Putnam, Orange and Ulster Counties. The Sewer System is comprised of an extensive network of sewer lines, catch basins, seepage basins and 14 treatment plants located in the City, as well as eight City owned treatment plants located in the upstate watershed. In 1996, the sewage treatment facilities treated on average approximately 1,405 mgd of dry-weather sewage. Under the Act, the Lease and the Agreement, the Board is obligated to pay the operating expenses of the System. The City is obligated to operate and maintain the System.

**Summary Financial Information:**

	Fiscal Years					
	Historical			Projected(2)		
	1995	1996	1997(1)	1998	1999	2000
	(Thousands of Dollars)					
Current Revenues Available for Debt						
Service .....	\$1,069,725	\$1,167,038	\$1,216,503	\$1,363,055	\$1,397,627	\$1,465,948
Additional Revenues .....	63,709	10,063	18,225	0	0	0
Gross System Revenues .....	1,133,434	1,177,101	1,234,728	1,363,055	1,397,627	1,465,948
Net Operating Expenses .....	592,906	614,405	590,108	641,117	642,532	650,532
Other Expenses (including Rental Payments to New York City) .....	151,248	175,989	185,543	211,482	183,672	177,299
Total Expenses .....	744,154	790,394	775,651	852,599	826,204	827,831
Total First Resolution Bond Debt Service .....	330,966	346,434	391,304	423,145	457,572	505,741
Net Debt Service on Second Resolution Bonds .....	0	0	22,060	63,462	85,196	106,651
Net Surplus .....	58,314	40,273	53,038	23,849	28,654	25,725
First Resolution Debt Service Coverage .....	1.44	1.60	1.54	1.56	1.46	1.40
First and Second Resolution Debt Service Coverage .....	1.44	1.60	1.52	1.48	1.39	1.33
Rate Increase .....	0.0%	5.0%	6.5%	6.5%	5.7%	5.7%

Totals may not add due to rounding.

(1) Fiscal Year 1997 is estimated.

(2) Projections for Fiscal Years 1998 through 2000 assume that the amendments made by the Twenty-second Supplemental Resolution and the conforming amendments to the Agreement have taken effect.

**Total Authority Debt Outstanding:**

As of the date of this Official Statement, the Authority has approximately \$6.56 billion of Bonds and \$1.06 billion of Second Resolution Bonds outstanding. See "CAPITAL IMPROVEMENT AND FINANCING PROGRAM—Debt Service Requirements". In addition, the Authority currently has a \$600 million commercial paper program.

**Payment Record:**

The Authority has never defaulted on any debt service payments.

**Capital Program:**

The City's Ten Year Capital Strategy published in May 1997 included a Capital Improvement Program applicable to the System for the period 1998 through 2007 (the "CIP"). The CIP includes projected expenditures of \$8.61 billion for water and sewer facilities of which approximately 98% is expected to be provided from System funds. The CIP is designed to maintain a satisfactory level of service, to improve operation of the System and to address future System requirements. The current capital plan published in September 1997 amends the Capital Improvement Program for Fiscal Years 1998 through 2001 and increases the total anticipated cost of the capital program for Fiscal Years 1998 through 2001 from \$5.0 billion to \$5.1 billion.

**Bond Financing Program:**

The following table shows total proceeds expected to be derived from Authority bond issues during the period from Fiscal Year 1998 to Fiscal Year 2003.

(Thousands of Dollars)

<u>FY 1998</u>	<u>FY 1999</u>	<u>FY 2000</u>	<u>FY 2001</u>	<u>FY 2002</u>	<u>FY 2003</u>	<u>Period Total</u>
\$1,678,680	\$804,329	\$861,105	\$1,038,904	\$1,166,673	\$1,214,973	\$6,764,664

**Security for the Bonds:**

**Revenue Pledge:**

The Bonds are special obligations of the Authority, payable solely from and secured by a pledge of the gross revenues of the System prior to the payment of operation and maintenance costs or any other expenses.

**Debt Service Reserve Fund:**

Upon the delivery of the Fiscal 1998 B Bonds, the Debt Service Reserve Fund will be funded in an amount at least equal to the maximum annual Adjusted Aggregate Debt Service on the Bonds.

**Rate Covenant:**

The Board has covenanted to establish and collect rates, fees and charges sufficient in each Fiscal Year so that Revenues collected in such Fiscal Year will be at least equal to the sum of (i) 115% of Aggregate Debt Service on all Bonds Outstanding and on any Projected Series of Bonds (excluding Refundable Principal Installments for the payment of which funds are held in trust) payable in such Fiscal Year, and (ii) 100% of the Operating Expenses and Required Deposits (which includes debt service on the Second Resolution Bonds and other subordinate debt) to the extent required to be paid from Revenues for such Fiscal Year.

**Additional Bonds Test:**

Additional Bonds may be issued only if the estimated Revenues for the Fiscal Year in which such Bonds are issued and each of the five Fiscal Years following the issuance of such Bonds will be at least equal to the sum of (x) 115% of the maximum estimated Adjusted Aggregate Debt Service on all Bonds, including the Bonds to be issued, and (y) 100% of the sum of the projected Operating Expenses and Required Deposits (including Debt Service Reserve Fund replenishment and subordinate debt service) for such Fiscal Years and only if the Revenues for either of the last two Fiscal Years preceding the Fiscal Year in which the Bonds are to be issued were at least equal to the sum of (i) 115% of the Aggregate Debt Service for such Fiscal Year (excluding any Principal Installments,

or portion thereof, paid from sources other than the Revenues) and (ii) 100% of the sum of Operating Expenses and Required Deposits for such Fiscal Year. Refunding Bonds may be issued under the Resolution either upon satisfaction of such conditions or other conditions. Second Resolution Bonds may be issued under the Second Resolution only if the Revenues for either of the last two Fiscal Years preceding the Fiscal Year in which the Bonds are to be issued were at least equal to the sum of (i) 110% of the Aggregate Debt Service for such Fiscal Year on the First Resolution Bonds, the Second Resolution Bonds and certain other Subordinate Indebtedness (excluding any Debt Service paid from sources other than the Revenues) and (ii) 100% of the sum of Operating Expenses and Required Deposits for such Fiscal Year. Refunding Second Resolution Bonds may be issued under the Second Resolution either upon satisfaction of such conditions or other conditions.

**Rates:**

Rates, fees and charges are imposed by the Board and are not subject to regulatory approval except for those rates charged to a limited class of upstate users representing less than 1% of Revenues and as provided under certain Federal grants.

**The Authority:**

The Authority, a separate legal entity established in 1984, has the power to (i) issue bonds, bond anticipation notes and other obligations for the purpose of financing the renovation and improvement of the System, (ii) refund its bonds and notes and general obligation bonds of the City issued for water or sewer purposes, (iii) require the Board to fix rates sufficient to pay the costs of operating and financing improvements to the System and (iv) require the City to maintain the System adequately. The Authority has no taxing power.

**The Board:**

The Board, a separate legal entity established in 1984, has leased the System from the City. It is authorized to fix and collect rates, fees and charges adequate to pay the cost of operating and financing the System.

**The Agreement:**

Pursuant to the Agreement, the Authority has agreed to finance all or a portion of the CIP, both current and work commenced in prior years, through the issuance of bonds, notes or other indebtedness secured by revenues of the System.

**The Lease:**

Pursuant to the Lease, the Board has acquired the System from the City for a term equal to the longer of 40 years from July 1, 1985 or until provision has been made for the repayment of all Outstanding Bonds or other indebtedness of the Authority.

**Financial Statements:**

The financial statements (for the years ended June 30, 1995 and June 30, 1996) of the New York City Water and Sewer System included in Appendix D to this Official Statement have been audited by KPMG Peat Marwick, LLP, independent certified public accountants, to the extent and for the periods indicated in their report thereon.

## OFFICIAL STATEMENT

**\$449,525,000**

**New York City Municipal Water Finance Authority  
Water and Sewer System Revenue Bonds,  
Fiscal 1998 Series B**

### INTRODUCTORY STATEMENT

The purpose of this Official Statement is to set forth certain information pertaining to the New York City Municipal Water Finance Authority (the "Authority"), a public benefit corporation duly created and existing under the New York City Municipal Water Finance Authority Act, as amended (the "Act"); the New York City Water Board (the "Board"), a public benefit corporation created and existing under Chapter 515 of the Laws of 1984, both of which laws were enacted by the Legislature of the State of New York (the "State"); and the Authority's \$449,525,000 Water and Sewer System Revenue Bonds, Fiscal 1998 Series B (the "Fiscal 1998 B Bonds"). Capitalized terms used in this Official Statement and not defined herein shall have the meanings ascribed thereto in "APPENDIX C—GLOSSARY AND SUMMARY OF CERTAIN DOCUMENTS—Glossary".

Pursuant to a lease agreement (the "Lease") between the Board and The City of New York (the "City"), dated as of July 1, 1985, as amended, the Board has leased from the City its facilities for the collection, transmission and distribution of water (the "Water System") and its facilities for the collection, treatment and disposal of sewage (the "Sewer System") (collectively, the "System"). As required by the Act and the Lease, the System is operated and maintained by the Department of Environmental Protection of the City ("DEP"). The Board has also entered into a financing agreement, dated as of July 1, 1985, as amended (the "Agreement"), with the Authority and the City for the financing of capital improvements to the System through the issuance of bonds, notes and other obligations (the "Bonds") under its Water and Sewer System General Revenue Bond Resolution adopted on November 14, 1985, as amended (the "Resolution"), or subordinate obligations of the Authority under its Second Resolution (defined below). Pursuant to the Lease and the Agreement, the Board has agreed to cause rates, fees and charges to be collected.

The Fiscal 1998 B Bonds will be issued by the Authority pursuant to the Resolution and its Thirty-fourth Supplemental Resolution adopted on September 18, 1997 (the "Supplemental Resolution"). The Resolution and the Supplemental Resolution are collectively referred to herein as the "Resolutions". United States Trust Company of New York serves as trustee under the Resolutions (in such capacity, the "Trustee") and will continue to serve as Trustee until a successor is appointed by the Bondholders in accordance with the Resolutions. The Authority has issued subordinate revenue bonds (the "Second Resolution Bonds") pursuant to its Water and Sewer System Second General Revenue Bond Resolution adopted on March 30, 1994, as amended (the "Second Resolution").

The Bonds are special obligations of the Authority, payable solely from and secured by a pledge of the Revenues, all moneys or securities in any of the funds and accounts established under the Resolution, including the Debt Service Reserve Fund, and all other moneys and securities to be received, held or set aside pursuant to the Resolution, subject only to provisions of the Resolution and the Agreement relating to the use and application thereof. The Board has covenanted in the Agreement to maintain rates, fees and charges at sufficient levels to produce in each twelve month period beginning on July 1 (a "Fiscal Year") an amount equal to 115% of the Aggregate Debt Service and Projected Debt Service on the Bonds (excluding Refundable Principal Installments for the payment of which funds are held in trust) to become due in such Fiscal Year on Bonds, plus 100% of the operation and maintenance expenses of the System certified by the City and of Required Deposits (which includes the debt service on the Second Resolution Bonds and other subordinate debt) to the extent required to be paid from Revenues. The Agreement requires a report of the Rate Consultant setting forth its recommendations as to any revisions of the rates, fees and charges necessary or advisable to meet the requirements of the rate covenant. See "SECURITY FOR THE BONDS—Rate Covenant". The Agreement also requires a Consulting Engineer to review the operation and maintenance of the System, and further requires the City to operate and maintain the System in accordance with the advice and recommendations of the Consulting Engineer. See "SECURITY FOR THE BONDS".

Rates, fees and charges are imposed by the Board and are not subject to regulatory approval nor are they subject to other regulations under current law except for the rates charged to a limited class of upstate users, representing less than 1% of Revenues, or as required by certain Federal grants. See "THE SYSTEM—Governmental Regulation" and "RATES AND BILLINGS".

The estimates and projections contained in this Official Statement are based on, among other factors, evaluations of historical revenue and expenditure data and analyses of economic trends affecting the Authority's finances. The financial projections contained herein are subject to certain contingencies which cannot be quantified and are subject to the uncertainties inherent in any attempt to predict the results of future operations. Accordingly, such projections are subject to periodic revision which may involve substantial change. Consequently, the Authority makes no representation or warranty that these estimates and projections will be realized.

The Authority has relied upon the authority of Metcalf & Eddy of New York, Inc. ("Metcalf & Eddy") for certain engineering feasibility information and upon the authority of Black & Veatch for certain financial estimates and projections. See "ENGINEERING FEASIBILITY LETTER AND FORECASTED CASH FLOWS".

### PLAN OF FINANCE

Simultaneously with issuance of the Fiscal 1998 B Bonds, the Authority expects to issue the 1998 Series 3 Second Resolution Bonds to refund Outstanding Bonds held by EFC's nominee, by exchanging the 1998 Series 3 Second Resolution Bonds for them. To obtain funds to acquire the 1998 Series 3 Second Resolution Bonds, EFC intends simultaneously to offer to the public a series of bonds. The inability to complete the Plan of Finance, including the issuance by EFC of its bonds, would postpone the date on which the Twenty-second Supplemental Resolution and the related amendments of the Agreement take effect. See "AMENDMENTS OF THE RESOLUTION AND THE AGREEMENT".

### USE OF PROCEEDS

It is anticipated that the proceeds of the Fiscal 1998 B Bonds will be applied in the following manner:

To reimburse Letter of Credit Banks .....	\$401,847,842
Deposit to the Debt Service Reserve Fund .....	23,319,475
Premium for the Policy .....	1,802,728
Underwriters' Discount .....	2,577,378
Original Issue Discount .....	19,674,528
Costs of Issuance .....	303,049
Principal Amount of the Fiscal 1998 B Bonds .....	<u>\$449,525,000</u>

A portion of the proceeds of the Fiscal 1998 B Bonds will be applied to reimburse Canadian Imperial Bank of Commerce ("CIBC") on the Series One Notes, as defined below, and Landesbank Hessen-Thüringen Girozentrale ("HELABA"), Bayerische Landesbank Girozentrale ("Bayerische") and Westdeutsche Landesbank Girozentrale on the Series Five Notes, as defined below ("WestLB", and collectively with CIBC, HELABA and Bayerische, the "Letter of Credit Banks"), for moneys to be drawn under irrevocable letters of credit issued by the Letter of Credit Banks to provide for payment of the principal of, and interest on, \$200 million aggregate principal amount of the Authority's Commercial Paper Notes, Series One maturing on or before December 18, 1997 (the "Series One Notes") and \$200 million aggregate principal amount of the Authority's Commercial Paper Notes, Series Five maturing on or before December 18, 1997 (the "Series Five Notes"). Pursuant to Escrow Deposit Agreements between the Authority and United States Trust Company of New York (the "Escrow Agent"), a portion of the moneys advanced by the Letter of Credit Banks will be irrevocably deposited in trust with the Escrow Agent in amounts sufficient to make or provide for full and timely payment of the maturing principal of and interest on the outstanding Series One Notes and Series Five Notes as they mature. Upon such irrevocable deposit, the Series One Notes and Series Five Notes will no longer be deemed to be outstanding and all liens and pledges established for their benefit will be discharged.

**THE FISCAL 1998 B BONDS**

**General**

The Fiscal 1998 B Bonds initially delivered to the Underwriters will be dated their date of delivery. The Fiscal 1998 B Bonds will mature on and bear interest payable on the dates and at the rates shown on the cover of this Official Statement.

Principal of, and redemption premium, if any, and interest on, the Fiscal 1998 B Bonds will be payable in lawful money of the United States of America. The Fiscal 1998 B Bonds will be issued only as fully registered bonds without coupons in denominations of \$5,000 and integral multiples thereof.

**Book-Entry Only**

The Fiscal 1998 B Bonds will be issued as registered bonds and will be registered in the name of Cede & Co., as nominee of The Depository Trust Company ("DTC"), which will act as securities depository for the Fiscal 1998 B Bonds. Purchases of beneficial interests in such Fiscal 1998 B Bonds will be made in book-entry only form. Purchasers will not receive certificates representing the ownership interest in the Fiscal 1998 B Bonds purchased by them. See "APPENDIX F—BOOK-ENTRY-ONLY FORM".

**Redemption of Fiscal 1998 B Bonds**

*Sinking Fund Redemption.* The Fiscal 1998 B Term Bonds due June 15, 2029 are subject to mandatory redemption prior to maturity in part, by lot, in such manner as the Trustee may reasonably determine, at a redemption price of 100% of the principal amount thereof, plus accrued interest to the redemption date, on June 15 in each of the years and in the respective principal amounts, as follows:

<b>Fiscal 1998 B Bonds Maturing June 15, 2029</b>	
<u>Year</u>	<u>Amount</u>
2028	\$109,650,000
2029†	115,405,000

† Final Maturity

*Purchased Bonds.* The Authority may from time to time direct the Trustee to purchase Fiscal 1998 B Bonds with moneys in the Debt Service Fund, at a price not greater than par, plus accrued interest to the date of such purchase, and apply any Fiscal 1998 B Bonds so purchased as a credit, at 100% of the principal amount or accreted value thereof, against and in fulfillment of a required Sinking Fund Installment on the Fiscal 1998 B Bonds of the same maturity. Any excess of the amounts so credited over the amount of a Sinking Fund Installment will be credited against future Sinking Fund Installments. To the extent that the Authority's obligation to make Sinking Fund Installments in a particular year is fulfilled through such purchases, the likelihood of redemption through mandatory Sinking Fund Installments of any Fiscal 1998 B Bonds of the maturity so purchased will be reduced for such year.

*Optional Redemption.* The Fiscal 1998 B Bonds are subject to redemption prior to maturity at the option of the Authority from any moneys available therefor on and after June 15, 2007, in whole at any time or in part on any interest payment date, by lot, at the redemption prices (expressed as percentages of the principal amount of such Fiscal 1998 B Bonds to be redeemed) set forth below plus accrued interest to the redemption date.

<u>Redemption Period (both dates inclusive)</u>	<u>Optional Redemption Prices</u>
June 15, 2007 to June 14, 2008 .....	101%
June 15, 2008 and thereafter .....	100

*Notice of Redemption.* Notice of redemption is to be given by first class mail, postage prepaid, at least 30 days prior to the date fixed for redemption, to the registered owners of Fiscal 1998 B Bonds to be redeemed at their addresses shown on the books of registry. So long as Cede & Co., as nominee of DTC, is the registered owner of the Fiscal 1998 B Bonds, notice of redemption is to be sent to DTC. No assurance can be given by the

Authority that DTC and DTC participants will promptly transmit notices of redemption to Beneficial Owners. See "APPENDIX F—BOOK-ENTRY-ONLY FORM".

If, on any redemption date, monies for the redemption of the Fiscal 1998 B Bonds to be redeemed, together with interest thereon to the redemption date, are held by the Trustee so as to be available therefor on such date, and if notice of redemption has been mailed, then interest on the Fiscal 1998 B Bonds to be redeemed will cease to accrue from and after the redemption date and such Fiscal 1998 B Bonds will no longer be considered to be Outstanding under the Resolution.

### **FINANCIAL GUARANTY INSURED BONDS**

Concurrently with the issuance of the Fiscal 1998 B Bonds, Financial Guaranty Insurance Company ("Financial Guaranty") will issue its Municipal Bond New Issue Insurance Policy (the "Policy") for the Fiscal 1998 B Bonds due June 15, 2030 (the "Insured Fiscal 1998 B Bonds"). The Policy unconditionally guarantees the payment of that portion of the principal of and interest on the Insured Fiscal 1998 B Bonds which has become due for payment, but shall be unpaid by reason of nonpayment by the Authority of the Insured Fiscal 1998 B Bonds. Financial Guaranty will make such payments to State Street Bank and Trust Company, N.A., or its successor as its agent (the "Fiscal Agent"), on the later of the date on which such principal and interest is due or on the business day next following the day on which Financial Guaranty shall have received telephonic or telegraphic notice, subsequently confirmed in writing, or written notice by registered or certified mail, from an owner of Insured Fiscal 1998 B Bonds or the Paying Agent of the nonpayment of such amount by the Authority. The Fiscal Agent will disburse such amount due on any Insured Fiscal 1998 B Bond to its owner upon receipt by the Fiscal Agent of evidence satisfactory to the Fiscal Agent of the owner's right to receive payment of the principal and interest due for payment and evidence, including any appropriate instruments of assignment, that all of such owner's rights to payment of such principal and interest shall be vested in Financial Guaranty. The term "nonpayment" in respect of an Insured Fiscal 1998 B Bond includes any payment of principal or interest made to an owner of an Insured Fiscal 1998 B Bond which has been recovered from such owner pursuant to the United States Bankruptcy Code by a trustee in bankruptcy in accordance with a final, nonappealable order of a court having competent jurisdiction.

The Policy is non-cancellable and the premium will be fully paid at the time of delivery of the Insured Fiscal 1998 B Bonds. The Policy covers failure to pay principal of the Insured Fiscal 1998 B Bonds on their stated maturity date, and not on any other date on which the Insured Fiscal 1998 B Bonds may have been otherwise called for redemption, accelerated or advanced in maturity, and covers the failure to pay an installment of interest on the stated date for its payment.

Reference should be made to "RATINGS" in this Official Statement for a discussion of ratings assigned to the Insured Fiscal 1998 B Bonds and the basis for their assignment to the Insured Fiscal 1998 B Bonds and for a discussion of the ratings assigned to the Authority's outstanding parity debt that is not secured by credit enhancement.

The Policy is not covered by the Property/Casualty Insurance Security Fund specified in Article 76 of the New York Insurance Law.

Financial Guaranty is a wholly-owned subsidiary of FGIC Corporation (the "Corporation"), a Delaware holding company. The Corporation is a subsidiary of General Electric Capital Corporation ("GE Capital"). Neither the Corporation nor GE Capital is obligated to pay the debts of or the claims against Financial Guaranty. Financial Guaranty is a monoline financial guaranty insurer domiciled in the State of New York and subject to regulation by the State of New York Insurance Department. As of March 31, 1997, the total capital and surplus of Financial Guaranty was approximately \$1,123,724,061. Financial Guaranty prepares financial statements on the basis of both statutory accounting principles and generally accepted accounting principles. Copies of such financial statements may be obtained by writing to Financial Guaranty at 115 Broadway, New York, New York 10006, Attention: Communications Department (telephone number: 212-312-3000) or to the New York State Insurance Department at 160 West Broadway, 18th Floor, New York, New York 10013, Attention: Financial Condition Property/Casualty Bureau (telephone number: 212-602-0389).



## AMENDMENTS OF THE RESOLUTION AND THE AGREEMENT

In 1993, the Authority adopted its Twenty-second Supplemental Resolution providing for the amendment of the Resolution. Such amendment will become effective upon consent thereto of the holders of two-thirds of the principal amount of Outstanding Bonds. The City, the Authority and the Board also have agreed to amend the Agreement in order to conform the Agreement to the Resolution. The conforming amendments to the Agreement are expected to become effective after they are authorized by the Board and executed by the Board, the City and the Authority.

The Authority has obtained the consent of the holders of Bonds issued in the past in order to obtain the consent of the holders of two-thirds in aggregate principal amount of Outstanding Bonds. As of September 1, 1997, the Authority had received consents from the holders of approximately \$4.16 billion of the approximately \$6.56 billion of currently Outstanding Bonds (Capital Appreciation Bonds are included at their accreted value as of September 1, 1997). The Authority expects that, upon the issuance of the Fiscal 1998 B Bonds, PaineWebber Incorporated, as representative of and on behalf of the Underwriters and as the initial registered holder of the Fiscal 1998 B Bonds, will consent to the amendments to the Resolution and the Agreement. If such consents are given and the Plan of Finance is completed, the Authority will have obtained the consent of the holders of two-thirds in aggregate principal amount of Outstanding Bonds and the amendments will take effect after they are filed with the Trustee and notice thereof has been given to the holders of the Outstanding Bonds. If such consents are not received or the Plan of Finance is not completed, the Twenty-second Supplemental Resolution and the related amendments to the Agreement will not take effect until additional consents are obtained. In such case the Authority may seek the consent of the holders of currently Outstanding Bonds (including EFC) and will seek the consent of the underwriters, as the initial holders, of Bonds to be issued in the future.

The amendment to the Resolution would, among other things, (i) permit the investment of money in certain repurchase agreements, investment agreements, money market funds and municipal obligations, (ii) amend the definition of Debt Service with respect to interest on Variable Rate Bonds, (iii) provide that a Special Account may be established in the Debt Service Reserve Fund with respect to any Series of Bonds designated by the Authority and that the Authority may specify the Debt Service Reserve Requirement, if any, with respect to such Series of Bonds, (iv) delete the requirement that Financial Guaranties must be drawn upon 30 days prior to the expiration thereof, (v) amend the definition of Revenues to include certain subsidy payments, including amounts payable by EFC to the Authority, and amounts derived from a counterparty pursuant to an interest rate exchange agreement, (vi) permit investment earnings on the amounts on deposit in the Debt Service Reserve Fund (in excess of the requirement thereof) to be transferred to the Revenue Fund, (vii) permit amounts on deposit in the Debt Service Reserve Fund to be invested in any Investment Security, without limitation on the maturity thereof, (viii) require the Trustee to value investments on deposit in the Funds and Accounts at the amortized cost of such investments or the market value thereof, whichever is lower, (ix) allow Parity Bond Anticipation Notes to mature on any date, and (x) allow the Authority to specify Bond Payment Dates in a Supplemental Resolution authorizing a Series of Bonds. See "APPENDIX C—GLOSSARY AND SUMMARY OF CERTAIN DOCUMENTS—Summary of the Resolution".

The amendment to the Agreement also would amend the definition of Revenues to include certain subsidy payments, including amounts payable by EFC to the Authority, and amounts derived from a counterparty pursuant to an interest rate exchange agreement. Additionally, the Agreement would be amended to allow monies on deposit in the General Account of the Operation and Maintenance Reserve Fund to be applied to the payment of Bonds in accordance with Article XII of the Resolution.

## SECURITY FOR THE BONDS

### Revenues

The Act empowers the Board to establish and collect rates, fees and charges for the use of service provided by the System in order to receive Revenues, which together with other available amounts, will be sufficient to place the System on a self-sustaining basis. All Revenues of the System are deposited by the Board in the Local Water Fund held by the Board. The Authority holds a statutory first lien on the Revenues for the payment of all amounts due to the Authority under the Agreement. In the event that the Board fails to make any required payment to the Authority, the Authority or the Trustee may petition for the appointment, by any court having jurisdiction, of a receiver to administer the affairs of the Board, and, with court approval, establish rates and charges to provide Revenues sufficient to make required payments. However, no holder or owner of any bond or note issued by the Authority, or any receiver of the System, may compel the sale of any part of the System.

The City has covenanted in the Agreement to operate and maintain the System in accordance with the advice and recommendations of the Consulting Engineer. Such obligation to operate and maintain the System may be enforced by the Authority in accordance with the provisions of the Act and the terms of the Agreement and the Lease. The amounts required to operate and maintain the System are certified to the Board by the City and reviewed by the Consulting Engineer.

Beginning on the first day of each month the Board is required to pay to the Trustee under the Resolution the Revenues in the Local Water Fund, for deposit in the Revenue Fund established under the Resolution until the amount so deposited equals the Minimum Monthly Balance and the Required Deposits for such month. The Minimum Monthly Balance is the amount required to provide for timely payment of all debt service on Outstanding Bonds. Required Deposits are the amounts required to be paid from Revenues for deposit to the Authority Expense Fund, the Debt Service Reserve Fund and the Subordinated Indebtedness Fund, including amounts required for payment of the Second Resolution Bonds and other subordinate debt. See "APPENDIX C—GLOSSARY AND SUMMARY OF CERTAIN DOCUMENTS—Summary of the Agreement—Minimum Monthly Balance".

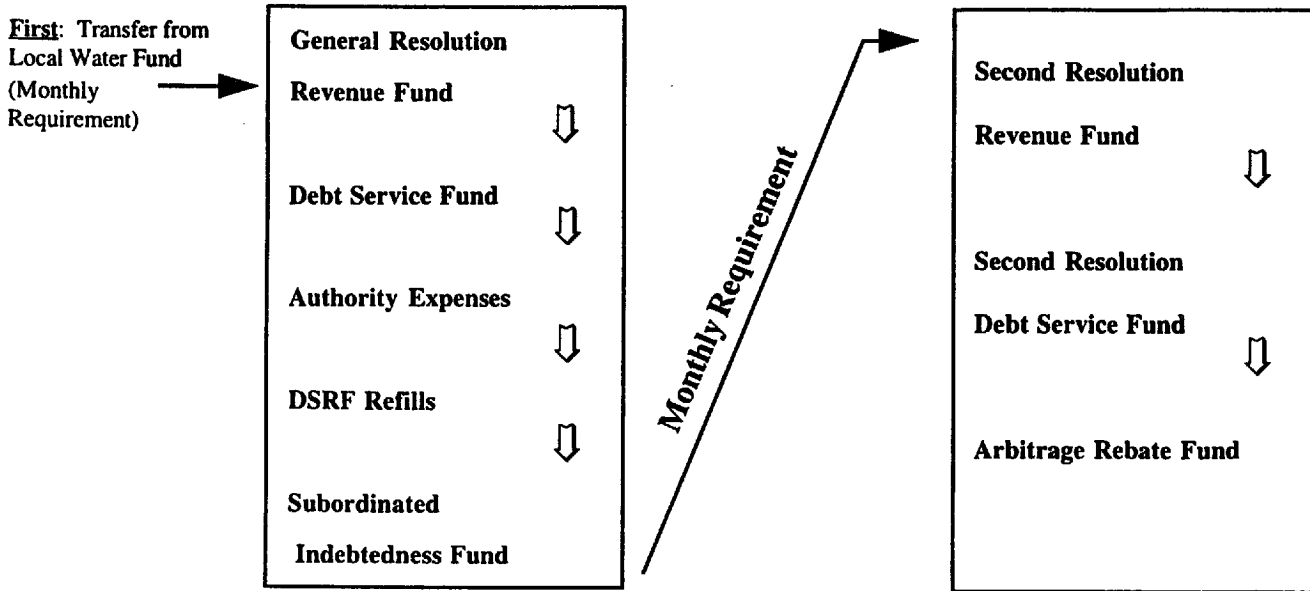
Amounts on deposit in the Revenue Fund are required to be paid to the following funds established under the Resolution in the following order of priority: first, to the Debt Service Fund; second, to the Authority Expense Fund; third, to the Debt Service Reserve Fund to replenish any deficiency therein; and fourth, to the Subordinated Indebtedness Fund. If amounts on deposit in such Debt Service Fund or such Debt Service Reserve Fund are less than the requirements thereof, amounts on deposit in the Subordinated Indebtedness Fund are required to be used to make up such deficiency. See "APPENDIX C—GLOSSARY AND SUMMARY OF CERTAIN DOCUMENTS—Summary of the Resolution—Payments into Certain Funds".

After making such deposits to the Revenue Fund in such month the Board, from the balance remaining in the Local Water Fund, is required, after paying monthly Board Expenses, to pay the City 1/12th of the operating expenses for such Fiscal Year. After making such payments, any amounts remaining in the Local Water Fund in each month are paid proportionately, (a) to the Trustee for deposit in the Revenue Fund until the total of all amounts deposited in the Revenue Fund equals the Cash Flow Requirement for such Fiscal Year and (b) to the City until all amounts required to be paid to the City for Operating Expenses for such Fiscal Year have been paid. For a more complete description of the required payments from the Local Water Fund, see "APPENDIX C—GLOSSARY AND SUMMARY OF CERTAIN DOCUMENTS—Summary of the Resolution" and "Summary of the Agreement".

The Fiscal 1998 B Bonds will be on a parity with the currently Outstanding Bonds and with Bonds hereafter issued and are payable from and secured by a pledge of (i) all Revenues, (ii) all moneys or securities in any of the Funds and Accounts established under the Resolutions, and (iii) all other moneys and securities to be received, held or set aside pursuant to the Resolution, subject only to the provisions of the Resolution and the Agreement permitting the application thereof for the purposes and on the terms and conditions set forth therein, including the making of any required payments to the United States with respect to arbitrage earnings. See "APPENDIX C—GLOSSARY AND SUMMARY OF CERTAIN DOCUMENTS—Summary of the Resolution" and "Summary of the Agreement".

Pursuant to the Agreement, the Resolution and the Second Resolution, the Revenues received by the Board will be applied in the manner set forth in the following chart. The information contained in such chart is qualified by reference to the Agreement, the Resolution and the Second Resolution.

# Consolidated Flow of Funds



**Second:** Daily transfer from Local Water Fund (Monthly Requirement)

→ • Water Board Expenses

**Third:** Daily transfer from Local Water Fund (Monthly Requirement)

→ • System Operating and Maintenance

**Fourth:** Daily transfer from Local Water Fund (Up to Annual Requirement)

→ Pro rata to:

- General Resolution Revenue Fund: (for annual Debt Service, Authority expenses, DSRF, Subordinate Indebtedness (Second Resolution))
- System Operations and Maintenance

**Fifth - Seventh:** Daily transfer from Local Water Fund Debt Service is set aside; typically funded during the last few months of the fiscal year

→ • City lease payment, operating and maintenance (After reserve replenishment, surplus including pay as you go capital)

### **Debt Service Reserve Fund**

The Resolution establishes a Debt Service Reserve Fund and requires as a condition to the issuance of each Series of Bonds that there be deposited into the Debt Service Reserve Fund the amount, if any, necessary to make the amount on deposit therein equal to the Debt Service Reserve Requirement, after giving effect to the issuance of such Bonds. The Debt Service Reserve Requirement is an amount equal to maximum annual Adjusted Aggregate Debt Service in the then current or any future Fiscal Year on all Bonds Outstanding. Amounts on deposit in the Debt Service Reserve Fund will be applied, to the extent Revenues are not available, to pay Principal Installments and interest on the Bonds. See "APPENDIX C—GLOSSARY AND SUMMARY OF CERTAIN DOCUMENTS—Summary of the Resolution—Debt Service Reserve Fund".

In lieu of making cash deposits to the Debt Service Reserve Fund, the Authority may satisfy the Debt Service Reserve Requirement by depositing Financial Guaranties into the Debt Service Reserve Fund. See "APPENDIX C—GLOSSARY AND SUMMARY OF CERTAIN DOCUMENTS—Summary of the Resolution—Debt Service Reserve Fund".

On June 30, 1997, the market value of the securities in the Debt Service Reserve Fund was in excess of the Debt Service Reserve Fund Requirement, which was approximately \$496.1 million as of such date. Upon the delivery of the Fiscal 1998 B Bonds, the Debt Service Reserve Fund will be funded in an amount at least equal to the maximum annual Adjusted Aggregate Debt Service on the Bonds.

### **Rate Covenant**

The Board has covenanted in the Agreement to establish, fix, revise and collect rates, fees and charges for the use of, or the services furnished by the System, adequate, together with other available funds, to provide for (i) the timely payment of Principal Installments of and interest on all Bonds, and the principal of and interest on any other indebtedness of the Authority (which includes Second Resolution Bonds and other subordinate debt) payable from Revenues, (ii) the proper operation and maintenance of the System, (iii) all other payments required for the System not otherwise provided for, and (iv) all other payments required pursuant to the Agreement and the Lease.

Without limiting the generality of the foregoing, the Board has covenanted to establish and collect rates, fees and charges sufficient in each Fiscal Year so that Revenues collected in such Fiscal Year will be at least equal to the sum of (i) 115% of Aggregate Debt Service and Projected Debt Service on all Bonds (excluding Refundable Principal Installments that are payable from funds held in trust therefor) payable in such Fiscal Year, and (ii) 100% of the Operating Expenses and Required Deposits (including debt service on Second Resolution Bonds and other subordinate debt) required to be paid from Revenues for such Fiscal Year (the "Rate Covenant"). Amounts on deposit in the Revenue Fund on July 1 of a Fiscal Year will reduce the amount of Revenues required to be raised to meet the Required Deposits for such Fiscal Year. A failure to generate Revenues as set forth in this paragraph will not constitute an "event of default" under the Agreement if the Board takes timely action to correct any such deficiency as described in the following paragraph.

Under the Resolution and the Second Resolution, the Authority is required to submit to the Board by May 1 of each year the Authority Budget for the ensuing Fiscal Year showing the itemized estimated Cash Flow Requirement for such Fiscal Year. At the beginning of each month, the Authority is to recalculate the Cash Flow Requirement for the then current Fiscal Year and to submit it and any revisions to the Authority Budget required as a consequence. The Authority Budget and Cash Flow Requirement are to be used by the Board to set rates, fees and charges.

The Board has covenanted in the Agreement to review the adequacy of rates, fees and charges at least annually. If such annual review, or the report of the Rate Consultant required pursuant to the Agreement, indicates that the rates, fees and charges are or will be insufficient to meet the requirements of the rate covenant described above, the Board will promptly take the necessary action to cure or avoid any such deficiency. In

addition, under the Agreement, the City, which is responsible for billing, collecting and enforcing collections of rates and charges established by the Board, has agreed that it will diligently pursue all actions necessary to cure or avoid any such deficiency.

The Board has covenanted in the Agreement that it will not furnish or supply or cause to be furnished or supplied any product, use or service of the System free of charge or at a nominal charge, and will enforce (or cause the City to enforce) the payment of any and all amounts owing to the Board for use of the System, except to the extent required by the Act, as in effect on July 24, 1984.

### **Additional Bonds**

The Authority may issue additional Bonds to pay for capital improvements to the System, to pay or provide for the payment of Bonds, Second Resolution Bonds and bond anticipation notes, including commercial paper notes, to refund general obligation bonds of the City issued for water or sewer purposes and to fund certain reserves. Under the Resolution, additional Bonds may be issued only upon satisfaction of certain requirements, including receipt by the Trustee of:

(a) a certificate by an Authorized Representative of the Authority to the effect that the Revenues for either of the last two Fiscal Years immediately preceding the Fiscal Year in which such Bonds are to be issued were at least equal to the sum of (i) 115% of the Aggregate Debt Service during such Fiscal Year (excluding from Aggregate Debt Service any Principal Installments, or portion thereof, paid from a source other than Revenues), and (ii) 100% of the sum of the Operating Expenses of the System certified by the City and the Required Deposits for such Fiscal Year, and

(b) a certificate of the Rate Consultant to the effect that the estimated Revenues for each of the five Fiscal Years following the issuance of such Series of Bonds (plus the Fiscal Year in which such Bonds are issued) after giving effect to any increases or decreases in rates, fees and charges projected for such Fiscal Years will be at least equal to the sum of (i) 115% of the maximum estimated Adjusted Aggregate Debt Service on all Bonds then Outstanding including the Bonds to be issued, and (ii) 100% of the sum of the projected Operating Expenses and Required Deposits for such Fiscal Years.

The Authority may issue additional Bonds for the purpose of refunding Outstanding Bonds without satisfaction of the requirements described above only if:

(a) the average annual debt service on the refunding Bonds does not exceed the average annual debt service on the Bonds to be refunded, and

(b) the maximum debt service in any Fiscal Year on the refunding Bonds does not exceed the maximum debt service in any Fiscal Year on the Bonds to be refunded.

See "APPENDIX C—GLOSSARY AND SUMMARY OF CERTAIN DOCUMENTS—Summary of the Resolution".

### **Authority Debt**

At the date of this Official Statement, the Authority had approximately \$6.56 billion aggregate principal amount of Outstanding Bonds (Capital Appreciation Bonds are included at their accreted value as of September 1, 1997). In addition, at the date of this Official Statement, the Authority had approximately \$1.06 billion aggregate principal amount of outstanding Second Resolution Bonds and \$600 million aggregate principal amount of outstanding commercial paper notes consisting of \$200 million of Series One Notes, \$100 million of Series Three Notes (the "Series Three Notes"), \$100 million of Series Four Notes (the "Series Four Notes") and \$200 million of Series Five Notes. A portion of the proceeds of the Fiscal 1998 B Bonds will be applied to reimburse the Letter of Credit Banks for moneys drawn under their respective irrevocable letters of credit to provide for the payment of principal of and interest on all of the outstanding Series One Notes and Series Five Notes. The Authority intends to issue new Series One Notes and Series Five Notes to increase to \$600 million the aggregate amount of Commercial Paper Notes Outstanding in Fiscal Year 1998.

Second Resolution Bonds are payable from, among other sources, and secured by, a pledge of amounts on deposit in the Subordinated Indebtedness Fund, subject to the first lien on such amounts in favor of the Bonds. Amounts on deposit in the Subordinated Indebtedness Fund will be available, to the extent not utilized for Bonds, to pay debt service on Second Resolution Bonds.

The Commercial Paper Notes are special obligations of the Authority payable from moneys derived from irrevocable, direct pay letters of credit. Interest on the Commercial Paper Notes is secured by the Revenues of the System and the moneys and investments from time to time on deposit in the Subordinated Indebtedness Fund and the funds and accounts established under the resolutions authorizing their issuance. The pledge of the Revenues and the moneys and investments from time to time on deposit in the Subordinated Indebtedness Fund is subject and subordinate to the pledge thereof made by the Resolution for the benefit of the holders of Bonds. However, the pledge of the moneys and investments on deposit in the Subordinated Indebtedness Fund securing Commercial Paper Notes is of equal priority with the pledge securing Second Resolution Bonds.

The Authority's obligations to reimburse the banks for moneys advanced by them pursuant to the letters of credit, and to pay interest on the moneys advanced are secured by a pledge of the moneys and investments on deposit in the Subordinated Indebtedness Fund on a parity with the pledge to secure the Second Resolution Bonds. Interest is also secured by a pledge of Revenues which is subordinate to the pledge securing the Bonds.

#### **Covenant of the State**

Section 1045-t of the Act constitutes a pledge of the State to the holders of Bonds not to limit or alter the rights vested in the Authority or the Board by the Act to fulfill the terms of any agreement made with or for the benefit of the holders of the Bonds until such obligations together with the interest thereon are fully met and discharged.

### **THE AUTHORITY**

#### **Purpose and Powers**

The New York City Municipal Water Finance Authority is a public benefit corporation created pursuant to the Act. Among its powers under the Act, the Authority may borrow money, issue debt and enter into the Agreement, and refund its bonds and notes and general obligation bonds of the City issued for water or sewer purposes. Additionally, the Authority has the power to require that the Board charge and collect sufficient rates to pay the costs of operating and financing the System and to enforce the obligation of the City adequately to operate and maintain the System.

Pursuant to the Act, there is a statutory first lien upon the Revenues in favor of the payment of all amounts due to the Authority under the Agreement. The Revenues remain subject to this lien until provision for payment of all indebtedness issued by the Authority has been made.

#### **Membership**

The Act authorizes a seven-member board to administer the Authority. Four of the members of the Board of Directors are designated in the Act as ex officio members: the Commissioner of Environmental Protection of the City, the Director of Management and Budget of the City, the Commissioner of Finance of the City and the Commissioner of Environmental Conservation of the State. Of the three remaining public members, two are appointed by the Mayor and one is appointed by the Governor. The public members have terms of two years. Pursuant to the Act, all members continue to hold office until their successors are appointed and qualified.

The current members of the Board of Directors are:

<u>Member</u>	<u>Occupation</u>	<u>Term Expires</u>
Adam L. Barsky .....	Acting Commissioner of Finance of the City	<i>ex officio</i>
Joseph J. Lhota .....	Director of Management and Budget of the City	<i>ex officio</i>
Joel A. Miele, Sr., P.E. ....	Commissioner of Environmental Protection of the City	<i>ex officio</i>
John P. Cahill .....	Commissioner of Environmental Conservation of the State	<i>ex officio</i>
Charles E. Dorkey III* .....	Partner, Haythe & Curley	December 1997
Arthur B. Hill** .....	United Parcel Service, Retired	December 1997
James P. Stuckey* .....	Senior Vice President and Director of Commercial Development, Forest City Ratner Companies	December 1996

\* Appointed by the Mayor.

\*\* Appointed by the Governor.

The following is a brief description of the staff members of the Authority:

**Mark Page, Executive Director**

Mr. Page was appointed Acting Executive Director in December 1984 and Executive Director in October 1985. Mr. Page also serves as the Deputy Director and General Counsel of the Office of Management and Budget of the City. Mr. Page has worked for the City since 1978 and has served as Assistant General Counsel of the Office of Management and Budget. Mr. Page is a graduate of Harvard University and New York University School of Law.

**Alan Anders, Treasurer**

Mr. Anders was appointed Treasurer in October 1990. Mr. Anders also serves as Director of Financing Policy and Coordination for the Office of Management and Budget of the City. Prior to joining the Authority and the City in September 1990, Mr. Anders was a senior investment banker for J. P. Morgan Securities since 1977 and prior to that date was Executive Director of the Commission on Governmental Efficiency and Economy in Baltimore, Maryland. Mr. Anders is a graduate of the University of Pennsylvania and the University of Maryland Law School.

**Marjorie E. Henning, Secretary**

Ms. Henning was appointed Secretary in November 1993. Ms. Henning also serves as Counsel to the Office of Management and Budget of the City. Ms. Henning is a graduate of the State University of New York at Buffalo and the Harvard Law School.

**Valerie Mehallow, Comptroller**

Ms. Mehallow was appointed Comptroller in September 1994. Ms. Mehallow is a Certified Public Accountant and is a graduate of the Pennsylvania State University and the Columbia University School of Business.

**Patrick J. McCoy, Manager of Investor Relations**

Mr. McCoy was appointed Manager of Investor Relations in April 1994. Mr. McCoy is a graduate of St. Ambrose University and the New School for Social Research.

## THE BOARD

### Purpose and Powers

The Board is a public benefit corporation of the State created by Chapter 515 of the Laws of 1984. The primary responsibility of the Board is to fix, revise, charge, collect and enforce rates and other charges for the System.

The Board is required under the Act to establish rates that will provide adequate funds to pay the debt service on outstanding Authority indebtedness and the City's cost of operating and maintaining the System. In each Fiscal Year, any amounts remaining in the Local Water Fund, after making the required payments under the Agreement, shall be deposited in the General Account in the Operation and Maintenance Reserve Fund and shall be available either as a source of funding for System expenditures or upon certification of the City for deposit to the Authority's Construction Fund to pay for the costs of System capital projects. See "APPENDIX C—GLOSSARY AND SUMMARY OF CERTAIN DOCUMENTS—Summary of the Agreement—Application of Moneys in the Operation and Maintenance Reserve Fund".

Pursuant to the Lease, the Board has a leasehold interest in the System with a term of 40 years from July 1, 1985, or until all Bonds or other obligations issued by the Authority are paid in full or provision for payment has been made, whichever is later. Under the Lease, the City will provide billing, collection, enforcement and legal services to the Board. The Board is required to compensate the City for the cost of these services.

### Membership

The Board consists of seven members who are appointed by the Mayor for terms of two years. The Act also provides that at least one member will have experience in the science of water resource development and that no member of the Board will be a member of the Authority. The Chairman is appointed by the Mayor. Pursuant to the Act, all members continue to hold office until their successors are appointed and qualified.

The current members of the Board are:

<u>Member</u>	<u>Occupation</u>	<u>Term Expires</u>
Mark R. Hellerer, Chairman .....	Counsel, Winthrop, Stimson, Putnam & Roberts	June 1997
Edward Brodsky .....	Partner, Proskauer Rose LLP	June 1998
Susan Millington Campbell .....	Partner, Hughes Hubbard & Reed LLP	June 1998
Leroy Carmichael .....	Executive Director, Bronx Psychiatric Center	June 1996
Amaziah Howell .....	President, Howell Petroleum Products, Inc.	June 1998
David B. Rosenauer .....	Partner, Gibson Dunn & Crutcher	June 1997
James T.B. Tripp .....	General Counsel, Environmental Defense Fund	June 1995

The following is a brief description of the staff members of the Board:

Diana Chapin, Ph.D., Executive Director

Ms. Chapin was appointed Executive Director of the Board in October 1996 and First Deputy Commissioner of DEP in August 1996. She began her career in City government in 1978, most recently as Deputy Commissioner for Policy and Administration at the Department of Buildings, where she chaired the



Plumbing Board and coordinated the One Stop Permitting Program. Prior to that, she was the Deputy Commissioner in charge of Planning, Revenue and Capital Projects at the Department of Parks and Recreation. Ms. Chapin is a graduate of the University of Michigan, and received a Ph.D. from Cornell University where she was both a Woodrow Wilson Fellow and a Dissertation Fellow.

**William Kusterbeck, Treasurer**

Mr. Kusterbeck was appointed Acting Treasurer in June 1985 and Treasurer in November 1985. Mr. Kusterbeck has worked for DEP since 1979. He has served in various positions in DEP including Director of Rates and Revenue, and Director of the Office of Planning. Mr. Kusterbeck is a graduate of Hunter College of the City University of New York and Columbia University Graduate School of Business.

**Jack Serrano, Deputy Treasurer**

Mr. Serrano was appointed Deputy Treasurer in May 1991. He also serves as the Deputy Director of Rates and Revenues of DEP. Mr. Serrano has worked for the City and DEP since 1987 and has served as the Director of DEP's Audit Implementation and Analysis Group. Prior to joining the City, Mr. Serrano worked with the American Telephone & Telegraph Company as District Manager, Financial Analysis. Mr. Serrano is a graduate of Pace University.

**Albert F. Moncure, Jr., Secretary**

Mr. Moncure was named Acting Secretary in February 1997 and Secretary in April 1997. Mr. Moncure also serves as Chief of the Municipal Finance Division of the New York City Law Department. Mr. Moncure has worked for the Law Department since 1986. Mr. Moncure is a graduate of Dartmouth College and the Yale Law School.

**THE DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**Organization.** The following table sets forth the seven DEP bureaus relating to the System, their staffing levels for Fiscal Year 1998 and major responsibilities.

**Organization of DEP**

<u>Bureau</u>	<u>System Staff</u>	<u>Major Responsibilities</u>
Customer and Conservation Services .....	620	Administration of water conservation programs, billings, collections and customer services, enforcement of water use activities, and management of universal metering program
Water and Sewer Operations .....	1,248	Water supply and sewage collection system planning, design, construction supervision, operation, maintenance and repair
Water Supply Quality and Protection .....	854	Management of upstate watershed, implementation of watershed agreement and insuring quality of New York City's water supply
Environmental Engineering .....	456	Design, construction supervision of large capital projects, including water tunnel and sewage treatment upgrades
Wastewater Pollution Control .....	1,951	Wastewater treatment plant planning, design, construction supervision, operation, maintenance and repair

<u>Bureau</u>	<u>System Staff</u>	<u>Major Responsibilities</u>
Management and Budget .....	327	Administration of personnel and fiscal services, vehicle fleet and building analysis, labor relations and management analysis
Executive .....	168	Executive management, public affairs and intergovernmental relations, engineering audit, engineering services and legal counsel
Total .....	<u>5,624</u>	

Approximately 1,280 people within the System staff are assigned to the design and construction of ongoing capital projects, including projects within the Capital Improvement Program, as hereinafter defined, and 426 provide administrative and support services to both System and non-System staff. There are an additional 372 employees within the DEP staff whose duties are not related to water and sewer service and whose cost is not included as a System cost.

The New York City Department of Design and Construction (the "DDC") has taken over responsibility for the construction and reconstruction of water and sewer mains in the City from DEP. Based upon current workloads, a proportion of DDC's staff equivalent to 450 full-time positions are devoted to DEP construction projects.

To help the City meet its environmental mandates, refine its priorities and establish appropriate program levels while maintaining affordable water and sewer rates, DEP has undertaken a comprehensive strategic planning process. DEP has now completed the first stages of a more focused and cost-effective program to improve services to the public.

DEP is managed by a Commissioner who is appointed by the Mayor. Each of the five operating Bureaus (the Bureaus of Customer and Conservation Services, Water and Sewer Operations, Water Supply, Quality and Protection, Environmental Engineering and Wastewater Pollution Control) reports to the Commissioner through the First Deputy Commissioner and is directly supervised by a Deputy Commissioner.

The following are brief descriptions of certain management personnel responsible for the operation of the System.

**Joel A. Miele, Sr., P.E., Commissioner**

Mr. Miele was appointed Commissioner in August 1996. A graduate of the Polytechnic Institute of New York, Mr. Miele is a Professional Engineer with more than thirty-five years of experience, most recently as Commissioner of the Department of Buildings. Mr. Miele enlisted in the U.S. Navy in 1957, and remained active in the reserve of the Civil Engineer Corps until his retirement in 1988 with the rank of Captain and the title of Commodore. Except for active duty with the Navy, he was employed as a design engineer in the firm of Yudell and Miele from 1955 through 1965, and was later a founding partner in the successor firm of Miele Associates. He served as a Commissioner of the City Planning Commission from 1990 to 1994.

**Diana Chapin, Ph.D., First Deputy Commissioner**

Ms. Chapin was appointed First Deputy Commissioner of DEP in August 1996 and Executive Director of the Board in October 1996. She began her career in City government in 1978, most recently as Deputy Commissioner for Policy and Administration at the Department of Buildings, where she chaired the Plumbing Board and coordinated the One Stop Permitting Program. Prior to that, she was the Deputy Commissioner in charge of Planning, Revenue and Capital Projects at the Department of Parks and Recreation. Ms. Chapin is a graduate of the University of Michigan, and received a Ph.D. from Cornell University where she was both a Woodrow Wilson Fellow and a Dissertation Fellow.

Lawrence E. Schatt, Deputy Commissioner

Mr. Schatt was appointed Deputy Commissioner in September 1996, having served as the Acting Deputy Commissioner for Customer Service since May 1996. Prior to joining DEP, he was Executive Deputy Director for Agency Operations with the Mayor's Office of Operations, and from 1992 to 1995 he was the Assistant Commissioner for Code Enforcement at the Department of Housing Preservation and Development. Mr. Schatt has been in city government since 1968, and has served in numerous capacities with the Human Resources Administration. He has a degree in Business Administration from the Baruch School of Business and Public Administration of the City College of New York.

Douglas Stratton Greeley, P.E., Deputy Commissioner

Mr. Greeley was appointed Director of the Bureau of Water and Sewer Operations in 1996. He has been with the Department of Environmental Protection since 1973 and has served in numerous capacities, including Chief of System Operations, Chief of the Maintenance Division, and Chief of the Repairs Division of DEP's Bureau of Water Supply and Wastewater Collection. Mr. Greeley is a graduate of the Stevens Institute of Technology. He is a Professional Engineer.

William N. Stasiuk, P.E., Ph.D., Deputy Commissioner

Dr. Stasiuk was appointed Director of the Bureau of Water Supply, Quality and Protection in 1996. He joined DEP after a 34-year career with the New York State Department of Environmental Conservation and the New York State Department of Health ("NYSDOH"), most recently as Director of the Center for Environmental Health with NYSDOH. Dr. Stasiuk graduated from Manhattan College, received an M.E. (Sanitary) degree from Manhattan College, and a Ph.D. in Environmental Engineering from Rensselaer Polytechnic Institute. He is a Professional Engineer, and is an Associate Professor of the School of Public Health, at the State University of New York at Albany.

Robert Gaffoglio, P.E., Deputy Commissioner

Mr. Gaffoglio was appointed Director of the Bureau of Environmental Engineering in 1996. He has been with the Department of Environmental Protection since 1970, and has served as the Chief of the Division of Combined Sewer Overflow (CSO) Abatement, Deputy Director for Sewer Design, and most recently as First Deputy Director of Environmental Engineering. Mr. Gaffoglio received a B.S. degree, an M.S. in Transportation Planning, and an M.S. in Management from the Polytechnic Institute of New York. He is a Professional Engineer.

Robert Adamski, P.E., Deputy Commissioner

Mr. Adamski was appointed Director of the Bureau of Wastewater Pollution Control in 1996. He has served in numerous capacities with DEP, NYSDEC and the Brooklyn Borough President since 1968. At DEP he has served as the Director of Natural Resources and as the Deputy Director of the Bureau of Environmental Engineering. Mr. Adamski is a graduate of the College of the City of New York with a degree in Civil Engineering and is a Professional Engineer.

## **Labor Relations**

During the last decade, there have been no strikes or major work stoppages of DEP employees affecting the System.

Approximately 5,500 of DEP's 6,000 active employees are members of labor unions which represent such employees in collective bargaining with the City. This includes approximately 2,000 laborers, mechanics, and workers in other crafts governed by the provisions of Section 220 of the State Labor Law. The salary levels of these employees are decided pursuant to the determination of the City's Comptroller as to "prevailing rates". The approximately 2,000 DEP employees represented by District Council 37, American Federation of State, County and Municipal Employees, the approximately 350 employees represented by the Communications Workers of America and the approximately 250 employees represented by Local 237 of the International Brotherhood of Teamsters were part of a coalition of municipal unions that reached a collective bargaining settlement with the City which included as a component thereof a total net expenditure increase of 13% over present costs. District Council 37 and Local 237 have ratified the proposed settlement.

There are approximately 500 DEP employees holding management or "original jurisdiction" positions who are not members of unions and are not covered by Labor Law Section 220, but do receive comparable benefits.

## CAPITAL IMPROVEMENT AND FINANCING PROGRAM

### Capital Improvement Program

In May 1997, the City published its Ten Year Capital Strategy (Fiscal Years 1998-2007) (the "Ten Year Capital Strategy"), which provides for the rebuilding of the City's infrastructure and which includes a Capital Improvement Program for the System for the Fiscal Years 1998 through 2007 (the "CIP"). The CIP includes projected expenditures of \$8.61 billion for water and sewer facilities.

The CIP presented in the following table entitled "Capital Improvement Program" reflects a review of the present condition and long-term needs of the plant and equipment constituting the System. The CIP incorporates the requirements of legal mandates, the present replacement cycle for these facilities, extensions to the present service area, and programs to enhance and optimize the operation of the System. Allowances are included in the CIP for emergency repair and replacement. An annual allowance for escalation in cost due to inflation of approximately 4% has been included, using 1997 as the base year.

On January 21, 1997, the City and the State executed a watershed memorandum of agreement (the "Memorandum of Agreement") with the communities in the City's watershed region, the United States Environmental Protection Agency ("USEPA") and several environmental groups. The Memorandum of Agreement supplements the City's existing watershed protection program with approximately \$400 million in additional funding which is fully funded in DEP's capital and expense budgets. The CIP reflects these additional amounts.

The CIP presents the maximum authorized levels of work. The actual work done in any given year will differ from that outlined in the CIP. Projections contained in the CIP concerning routine replacement and extension work on the System and its components are likely to vary from actual performance. Generally, work occurs more slowly in aggregate than originally projected. Timing of this work is not critical to the welfare of the System. Works projected in the CIP substantially exceed those levels required in order to maintain the currently top-rated condition of the System.

The CIP was evaluated independently by Metcalf & Eddy. Metcalf & Eddy concluded that the CIP is comprehensive and responsive to the long-term needs of the operation of the System. See "APPENDIX A—LETTER OF METCALF & EDDY, CONSULTING ENGINEERS".

### Capital Improvement Program

(Thousands of Dollars)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	TOTAL
<b>SYSTEM FUNDS</b>											
<b>WATER SUPPLY AND TRANSMISSION</b>											
City Tunnel No. 3, Stage 1	\$ 39,505	\$ 0	\$ 119,300	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 0	\$ 158,805
City Tunnel No. 3, Stage 2	6,000	80,000	199,060	117,000	315,000	0	0	0	0	0	717,060
Miscellaneous Programs	2,036	0	0	0	0	0	0	0	0	0	2,036
Reconstruction of Tunnel No. 1	0	0	0	0	0	0	0	0	10,000	0	10,000
Subtotal	47,541	80,000	318,360	117,000	315,000	0	0	0	10,000	0	887,901
<b>WATER DISTRIBUTION</b>											
Trunk & Distribution Main Replacement	126,648	64,729	37,310	35,679	28,124	33,111	27,307	26,996	26,000	26,000	431,904
Trunk & Distribution Main Extension	18,900	23,000	16,000	91,147	16,000	16,000	16,000	16,000	3,500	3,500	220,047
Croton Filtration Project	0	3,000	0	0	325,000	250,000	250,000	0	0	0	828,000
Dam Safety Program	45,600	26,250	9,350	126,350	0	0	0	0	0	0	207,550
Water Quality Preservation	131,851	134,448	51,250	31,625	10,000	10,000	10,000	10,000	12,265	0	401,439
Augmentation of Water Supply Systems	0	0	0	0	0	0	0	0	0	0	0
Corrosion Protection System	0	0	0	0	0	0	0	0	2,300	0	2,300
Mapping & Telemetry	0	0	0	0	0	0	0	0	2,800	0	2,800
Subtotal	322,999	251,427	113,910	284,801	379,124	309,111	303,307	52,996	46,865	29,500	2,094,040
<b>WATER POLLUTION CONTROL</b>											
Consent Decree Upgrading & Construction	138,420	133,700	257,000	311,000	257,000	148,000	40,000	0	0	0	1,285,120
Water Quality Mandates	173,800	220,342	427,500	183,500	193,000	145,000	46,000	40,000	40,000	35,000	1,504,142
Plant Upgrading & Reconstruction	116,035	100,490	112,230	28,730	28,130	29,630	28,130	29,630	25,630	25,630	524,265
Plant Component Stabilization	117,247	184,200	7,000	96,250	0	40,000	106,000	0	0	0	550,697
Biological Nutrient Removal	2,589	2,000	2,000	25,000	25,000	0	0	0	25,000	25,000	106,589
Sludge Disposal	46,131	0	0	0	0	0	2,000	0	0	0	48,131
Subtotal	530,372	590,732	805,730	644,480	503,130	362,630	222,130	69,630	90,630	85,630	4,018,944
<b>SEWERS</b>											
Replacement of Chronically Failing Components	99,324	42,275	56,450	58,825	65,135	61,820	78,229	72,585	73,940	69,090	677,673
Programmatic Replacement and Reconstruction	6,900	8,694	4,563	7,629	4,900	5,000	5,200	5,200	3,200	3,200	54,486
Programmatic Response to Regulatory Mandates	0	9,000	0	0	0	0	0	0	0	0	9,000
Replacement or Augmentation of Existing Systems	10,708	11,216	0	0	21,952	13,415	8,200	0	11,000	0	76,491
Extensions to Accommodate New Development	88,106	57,799	67,409	59,380	33,652	27,220	46,600	48,120	58,200	27,800	514,286
Subtotal	205,038	128,984	128,422	125,834	125,639	107,455	138,229	125,905	146,340	100,090	1,331,936
<b>EQUIPMENT</b>											
Vehicles & Equipment	5,996	4,492	1,563	1,639	2,200	2,200	1,000	1,000	0	0	20,090
Facility Purchases & Reconstruction	19,955	32,819	2,275	0	0	0	0	0	0	0	55,049
Management Information Systems	3,094	1,350	1,400	1,400	1,450	1,464	1,500	1,500	0	0	13,158
Utility Relocation for Sewer and Water Main Projects	15,250	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	10,000	105,250
Plumbing Retrofit Program	0	0	0	0	0	0	0	0	0	0	0
Installation of Water Meters	27,607	29,565	4,223	4,223	4,223	4,223	4,223	4,223	4,223	0	86,733
Subtotal	71,902	78,226	19,461	17,262	17,873	17,887	16,723	16,723	14,223	10,000	280,280
<b>TOTAL FUNDS</b>	<b>\$1,241,702</b>	<b>\$1,179,369</b>	<b>\$1,385,883</b>	<b>\$1,189,377</b>	<b>\$1,340,766</b>	<b>\$797,083</b>	<b>\$680,389</b>	<b>\$265,254</b>	<b>\$308,058</b>	<b>\$225,220</b>	<b>\$8,613,101</b>
Total System Funds	1,177,852	1,129,369	1,385,883	1,189,377	1,340,766	797,083	680,389	265,254	308,058	225,220	8,499,251
Total Non-System Funds	63,850	50,000	0	0	0	0	0	0	0	0	113,850

## Current Capital Plan

The following table entitled "1998-2001 Current Capital Plan" presents the Current Capital Plan, as revised in September 1997 for the System for Fiscal Year 1998 through Fiscal Year 2001 as evaluated by the firm of Metcalf & Eddy. See "APPENDIX A—LETTER OF METCALF & EDDY, CONSULTING ENGINEERS". While Black & Veatch, the Authority's rate consultant, has not performed a detailed independent review of the capital program elements and has not made an engineering evaluation of the System, Black & Veatch has concluded that the gross level of anticipated commitments appears to be reasonable compared to other large water and wastewater utilities. The level of commitments indicated include an allowance of approximately 4% per year for inflation.

### 1998-2001 CURRENT CAPITAL PLAN (Thousands of Dollars)

	1998	1999	2000	2001	TOTAL
<b>SYSTEM FUNDS</b>					
<b>WATER SUPPLY AND TRANSMISSION</b>					
City Tunnel No. 3, Stage 1 .....	\$ 32,163	\$ 12,600	\$ 119,300	\$ 0	\$ 164,063
City Tunnel No. 3, Stage 2 .....	3,236	82,000	199,060	117,000	401,296
Miscellaneous Programs .....	2,036	0	0	0	2,036
Subtotal .....	37,435	94,600	318,360	117,000	567,395
<b>WATER DISTRIBUTION</b>					
Trunk & Distribution Main Replacement .....	149,134	67,445	36,230	38,479	291,288
Trunk & Distribution Main Extension .....	26,210	23,000	16,127	91,147	156,484
Croton Filtration Project .....	150	3,000	0	0	3,150
Dam Safety Program .....	45,820	26,250	9,350	126,350	207,770
Water Quality Preservation .....	172,104	145,348	56,250	31,625	405,327
Subtotal .....	393,418	265,043	117,957	287,601	1,064,019
<b>WATER POLLUTION CONTROL</b>					
Consent Decree Upgrading & Construction .....	123,218	176,350	257,000	311,000	867,568
Water Quality Mandates .....	(603)	173,342	377,900	210,500	761,139
Plant Upgrading & Reconstruction .....	116,348	93,687	112,230	28,730	350,995
Plant Component Stabilization .....	100,467	189,200	89,500	96,250	475,417
Biological Nutrient Removal .....	8,761	3,980	2,000	0	14,741
Sludge Disposal .....	(16,260)	20,000	0	0	3,740
Subtotal .....	331,931	656,559	838,630	646,480	2,473,600
<b>SEWERS</b>					
Replacement of Chronically Failing Components .....	106,586	49,312	48,596	61,825	266,299
Programmatic Replacement and Reconstruction .....	9,423	0	11,694	9,192	30,309
Programmatic Response to Regulatory Mandates .....	0	9,000	0	0	9,000
Replacement or Augmentation of Existing Systems .....	14,624	8,994	4,857	476	28,951
Extensions to Accommodate New Development .....	90,933	79,842	63,649	63,380	297,804
Subtotal .....	221,546	147,148	128,796	134,873	632,363
<b>EQUIPMENT</b>					
Vehicles & Equipment .....	23,095	4,211	1,563	1,639	30,508
Facility Purchases & Reconstruction .....	29,646	32,819	2,375	0	64,840
Management Information Systems .....	9,983	1,350	1,400	1,400	14,133
Utility Relocation for Sewer and Water Main Projects .....	18,031	10,000	10,029	10,000	48,060
Plumbing Retrofit Program .....	0	0	0	0	0
Installation of Water Meters .....	73,312	29,565	4,223	4,223	111,323
Subtotal .....	154,067	77,945	19,590	17,262	268,864
<b>TOTAL SYSTEM FUNDS</b> .....	<b>1,138,397</b>	<b>1,241,295</b>	<b>1,423,333</b>	<b>1,203,216</b>	<b>5,006,241</b>
<b>STATE, FEDERAL AND PRIVATE FUNDS</b>					
Consent Decree Upgrading & Construction .....	1,536	0	0	0	1,536
Water Quality Mandates .....	60,000	50,000	0	0	110,000
Plant Component Stabilization .....	13	0	0	0	13
Subtotal .....	61,549	50,000	0	0	111,549
<b>TOTAL STATE, FEDERAL AND PRIVATE FUNDS</b> .....	<b>61,549</b>	<b>50,000</b>	<b>0</b>	<b>0</b>	<b>111,549</b>
<b>TOTAL FUNDS—ALL SOURCES</b> .....	<b>\$1,199,946</b>	<b>\$1,291,295</b>	<b>\$1,423,333</b>	<b>\$1,203,216</b>	<b>\$5,117,790</b>

### Comparison of the CIP and the Current Capital Plan

The differences between the Current Capital Plan and the CIP reflect a decrease of approximately \$2.3 million in the State and Federal funds and an increase of approximately \$123.8 million in System funds. The following table presents a comparison of the CIP and the Current Capital Plan.

#### COMPARISON OF 1998-2001 CURRENT PROJECTIONS (Thousands of Dollars)

	CIP 1998-2001	1998-2001 Current Capital Plan	Increased (Decrease)
<b>SYSTEM FUNDS</b>			
Water Supply and Transmission.....	\$ 562,901	\$ 567,395	\$ 4,494
Water Distribution .....	973,137	1,064,019	90,882
Water Pollution Control .....	2,571,314	2,473,600	(97,714)
Sewers .....	588,278	632,363	44,085
Equipment .....	186,851	268,864	82,013
Total .....	<u>\$4,882,481</u>	<u>\$5,006,241</u>	<u>\$123,760</u>
<b>STATE, FEDERAL &amp; PRIVATE FUNDS</b>			
Water Pollution Control .....	113,850	111,549	(2,301)
Total Funds—All Sources .....	<u>\$4,996,331</u>	<u>\$5,117,790</u>	<u>\$121,459</u>

The CIP presents the maximum authorized levels of work. The actual work done in any given year will differ from that outlined in the CIP. Likewise, actual forecasts of the capital program contained in the Current Capital Plan, since they are revised more frequently than the ten-year plan embodied in the CIP, have differed and will differ from those of the CIP. Projections contained in the CIP concerning routine replacement and extension work on the System and its components are likely to vary from actual performance. Generally, work occurs more slowly in aggregate than originally projected. Timing of this work is not critical to the welfare of the System. Works projected in the CIP substantially exceed those levels required in order to maintain the currently top-rated condition of the System.

Following is an explanation of items in the preceding tables under the caption "CAPITAL IMPROVEMENT PROGRAM".

#### *Water Supply and Transmission*

*Tunnel 3.* Stages I and II of Tunnel 3 include completion of the Brooklyn/Queens and Manhattan segments. Excavation of Stage I was completed in 1985. Stage I will be operational in 1998 and will improve the reliability of the transmission system. Completion of the Brooklyn/Queens segment of Stage II will improve services to Staten Island, Brooklyn and Queens. Construction of the Manhattan segment of Stage II will follow completion of the Brooklyn/Queens segment of Stage II. Stage II is scheduled to be completed in December, 2004. Tunnel 3 will create a more flexible system, providing delivery alternatives in the event of disruption in any of the Tunnels. It will permit the shutdown of tunnels for inspection and any necessary rehabilitation.

#### *Water Distribution*

*Croton Filter Project.* The City is a party to a 1992 stipulation with NYSDOH, providing for the construction of a full scale water treatment facility to filter Croton System water. See "THE SYSTEM—The Water System—Water Quality". The planning phase for the construction of such a facility is currently underway.

*Dam Safety Program.* Engineering reports sponsored by the U.S. Army Corps of Engineers indicated that the dams and reservoirs in service in the Croton System are safe but in need of rehabilitation and reconstruction. An ongoing dam reconstruction program has been established for rehabilitation of dams within the Croton watershed and the Kensico Dam.

### *Wastewater Pollution Control*

*Consent Decree Upgrading and Construction.* The Clean Water Act (as hereinafter defined) and the State Consent Decrees (as hereinafter defined) require construction of an intercepting sewer for one plant, and the upgrading of three plants. These projects are designed to improve the quality of the surrounding waters.

*Water Quality Mandates.* During periods of heavy rainfall, a combination of stormwater and sewage bypasses treatment and is released into the City's waterways. This program provides for the study, design and construction of the facilities necessary to control the polluting effects of such releases.

*Plant Upgrading and Reconstruction.* This program includes various projects undertaken to upgrade or reconstruct sewage pump stations, motor vessels, regulators and other components of the plant and treatment system.

*Plant Component Stabilization.* This program includes the replacement and reconstruction of failing components within the plants and their related facilities necessary to maintain process reliability. In some cases, this segment of the CIP provides for the replacement or rehabilitation of plant components required prior to comprehensive reconstruction at older plants which are not yet fully upgraded.

*Biological Nutrient Removal.* This program will provide for the retrofit of the 14 water pollution control plants to decrease the amount of nitrogen discharged.

### *Sewers*

*Replacement of Chronically Failing Components.* This program provides for the replacement of sewers which have already collapsed or experience chronic malfunctions (for example, sagging, bends or improper alignment) that cannot be overcome through maintenance or experience chronic malfunction due to inadequate capacity.

*Programmatic Replacement and Reconstruction.* Systematic replacement of sewers constructed with what are now considered to be substandard methods and materials or with materials that have exceeded their useful life has been undertaken. This will avoid more costly future repairs and will improve the general reliability of the System.

*Programmatic Response to Regulatory Mandates.* A program to address the mandated construction of new sewers required by the Clean Water Act has been established. This program is designed to eliminate the occasional discharge of untreated sewage.

*Replacement or Augmentation to Existing System.* The combined sewers must be large enough to convey a certain amount of both stormwater and sewage flow based on population density, industrial discharges and stormwater runoff in the sewered area. Some existing sewers fail to handle this flow adequately due to events occurring subsequent to their original design.

The sewer projects contained within this category will increase the capacity of these sewers to adequate levels through reconstruction, repair, replacement or diversion of flow into supplemental sewer pipe. Also included in this category are sewer projects which are undertaken primarily because other infrastructure projects make such sewer work desirable. These projects include the construction of sewers in conjunction with other utilities (such as water, gas and electric) road reconstruction and major land use changes.

*Extensions to Accommodate New Development.* The City must provide acceptable sewage disposal methods for residents within its jurisdiction and must therefore construct new sewers as required. The construction of sewers to replace septic tanks in populated areas avoids health problems associated with viruses, bacteria and other sewage-related pollutants and minimizes stormwater flooding.

### *Equipment*

*Utility Relocation for Sewers and Water Main Projects.* Under the City's cost-sharing agreement with gas utilities, the City is required to pay 51% of utility work required as a result of water main and sewer construction projects.



*Installation of Water Meters.* This includes the installation of water meters and other fixtures in order to more accurately measure water usage and encourage conservation.

### Historical Capital Program

The following table presents capital commitments and capital expenditures of the System for Fiscal Years 1993 through 1997. Capital commitments are contractual obligations entered into during the Fiscal Year while capital expenditures represent cash payments made during the Fiscal Year.

#### System Capital Commitments and Expenditures (Millions of Dollars)

	1993		1994		1995		1996		1997(3)	
	System Funds(1)	All Funds(2)	System Funds(1)	All Funds(2)	System Funds(1)	All Funds(2)	System Funds(1)	All Funds(2)	System Funds(1)	All Funds(2)
<b>Commitments</b>										
Water Supply .....	\$204	\$204	\$ 32	\$ 32	\$ 189	\$ 189	\$ 32	\$ 32	\$ 17	\$ 17
Water Mains .....	104	107	125	125	182	182	315	343	460	462
Sewer .....	81	81	124	124	145	145	126	126	166	166
Water Pollution Control ..	236	255	199	245	349	357	254	312	352	355
Equipment .....	21	21	111	111	151	151	182	182	185	185
Total .....	<u>\$646</u>	<u>\$668</u>	<u>\$591</u>	<u>\$637</u>	<u>\$1,016</u>	<u>\$1,024</u>	<u>\$909</u>	<u>\$ 995</u>	<u>\$1,180</u>	<u>\$1,185</u>
	1993		1994		1995		1996		1997(3)	
<b>Expenditures</b>	System Funds(1)	All Funds(2)	System Funds(1)	All Funds(2)	System Funds(1)	All Funds(2)	System Funds(1)	All Funds(2)	System Funds(1)	All Funds(2)
Water Supply .....	\$204	\$204	\$ 80	\$ 80	\$ 86	\$ 86	\$ 96	\$ 96	\$ 71	\$ 71
Water Mains .....	104	107	103	103	112	113	320	321	298	316
Sewer .....	81	81	118	118	120	120	126	126	163	163
Water Pollution Control ..	236	255	272	310	216	241	216	267	206	239
Equipment .....	—	—	43	43	87	87	196	196	189	189
Total .....	<u>\$625</u>	<u>\$647</u>	<u>\$616</u>	<u>\$654</u>	<u>\$ 621</u>	<u>\$ 647</u>	<u>\$954</u>	<u>\$1,006</u>	<u>\$ 927</u>	<u>\$ 978</u>

- (1) System Funds include the proceeds of Authority bonds sold directly to the public and those privately placed with the EFC under the revolving fund program.
- (2) All Funds include Federal and State capital grants.
- (3) Estimated.

### Financing Program

*Prior Financing.* Since the first issuance of bonds by the Authority in 1985, capital improvements to the System have been financed primarily with (1) proceeds of bonds sold directly to the public and privately placed with EFC in connection with the revolving loan fund program described below and (2) Federal and State capital grants. (See "Debt Service Requirements").

*Future Financing.* The Authority estimates that approximately 98% of the cost of the CIP, as revised by the Current Capital Plan, will be paid from System funds, primarily proceeds of bonds and other forms of indebtedness sold to the public and privately placed with EFC. For purposes of forecasting revenue requirements for the System, the principal amount of bonds estimated to be issued in Fiscal Years 1998 through 2003 is approximately \$1.0 billion per year. (See the table entitled "Sources and Uses of Capital Funds" under "CAPITAL IMPROVEMENT AND FINANCING PROGRAM").

Historically, Federal grant funds were provided pursuant to the Clean Water Act, in a program administered by the states, for construction and reconstruction of wastewater treatment facilities. The City is currently using these grant funds for five sewage treatment plants: Oakwood Beach, Coney Island, Owls Head, Red Hook and North River. The Clean Water Act currently requires states to use Federal funds in revolving loan programs in lieu of a Federal grant program for wastewater treatment facilities. To this end, a revolving loan program has been established by the State in order to utilize Federal financial assistance together with state matching grants

in a program to assist municipalities to construct eligible sewage facilities by providing subsidized loans. The Authority has previously participated in loans under the revolving loan program and anticipates further borrowing under the program. Revolving loan program funding is deemed System funds as it is obtained through the private placement of Authority bonds with EFC. (See "THE SYSTEM—Governmental Regulation—Wastewater Regulation"). Implementation of the CIP, as revised, is dependent upon the Authority's ability to market its securities successfully in the public credit markets. Sales of securities are subject to market conditions.

### Sources and Uses of Capital Funds

The following table presents the flow of funds in the Construction Fund of the System. The total proceeds from future issues of Bonds and Second Resolution Bonds are shown on Line 1 and the proceeds of short-term obligations are illustrated on Line 2. Lines 4 through 7 show the disposition of the proceeds. Lines 9 through 14 of the table indicate activity in the Construction Fund for each year of the reporting period.

#### Sources and Uses of Capital Funds (Thousands of Dollars)

Line No.	Description	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003	Period Total
	Disposition of Bond Proceeds							
1	Proceeds from Sale of Bonds ...	\$ 1,678,680	\$ 804,329	\$ 861,105	\$ 1,038,904	\$ 1,166,673	\$ 1,214,973	\$ 6,764,664
2	Proceeds from Short-Term Obligations .....	820,001	669,000	814,411	968,530	1,060,071	1,077,701	5,409,084
3	Total Proceeds .....	2,498,681	1,473,329	1,675,516	2,007,434	2,226,744	2,292,044	12,173,748
	Transfers							
4	Refunding of Prior Bonds (1) ...	785,640	--	--	--	--	--	785,640
5	Retirement of Short-Term Obligations .....	776,530	715,152	763,694	918,302	1,029,405	1,071,405	5,274,488
6	Construction Fund .....	820,001	669,000	814,411	968,530	1,060,701	1,077,701	5,409,084
7	Other (2) .....	116,510	89,177	97,411	120,602	137,268	143,568	704,536
8	Total Transfers .....	2,498,681	1,473,329	1,675,516	2,007,434	2,226,744	2,292,044	12,173,748
	Construction Fund							
9	Beginning Balance .....	533,462	456,463	461,463	472,874	486,404	499,475	533,462
10	Transfer from Bond Proceeds ...	820,001	669,000	814,411	968,530	1,060,071	1,077,701	5,409,084
11	Cash Financed Capital Improvements .....	35,000	35,000	25,000	25,000	25,000	20,000	165,000
12	Total Available .....	1,388,463	1,160,463	1,300,874	1,466,404	1,571,475	1,596,546	6,107,546
13	Less: Total Requirements (3) ...	(932,000)	(699,000)	(828,000)	(980,000)	(1,072,000)	(1,089,000)	(5,600,000)
14	Ending Balance .....	\$ 456,463	\$ 461,463	\$ 472,874	\$ 486,404	\$ 499,475	\$ 507,546	\$ 507,546

Notes:

- (1) The 1998 Series 3 Second Resolution Bonds will be exchanged for certain outstanding bonds.
- (2) Includes issuance costs, Debt Service Reserve Fund requirements and capitalized interest.
- (3) Cash requirements reflect commitments from current and prior years.

Totals may not add due to rounding.

Source: Black & Veatch

The following table shows expected debt service requirements including payments on outstanding bonds and on future bonds to be issued in financing the CIP.

**Future Debt Service Requirements**  
(Thousands of Dollars)

Line No.	Description	Bond Issue	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003
First Resolution Debt Service								
1	Outstanding Bonds(1) .....		\$406,303	\$401,779	\$392,062	\$405,915	\$421,094	\$423,880
2	Fiscal 1998 B Bonds .....		16,842	23,319	23,319	23,319	23,319	23,319
Anticipated Future Bond Issues								
3	Fiscal Year 1998 Bonds .....	\$ 200,000	—	20,663	13,491	13,491	13,491	13,491
4	Fiscal Year 1999 Bonds .....	614,329	—	11,811	67,513	48,848	48,848	48,848
5	Fiscal Year 2000 Bonds .....	681,105	—	—	9,356	77,598	53,951	53,951
6	Fiscal Year 2001 Bonds .....	858,904	—	—	—	12,768	97,330	71,221
7	Fiscal Year 2002 Bonds .....	986,673	—	—	—	—	16,180	110,833
8	Fiscal Year 2003 Bonds .....	1,034,973	—	—	—	—	—	18,262
9	Total First Resolution Debt Service .....		423,145	457,572	505,741	581,939	674,213	763,805
Subordinated Obligations								
10	Short-term Obligations .....		16,400	13,380	16,288	19,371	21,201	21,541
11	Outstanding Bonds (1) .....		105,765	102,947	111,256	89,648	78,952	76,942
12	1998 Series 3 Second Resolution Bonds .....		25,699	24,996	24,996	24,996	49,836	46,628
Anticipated Future Second Resolution Bonds.								
13	Fiscal Year 1998 Bonds .....	100,000	7,225	10,716	9,513	9,513	9,513	9,513
14	Fiscal Year 1999 Bonds .....	190,000	—	3,616	19,157	18,074	18,074	18,074
15	Fiscal Year 2000 Bonds .....	180,000	—	—	3,254	18,206	17,123	17,123
16	Fiscal Year 2001 Bonds .....	180,000	—	—	—	3,254	18,206	17,123
17	Fiscal Year 2002 Bonds .....	180,000	—	—	—	—	3,254	18,206
18	Fiscal Year 2003 Bonds .....	180,000	—	—	—	—	—	3,254
19	Less: Current Capitalized Interest(2) .....		(820)	—	—	—	—	—
20	Less: Future Capitalized Interest(3) .....		—	(1,500)	(1,500)	(1,500)	(1,500)	(1,500)
21	Less: Current EFC Subsidy(4) .....		(23,090)	(22,576)	(21,543)	(20,270)	(19,337)	(18,561)
22	Less: Future EFC Subsidy(5) .....		(1,524)	(7,087)	(11,291)	(15,228)	(19,049)	(22,744)
23	Less: EFC Payments(6) .....		(12,821)	(12,311)	(11,769)	(11,195)	(11,264)	(10,618)
24	Actual Debt Service on Subordinated Bonds .....		116,834	112,181	138,869	134,869	165,009	174,981
25	Less: Interest Earnings-Subordinate Debt Service Fund .....		(2,329)	(3,136)	(3,056)	(3,346)	(3,167)	(3,877)
26	Less: Carryforward Revenues .....		(51,043)	(23,849)	(28,654)	(25,725)	(23,047)	(36,921)
27	Net Debt Service on Subordinated Bonds .....		63,462	85,196	106,651	105,798	138,795	134,183
28	Total Debt Service Payable from Current Revenues (Line 9+Line 27) .....		<u>\$486,607</u>	<u>\$542,768</u>	<u>\$612,392</u>	<u>\$687,737</u>	<u>\$813,008</u>	<u>\$897,988</u>

(1) Debt service on outstanding bonds reflects the effects of the anticipated exchange of certain bonds for the 1998 Series 3 Second Resolution Bonds.

(2) Includes capitalized interest on outstanding subordinated bonds.

(3) Includes capitalized interest on anticipated future subordinated bonds.

(4) Includes the estimated EFC subsidy on outstanding subordinated bonds.

(5) Includes the estimated EFC subsidy on anticipated future subordinated bonds.

(6) Represents anticipated transfers of surplus payments used to offset interest payments due on the Fiscal 1998 Series 3 Bonds.

Source: Black & Veatch

Debt service payments on anticipated future Bond issues of the Authority reflect a 30 year term with level annual payments. The interest rates utilized in computing the anticipated debt service payments for future fixed rate issues average approximately 6.25% for Fiscal Year 1998 and 7.25% thereafter. The interest rate utilized for currently outstanding and future variable rate issues is 4.0%. The amount of long-term variable rate debt currently outstanding is approximately 10% of the Authority's total debt outstanding and is expected to range

between 10% and 15% in the future. Debt service payments on anticipated future Second Resolution Bond issues of the Authority assumes that Second Resolution Bonds continue to be issued to EFC and reflect a 20 year term with level annual payments. The interest rates utilized in computing the anticipated debt service payments for future EFC bonds secured by Second Resolution Bonds average approximately 7.10%. The Capitalized Interest and EFC subsidy shown in the table include interest capitalized for one year on bonds sold to EFC and subsidies expected to be provided by EFC for these issues, respectively. It is also anticipated that Authority bond issues sold to EFC will continue to be structured so that the interest rate on such bonds is calculated to reflect the anticipated EFC subsidy. Varying principal amounts are necessary to meet the annual capital funding needs as reviewed by Metcalf & Eddy. The principal amounts include funds necessary for construction, reserve funds, and the costs of issuance.

### Debt Service Requirements

The following schedule sets forth the amount required to be paid during each Fiscal Year ending June 30 of the years shown for the payment of the principal (including the accreted value of all capital appreciation Bonds) of and the interest on bonds issued under the Resolutions after giving effect to the issuance of the Fiscal 1998 B Bonds and the 1998 Series 3 Second Resolution Bonds and assuming that Variable Rate Bonds bear interest at a fixed rate to their maturity of 4% per annum. The schedule does not include debt service on any outstanding Commercial Paper Notes.

Fiscal Year Ending June 30	Outstanding Bonds Total Debt Service(1)	Fiscal 1998 B Bonds Total Debt Service	Total Bonds Debt Service(2)	Outstanding Second Resolution Bonds Total Debt Service(1)	1998 Series 3 Second Resolution Bonds Total Debt Service	Total Second Resolution Bonds Debt Service(2)	Total Bonds and Second Resolution Bonds Debt Service(2)
1998	\$ 406,303,411	\$ 16,841,843	\$ 423,145,254	\$ 81,855,455	\$ 25,699,018	\$ 107,554,472	\$ 530,699,726
1999	401,778,505	23,319,475	425,097,980	80,370,741	24,996,065	105,366,806	530,464,786
2000	392,062,187	23,319,475	415,381,662	89,713,179	24,996,065	114,709,244	530,090,906
2001	405,915,180	23,319,475	429,234,655	69,377,795	24,996,065	94,373,860	523,608,515
2002	421,093,564	23,319,475	444,413,039	59,614,999	49,836,065	109,451,064	553,864,103
2003	423,880,441	23,319,475	447,199,916	58,380,942	46,627,945	105,008,887	552,208,802
2004	423,948,081	23,319,475	447,267,556	59,170,330	51,193,335	110,363,665	557,631,221
2005	429,186,375	23,319,475	452,505,850	56,587,255	55,366,810	111,954,065	564,459,914
2006	423,578,553	23,319,475	446,898,028	59,734,622	56,168,885	115,903,507	562,801,534
2007	424,353,130	23,319,475	447,672,605	60,706,327	57,044,185	117,750,512	565,423,117
2008	424,673,339	23,319,475	447,992,814	61,761,795	61,083,270	122,845,065	570,837,879
2009	423,417,265	23,319,475	446,736,740	62,813,045	62,068,870	124,881,915	571,618,655
2010	410,423,203	23,319,475	433,742,678	90,155,811	63,128,850	153,284,661	587,027,339
2011	399,647,485	23,319,475	422,966,960	109,227,997	64,246,650	173,474,647	596,441,607
2012	393,544,041	23,319,475	416,863,516	115,637,634	65,452,650	181,090,284	597,953,800
2013	407,577,086	23,319,475	430,896,561	154,836,862	12,424,750	167,261,612	598,158,173
2014	406,328,413	23,319,475	429,647,888	39,317,603	10,748,250	50,065,853	479,713,741
2015	441,431,894	23,319,475	464,751,369	28,363,856	247,250	28,611,106	493,362,475
2016	441,433,224	23,319,475	464,752,699	19,003,000	120,750	19,123,750	483,876,449
2017	441,194,450	23,319,475	464,513,925	14,547,215	0	14,547,215	479,061,140
2018	451,796,306	23,319,475	475,115,781	2,463,229	0	2,463,229	477,579,010
2019	450,468,281	23,319,475	473,787,756	1,665,140	0	1,665,140	475,452,897
2020	450,495,103	23,319,475	473,814,578	0	0	0	473,814,578
2021	450,520,781	23,319,475	473,840,256	0	0	0	473,840,256
2022	450,559,125	23,319,475	473,878,600	0	0	0	473,878,600
2023	450,584,488	23,319,475	473,903,963	0	0	0	473,903,963
2024	451,790,269	23,319,475	475,109,744	0	0	0	475,109,744
2025	451,791,975	23,319,475	475,111,450	0	0	0	475,111,450
2026	451,794,625	23,319,475	475,114,100	0	0	0	475,114,100
2027	190,311,500	23,319,475	213,630,975	0	0	0	213,630,975
2028	190,573,000	132,969,475	323,542,475	0	0	0	323,542,475
2029	201,609,500	132,967,850	334,577,350	0	0	0	334,577,350
2030	0	235,974,088	235,974,088	0	0	0	235,974,088
2031	0	0	0	0	0	0	0
Total(2)	\$12,984,064,777	\$1,195,018,031	\$14,179,082,808	\$1,375,304,831	\$756,445,728	\$2,131,750,558	\$16,310,833,366

(1) Reflects the effects of the anticipated exchange of bonds pursuant to the Plan of Finance.

(2) Totals may not add due to rounding.

## FINANCIAL OPERATIONS

The following tables present certain historical data relating to the System which have been derived from the books and records of the City, the Authority and the Board.

### Revenues

The following table presents the System revenues received during Fiscal Years 1993 through 1997 as derived from the supplemental schedules of cash receipts contained in annual financial statements for Fiscal Years 1993 through 1996 and as estimated for Fiscal Year 1997.

#### System Revenues (Thousands of Dollars)

<u>Revenue Category</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>Estimated 1997</u>
Flat Rate—Water and Sewer Charges(1) . . .	\$ 625,295	\$ 679,916	\$ 495,778	\$ 492,710	\$ 495,275
Metered—Water and Sewer Charges(1)(2) . .	358,199	415,693	533,713	596,582	648,846
Meter—Upstate Customers . . . . .	5,552	7,267	7,657	8,295	9,112
Miscellaneous Revenues(3) . . . . .	7,757	25,883	47,374	38,558	45,106
Interest Penalty—Late Charges . . . . .	23,624	25,358	25,152	21,097	15,218
Interest Income . . . . .	63,540	33,507	57,034	68,465	63,596
Tax Lien Sale . . . . .	—	—	—	25,358	13,595
<b>Total . . . . .</b>	<b><u>\$1,083,967</u></b>	<b><u>\$1,187,624</u></b>	<b><u>\$1,166,708</u></b>	<b><u>\$1,251,065</u></b>	<b><u>\$1,290,748</u></b>

(1) Includes both current payments and payments relating to accounts in arrears.

(2) Includes industrial surcharges to certain users of the Sewer System.

(3) Miscellaneous Revenues are primarily comprised of water and sewer connection and disconnection fees, repair fees, meter installation fees, water usage permits, special meter reading fees and subsidy payments from EFC.

In connection with Fiscal Year 1996 and Fiscal Year 1997 sales of liens on real property securing delinquent property taxes, the City Department of Finance also sold liens on such property securing delinquent water and sewer charges.

## Expenses

The following table presents System expenses for Fiscal Years 1993 through 1997. The System expenses, which have been derived from the supplemental schedules contained in annual financial statements for Fiscal Years 1993 through 1996 and have been estimated for Fiscal Year 1997, represent operation, maintenance and general expenses excluding the lease rental payment to the City and certain other items.

### System Expenses (Thousands of Dollars)

<u>Expense Category</u>	<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>Estimated 1997</u>
Water(1)					
Personal Service(2) .....	\$ 79,972	\$ 85,153	\$ 89,648	\$ 94,446	\$ 98,728
Other Than Personal Service(3) .....	102,082	106,253	114,148	112,356	144,945
Total .....	182,054	191,406	203,796	206,802	243,673
Sewer(1)					
Personal Service(2) .....	153,507	154,027	156,002	152,541	149,191
Other Than Personal Service(3) .....	161,386	171,820	183,992	170,801	188,399
Total .....	314,893	325,847	339,994	323,342	337,590
Sub-Total .....	496,947	517,253	543,790	530,144	581,263
Administrative and General(4) .....	9,811	17,290	15,047	14,490	13,100
Indirect Expenses(5) .....	23,703	23,765	40,803	39,784	34,166
Total System .....	<u>\$530,461</u>	<u>\$558,308</u>	<u>\$599,640</u>	<u>\$584,418</u>	<u>\$628,529</u>

- (1) Certain historical, administrative and overhead costs of DEP were allocated to the water and sewer functions based upon the proportion of applicable personnel within DEP.
- (2) Personal Service costs include salaries, fringe benefits and pension costs.
- (3) Other Than Personal Service costs include real estate taxes paid to upstate communities for watershed properties, land-based sludge disposal costs and for electricity, chemicals and supply costs.
- (4) Administrative and General include Authority and Water Board expenses.
- (5) Indirect Expenses include City agency support, customer accounting, and judgments and claims costs.

## Projected Revenues

The following table indicates estimated revenues of the System for Fiscal Years 1998 through 2003. Revenues of the System consist of several components which have been analyzed and projected independently. Projected revenues are inclusive of revenue increases required during Fiscal Years 1998 through 2003.

User payments include an increase in cash receipts due to implementation of a quarterly billing program for all metered customers of the System and an enhanced follow-up program for delinquent accounts. Both programs are anticipated to be implemented within the next year in conjunction with the new Customer Information System ("CIS").

As indicated in the table, user payments are projected to increase from \$1,229,270,000 in Fiscal Year 1998 to \$1,646,081,000 in Fiscal Year 2003. Fiscal Year 1998 revenues from user payments reflect an increase in water and sewer rates of 6.5% which became effective July 1, 1997. Anticipated future rate increases averaging 5.7% in Fiscal Year 1999, 5.7% in Fiscal Year 2000, 5.7% in Fiscal Year 2001, 4.7% in Fiscal Year 2002 and 4.7% in Fiscal Year 2003 account for the majority of the increase in user payments in Fiscal Year 1998 through Fiscal Year 2003. Upstate revenues, shown on Line 2 of the table, are projected to increase from \$10,023,000 in Fiscal Year 1998 to \$13,160,000 in Fiscal Year 2003. This revenue growth is due to expected increases in the cost of water supply services and an assumption that future revenue from these customers will more closely match the cost of providing service. Miscellaneous revenues, shown on Line 4 of the table, include fees from activities such as the review, inspection, approval of System connections.

Nonoperating income consists of interest income on System funds, miscellaneous interest income, and other income. Line 6 of the table shows projected interest earnings on System funds including available balances in the Construction Fund and the Debt Service Reserve Fund. Line 7 of the table shows miscellaneous interest earnings which is interest paid by customers on overdue accounts. Line 12 reflects interest earnings on the debt service fund for Second Resolution Bonds. See "RATES AND BILLINGS—Billing and Collection".

**Projected Revenues**  
**(Thousands of Dollars)**

Line No.	Description	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003
Operating Revenues							
1	User Payments(1) .....	\$1,229,270	\$1,290,955	\$1,351,145	\$1,445,107	\$1,576,728	\$1,646,081
2	Upstate Revenues .....	10,023	10,675	11,368	11,937	12,534	13,160
3	Subtotal Service Revenue .....	1,239,293	1,301,630	1,362,514	1,457,044	1,589,262	1,659,241
4	Miscellaneous Revenues(2) .....	7,058	7,411	7,781	8,170	8,579	9,008
5	Total Operating Revenue .....	1,246,351	1,309,041	1,370,295	1,465,214	1,597,841	1,668,249
Nonoperating Revenues							
6	Interest Income on System Funds(3) .....	78,646	58,433	65,708	74,441	83,542	91,333
7	Miscellaneous Interest Income(4) .....	25,000	25,000	25,000	25,000	25,000	25,000
8	EFC Subsidy on Outstanding Bonds .....	13,058	5,153	4,945	4,718	4,472	4,208
9	Subtotal Nonoperating Revenues .....	116,704	88,586	95,653	104,159	113,014	120,541
10	Total Revenues .....	1,363,055	1,397,627	1,465,948	1,569,373	1,710,855	1,788,790
11	EFC Subsidy and Surplus Payments(5) .....	37,435	41,974	44,603	46,693	49,650	51,923
12	Additional Interest Earnings(6) .....	2,329	3,136	3,056	3,346	3,167	3,877
13	Total System Revenues .....	\$1,402,819	\$1,442,737	\$1,513,607	\$1,619,412	\$1,763,672	\$1,844,590

- (1) User payments include service revenues from metered and flat rate customers.
- (2) Miscellaneous revenues include fees from the review, inspection and approval of system connections.
- (3) Includes interest income on the Construction Fund, the Debt Service Reserve Fund and the Debt Service Reserve Fund. FY 1998 revenues reflect the one-time impact of changes in Revenue calculations that will result from the implementation of the Twenty-second Supplemental Resolution.
- (4) Includes interest income on overdue accounts.
- (5) Subsidy funds used as an offset to debt service on subordinate bonds.
- (6) Includes interest earnings on the debt service fund of subordinate bonds.

Column subtotals and totals may reflect adjustments for rounding of amounts shown in individual line items.

Source: Black & Veatch

## Projected Operating and Maintenance Expenses

The table set forth below shows, for Fiscal Years 1998 through 2003, the System's projected operation and maintenance expenses. The Fiscal Year 1998 budget for the System has been used as a base for the forecast of operation and maintenance expenses.

### Projected System Expense (Thousands of Dollars)

Line No.	Description	FY 1998	FY 1999	FY 2000	FY 2001	FY 2002	FY 2003
1	Authority/Board Operations .....	\$ 11,000	\$ 13,000	\$ 13,650	\$ 14,333	\$ 15,049	\$ 15,802
	Water Operations:						
2	Personal Services .....	105,909	108,332	110,403	112,552	114,803	117,099
3	Other Than Personal Services .....	157,277	157,310	160,380	168,053	175,735	181,007
4	Total Water Operations .....	263,186	265,642	270,783	280,605	290,538	298,106
	Wastewater Operations:						
5	Personal Services .....	160,530	164,177	167,233	170,596	174,008	177,488
6	Other Than Personal Services .....	228,308	196,920	196,073	199,714	205,705	211,877
7	Total Wastewater Operations .....	388,838	361,097	363,306	370,310	379,713	389,365
8	Indirect Expenses .....	15,093	14,793	14,793	14,793	14,793	14,793
9	Judgments and Claims .....	3,000	3,000	3,000	3,000	3,000	3,000
10	Total Operating Expenses .....	681,117	657,532	665,532	683,041	703,094	721,065
	Less:						
11	Trust Account Withdrawals .....	(40,000)	(15,000)	(15,000)	(10,652)	0	0
12	Credit for Operating Expenses in Prior Years .....	0	0	0	0	0	0
13	Net Operating Expenses .....	\$641,117	\$642,532	\$650,532	\$672,389	\$703,094	\$721,065

Totals may not add due to rounding.

Source: Black & Veatch

Operation and Maintenance Expenses include administrative costs associated with the Authority and the Board, direct operating costs for the System, indirect operating costs of DEP, and other expenses and adjustments to annual operating expenses. Each of these is explained more fully below.

*The Authority/Board Operations.* Administrative expenses of the Authority and the Board, shown on Line 1 of the table above, include annual fees required by EFC in connection with the Authority's involvement in the State Revolving Fund Program. These fees are projected to average approximately \$2.4 million per year through Fiscal Year 2003. Other expenses of the Authority include fees related to adjustable rate bonds and the management of investments.

*Water Operations.* The operating costs of the Water System include direct operation and maintenance costs applicable to one or more functional areas of the Water System and the distribution system as well as certain indirect operating costs of the DEP which are allocated between the Water System and the Sewer System. The operating costs of the Water System are divided into personal services costs and other than personal services costs. Personal services costs include direct salary costs plus fringe benefit and pension costs.

Other than personal services costs include property taxes paid to upstate communities for watershed properties as well as chemicals, electricity, and other expenses. The forecast includes an allowance for an increase in property taxes to be paid to upstate communities related to the acquisition of additional land for watershed protection.

All but a small percentage of the Water System functions by gravity so that electricity costs necessary to maintain normal water distribution are relatively small. In drought conditions, additional pumping is necessary for optimal distribution of water available from the System, thereby causing increased electricity costs. The forecasted cash flows currently assume that water consumption will decline by 0.5% each year from Fiscal Year 1998 through Fiscal Year 2003 independent of any drought-related measures based on expected effects of the universal metering program and water conservation initiatives of DEP.



Personal services costs reflect the results of collective bargaining labor agreements for fiscal years 1998 through 2001. Fiscal Year 2002 and Fiscal Year 2003 each include a 2% per year increase. Other than personal services costs are assumed to increase at an estimated rate of 3% per year for the forecast period.

In accordance with the watershed protection agreement, DEP will implement additional programs which will enhance the ability of the City and the communities located in the watershed area to protect the quality of the water supply. Such programs will include certain capital investments which are contained within the CIP. The forecasted operation and maintenance expenses for the Water System reflect the expected increase in operation and maintenance costs due to the watershed agreement.

The operation and maintenance expenses of the Water System also include the net increase in expenses associated with City operation of Jamaica Water Supply Company ("Jamaica"), the Queens portion of which the City acquired in June 1996. Water revenues from Jamaica customers are also included.

*Wastewater Operations.* The operating costs of the Sewer System include direct operation and maintenance costs applicable to one or more functional areas of the Sewer System as well as certain indirect operating costs of DEP allocated to the Water System and the Sewer System. The operating costs of the Sewer System are also divided into personal services and other than personal services costs. Personal services costs include direct salary costs plus fringe benefits and pension costs.

Other than personal services costs include electricity for the wastewater treatment plants, pump stations and service yards, chemicals, and other expenses. Electricity, which represents a significant expense in operating the treatment plants and pump stations, is supplied primarily by the Power Authority of the State of New York and cost approximately \$30 million for Fiscal Year 1996. The major other than personal services cost component is sludge disposal. The annual costs of sludge disposal are anticipated to remain relatively constant at \$95.0 million in Fiscal Year 1998 and expected to decline by \$24 million for Fiscal Year 1999 and thereafter after the end of the term of current disposal contracts. The anticipated future reduction in costs is reflected in the Projected System Expenses. The remaining personal services costs are assumed to increase in accordance with collective bargaining agreements for Fiscal Years 1998 to 2001 and 2% annually thereafter. Other than personal services costs are assumed to increase at an estimated rate 3% per year, for the forecast period. Certain other cost adjustments are reflected in the forecasted cash flow as adjustments are made to specific operating programs based upon System needs.

*Other Expenses.* Other expenses of the System include indirect expenses and judgments and claims. Indirect expenses, shown on Line 8 of the table, reflect costs allocated to the System for support provided by various City agencies and departments. Services provided include budget preparation and review, cost and revenue accounting, billing and collection, and legal support. The method of allocating these costs to the System is based upon costs initially allocated to DEP and subsequently divided between those attributable to water and sewer and those costs associated with other activities of DEP. The costs allocated to DEP as a whole are derived from the total costs of City support agencies and departments and a formalized cost allocation plan which distributes the costs to affected departments and agencies. DEP's billing and collection expenses are included in the operation and maintenance costs of the Water System and the Wastewater System.

Judgments and claims against the System, shown on Line 9 of the table, have averaged approximately \$2.4 million per year between Fiscal Year 1991 and Fiscal Year 1996, exclusive of construction contract claims for which an annual allowance is included in the capital improvement program. Based on historical experience, claims for Fiscal Year 1998 and subsequent years are projected at \$3.0 million per year.

*Credits Against Operation and Maintenance Expense.* Pursuant to a consent decree (the "Consent Decree") entered into in 1989 under the Marine Protection Research and Sanctuaries Act of 1972 ("MPRSA"), as amended by the Ocean Dumping Ban Act of 1988 (the "Ban Act"), DEP ceased the ocean disposal of sludge in June 1992. The Ban Act and the Consent Decree provide that 85% of the fees and penalties paid shall be deposited into a trust account and shall be available to reimburse the City for costs incurred for developing alternative sludge disposal facilities. As of December 31, 1996, the value of the

trust account was \$90.3 million. It is assumed that this value will increase with interest earnings at the rate of 4% per year until withdrawals are made. A portion of the balance of the fees and penalties was paid to USEPA with the remainder divided equally between the New York State Water Pollution Control Revolving Fund and the New York State Clean Oceans Fund. Amounts paid to the Clean Oceans Fund are also available to reimburse the City for the costs of developing alternative sludge management programs. A withdrawal of \$12 million was made in Fiscal Year 1997, and it is anticipated that \$40.0 million in Fiscal Year 1998, \$15.0 million in Fiscal Year 1999, \$15.0 million in Fiscal Year 2000 and approximately \$10.6 million in Fiscal Year 2001 will be available as an offset to operation and maintenance expenses in those years. See "THE SYSTEM—The Sewer System—Sludge Disposal".

### **Projected Financial Operations**

The following table shows a summary of the forecasted cash flows for the Authority for Fiscal Year 1998 through Fiscal Year 2003. The estimated net surplus at the end of Fiscal Year 1997 of \$51.0 million has been used to offset the Revenue requirements for the debt service on subordinate obligations in Fiscal Year 1998. Projected rate increases have been assumed in order to meet cash expenditure requirements and to comply with debt service requirements pursuant to the Resolutions. See "FINANCIAL OPERATIONS—Projected Revenues". The average anticipated future rate increases have been assumed in order to meet cash expenditure requirements and comply with debt service requirements as set forth in the Resolution. As shown on Line 32 of the table, positive net surpluses are maintained throughout the reporting period. Line 33 of the table shows that the annual debt service coverage requirement of 115% for the Bonds is met each year. Line 34 of the table shows projected annual debt service coverage for the Bonds and Second Resolution Bonds payable from current revenues on a combined basis.

**Forecasted Cash Flows\***  
(Thousands of Dollars)

Line No.	Description	Fiscal Year 1998	Fiscal Year 1999	Fiscal Year 2000	Fiscal Year 2001	Fiscal Year 2002	Fiscal Year 2003
Operating Revenues							
1	Water and Sewer User Payments .....	\$1,229,270	\$1,290,955	\$1,351,145	\$1,445,107	\$1,576,728	\$1,646,081
2	Upstate Revenue .....	10,023	10,675	11,368	11,937	12,534	13,160
3	Miscellaneous Revenue .....	7,058	7,411	7,781	8,170	8,579	9,008
Other Revenues							
4	Miscellaneous Interest Income .....	25,000	25,000	25,000	25,000	25,000	25,000
5	Interest Income on System Funds .....	78,646	58,433	65,708	74,441	83,542	91,333
6	EFC Subsidy on Outstanding Bonds .....	13,058	5,153	4,945	4,718	4,472	4,208
7	Current Revenues Available for Debt Service .....	1,363,055	1,397,627	1,465,948	1,569,373	1,710,855	1,788,790
First Resolution Debt Service							
8	Outstanding Bonds(1) .....	406,303	401,779	392,062	405,915	421,094	423,880
9	Fiscal 1998 B Bonds .....	16,842	23,319	23,319	23,319	23,319	23,319
10	Anticipated Future Bonds .....	0	32,474	90,360	152,705	229,800	316,606
11	Total First Resolution Debt Service .....	423,145	457,572	505,741	581,939	674,213	763,805
Debt Service on Subordinated Obligations							
12	Short-term Obligations .....	16,400	13,380	16,288	19,371	21,201	21,541
13	Outstanding Bonds(1) .....	105,765	102,947	111,256	89,648	78,952	76,942
14	1998 Series 3 Second Resolution Bonds .....	25,699	24,996	24,996	24,996	49,836	46,628
15	Anticipated Future Second Resolution Bonds .....	7,225	14,332	31,924	49,047	66,170	83,293
16	Less: EFC Subsidy, Capitalized Interest and EFC Transferred Surplus Payments on Subordinated Bonds .....	(38,255)	(43,474)	(46,103)	(48,193)	(51,150)	(53,423)
17	Actual Debt Service on Subordinated Bonds .....	116,834	112,181	138,361	134,869	165,009	174,981
18	Less: Carryforward Revenues and Other Revenues(2) .....	(53,372)	(26,985)	(31,710)	(29,071)	(26,214)	(40,798)
19	Net Debt Service on Subordinate Bonds .....	63,462	85,196	106,651	105,798	138,795	134,183
20	Total Debt Service Payable from Current Revenues (line 11+line 19)	486,607	542,768	612,392	687,737	813,008	897,988
Operating Expenses							
21	Authority/Board Operations .....	11,000	13,000	13,650	14,333	15,049	15,802
22	Water System .....	263,186	265,642	270,783	280,605	290,538	298,106
23	Wastewater System .....	388,838	361,097	363,306	370,310	379,713	389,365
24	Indirect Expense .....	15,093	14,793	14,793	14,793	14,793	14,793
25	Judgments and Claims .....	3,000	3,000	3,000	3,000	3,000	3,000
26	Total Operating Expenses .....	681,117	657,532	665,532	683,041	703,094	721,065
27	Less: Trust Account Withdrawals .....	(40,000)	(15,000)	(15,000)	(10,652)	0	0
28	Net Operating Expenses .....	641,117	642,532	650,532	672,389	703,094	721,065
29	Rental Payment to the City of New York .....	176,482	148,672	152,299	161,200	132,833	137,587
30	Cash Financed Capital Construction .....	35,000	35,000	25,000	25,000	25,000	20,000
31	Total Expenses .....	852,599	826,204	827,831	858,589	860,927	878,652
32	Net Surplus .....	23,849	28,654	25,725	23,047	36,921	12,149
33	First Resolution Debt Service Coverage (line 7-line 28-line 19/line 11) .....	1.56	1.46	1.40	1.36	1.29	1.22
34	First and Second Resolution Debt Service Coverage from Current Revenues (line 7-line 28/line 20) .....	1.48	1.39	1.33	1.30	1.24	1.19

\* The table assumes that the amendments made by the Twenty-second Supplemental Resolution and the conforming amendments to the Agreement have taken effect.

(1) Reflects the effects of the anticipated exchange of bonds pursuant to the Plan of Finance.

(2) Carryforward revenues are equal to net surplus from the prior year.

Column subtotals and totals may reflect adjustments for rounding of amounts shown in individual line items.  
Source: Black & Veatch

## RATES AND BILLINGS

The System has approximately 820,000 water and sewer accounts. The vast majority of these accounts receive both water and sewer service. In developing areas such as portions of Staten Island where the System does not yet provide full service, accounts may be for water service only.

The Board's customer accounts are in two categories: approximately 618,000 metered accounts and approximately 202,000 flat-rate accounts. Only water service is metered. Charges are established for both flat-rate and metered customers with sewer charges computed as a percentage of water charges. The Board retains the firm of Black & Veatch for the purpose of conducting a detailed review of the structure of water and sewer rates. The Board considers the results of their rate studies in establishing its rates and charges for service.

The System's rates and charges are largely exempt from Federal or State regulation. The Board's water rates, fees and charges are not subject to further approval or regulation except for rates for upstate users. Participation in the Construction Grants Program, however, requires the maintenance of sewer charges sufficient to defray costs of operation, maintenance and replacement, and of surcharges for industrial discharges into the System's sewers levied in conformity with formulas set forth in the Clean Water Act and regulations thereunder. Rates, fees and charges for water supply are the responsibility of the Board. Data compiled from meter readings made by DEP inspectors furnish input for billings and information useful in determining the effectiveness of City-mandated conservation measures. For a discussion of limitations on water service rates, fees and charges, see "THE SYSTEM—Governmental Regulation—Water Supply Regulation—State" and "THE SYSTEM—Service Area".

### **Billing and Collection**

The Bureau of Customer and Conservation Services of DEP (the "Bureau") is responsible for rendering bills to customers of the System. Through its field offices in each borough of the City and its central offices in Queens, it is responsible for the installation and reading of meters and for the checking of meter accuracy, as well as the maintenance of current information for those customers on the flat-rate system of billing. Data files for flat-rate customers are kept current through the review of building alteration plans filed with the Buildings Department and forwarded to DEP, and by inspections performed by Bureau personnel.

Customer payments are mailed to a post office lockbox maintained by the Board and processed by a vendor bank (currently The Chase Manhattan Bank) under contract to the Board. Electronic fund transfers are also made to the Board's collection account by four mortgage service companies for payment of annual frontage charges on accounts serviced for member banks and institutions. The Bureau also collects payments over-the-counter at its borough offices after which they are deposited to the bank.

The billing and collection system processes have undergone a period of significant change. These changes are related to: the universal metering program; the consolidation of billing within a single agency, DEP; the implementation of new computer systems to support the modernization of billing operations; and the development of system enhancements required to customize the software to meet the needs of the water and sewer billing system. These changes have highlighted certain short-term problems which DEP is addressing.

The universal metering program is changing the basis of billing for over 75% of the System's customers formerly charged on a flat-rate basis. This has resulted in several new issues for DEP. Newly metered accounts lack a consumption history on which estimated bills can be based when DEP is unable to obtain a reading. In some cases this has led to inaccurate bills being rendered and an increase in the number of customer complaints. Also, because of the large volume of meter installations within a short period of time, there have been lags in converting flat-rate accounts to a metered basis of billing. These problems are being addressed. Unlike flat-rate charges which were commonly paid through mortgage escrow accounts, metered charges are billed directly to customers which, among other factors, has required DEP to handle a substantially higher volume of customer account inquiries.

System enhancements to the computer systems which support the billing process have been a major undertaking for the Board and DEP. In conjunction with these enhancements, the administration of billing operations has been consolidated and centralized into DEP. Formerly, the billing function required the cooperation and coordination by two City agencies, DEP and the Department of Finance. Among other matters, implementing this new billing system required the transfer of a large number of customer account records and data from the Department of Finance's files to the new system. Major efforts were undertaken to update and correct customer records, and to customize billing programs to fit the City's circumstances. Despite these efforts, problems were encountered which prevented the rendering of timely bills to approximately 10% of the customer base. Corrective action has been implemented to correct this condition. DEP has identified several areas which require additional resources to support its billing and customer service functions. The Fiscal Year 1998 operating budget includes approximately \$9 million in new resources for the Bureau to address these issues.

The forecasted revenues from user payments for Fiscal Year 1998 anticipate that, with the implementation of the billing enhancement initiatives by DEP, all customers will be appropriately billed during Fiscal Year 1998.

Ongoing corrections to customer accounts required the write-off of \$186 million of receivables in the process of the audit of the System's financial statements for the Fiscal Year ended June 30, 1996.

#### **Flat-Rate Accounts**

At the present time, approximately 202,000 accounts are billed annually through the flat-rate system. These accounts are charged for water through a computation which incorporates, among other factors, the width of the front of the building ("frontage"), the number of stories, the number of dwelling units, and the number of each of the water-using fixtures (such as bathtubs, showers and toilets) in the building. The flat-rate is computed when the building is first constructed, and amended upon notice from the City's Department of Buildings ("DOB") of building alterations or when a DEP inspector determines that the basis for charges is incorrect. Flat-rate annual bills are normally sent to customers prior to the start of each Fiscal Year and are due at the end of the first month of the Fiscal Year.

#### **Metered Accounts**

There are now approximately 618,000 metered accounts in use. Meters installed prior to July 1, 1987 are owned by the property owners, but must meet DEP specifications and be tested for accuracy. All meters installed or replaced by the City as part of the universal metering program are the property of the City.

Meters are intended to be read and billed on a quarterly basis except some larger accounts which are intended to be read and billed more frequently. Meter readings are captured electronically through the use of hand-held computers and a universal probe. Such data are relayed to computers in each field office and transmitted to a centralized computer billing system on a daily basis. Metered account bills are sent out regularly throughout the year.

The Board has amended its regulations to preclude any properties which are currently metered from changing to a flat-rate billing basis. Commercial accounts are required by the Board and the City to have meters installed on all water services. Substantially all of these accounts are in compliance with this requirement.

#### **Universal Metering Program**

The three major goals of universal metering of all water service in the City are water conservation, improved water supply system management and rate equity. Under the program, it is expected that all flat-rate accounts will be metered by the end of calendar year 1998. The City has issued contracts for the bulk purchase and installation of the meters. At the same time, existing meters are being tested and replaced by DEP where

necessary. All new meters incorporate remote devices which enable meter reading from outside the building. This has enhanced meter reading efficiency by eliminating the meter reader's need to gain building access. The installation of meters is being conducted on an area-by-area basis. As of June 30, 1997, approximately 446,000 meters had been installed under the Universal Metering Program. Upon the initiation of this program, the City assumed responsibility for the maintenance, repair and replacement of all meters.

The Universal Metering Program has and will continue to shift the basis of customer billing from the flat-rate system which relates to the physical characteristics of a property to the metered system which measures the actual usage of utility services. Billing based on actual usage has affected the level of charges to certain large multiple family residential buildings, in particular, those buildings with above average population density, and those with improperly maintained plumbing fixtures. The result is often a significant increase in charges to such buildings. In response to the needs of this segment of the customer base, the Water Board has adopted a transition program whereby owners of multiple family buildings which have had meters installed under the Universal Metering Program will continue to be billed on a flat-rate basis during the transition period. The transition program allows owners time to review their water usage, educate tenants regarding conservation, repair leaky plumbing, and/or install low flow fixtures in order to reduce consumption and charges. There are approximately 18,000 accounts in the transitional program.

On May 11, 1993, the Water Board adopted a program which provides for a cap on the per unit charge on multiple family dwellings. The cap is set at approximately 150% of the average per family unit charge. In order to be eligible for this program, building owners must submit to a water audit by DEP and take measures to eliminate leakage and waste.

Revenues from newly metered accounts may increase or decrease somewhat depending on how closely the flat-rate billing factors previously used compare to actual metered consumption for these accounts. Based upon recent experience, a one-time decrease in collections will occur for each account as it is metered due to the transition from billing in advance under flat-rates to billing after consumption occurs. The one-time effect is taken into account in the forecasted revenues of the System.

#### **Exempt Accounts**

Certain institutions are exempt under State law from the payment of all or a portion of their water and sewer charges depending upon usage. These institutions include religious, certain educational and other charitable institutions as well as homes for the aged, hospitals and other non-profit or charitable corporations. For Fiscal Year 1998, flat-rate accounts of these institutions which would be charged less than \$10,462 per year for water service are fully exempt from water and sewer charges with a 50% exemption for those accounts ranging from \$10,462 to \$20,852 in annual water charges. Flat-rate accounts charged in excess of \$20,852 are not exempt. The thresholds for metered accounts of these institutions are \$11,649 and \$23,297. There are approximately 4,000 exempt accounts. Less than 1% of these accounts were partially exempt; the remainder were fully exempt.

## Rates

The following table sets forth the changes in rates for water and sewer service since 1986:

### History of Water and Sewer Rate Increases

Effective Date	Change in Flat-Rate Water	Change in Metered Water	Metered Water Rate	Change in Sewer
July 1, 1986	Increased 9.9%	Increased 9.9%	72.5¢ per ccf	Remained at 60% of water charge.
July 1, 1987	Increased 12%	Increased 12%	81¢ per ccf	Increased to 70% of water charge.
July 1, 1988	Increased from \$14.06 to \$26.40 per year for each additional family above the single family assumed in an individual flat-rate account.	No change	81¢ per ccf	Increased to 75% of water charge.
July 1, 1989	Increased from \$26.40 to \$41.86 per year for each additional family above the single family assumed in an individual flat-rate account. Remaining flat rate charges increased by 7.8%.	Increased 7.8%	87¢ per ccf	Increased to 88% of water charge.
Jan. 1, 1990	Increased 9%	Increased 9%	95¢ per ccf	Increased to 112% of water charge.
July 1, 1991	Increased 6.4%	Increased 6.4%	\$1.01 per ccf	Increased to 136% of water charge.
July 1, 1992	No change	No change	\$1.01 per ccf	Increased to 159% of water charge.
July 1, 1993	No change	No change	\$1.01 per ccf	No change.
July 1, 1994	No change	No change	\$1.01 per ccf	No change.
July 1, 1995	Increased 5%	Increased 5%	\$1.06 per ccf	No change.
July 1, 1996	Increased 6.5%	Increased 6.5%	\$1.13 per ccf	No change.
July 1, 1997	Increased 6.5%	Increased 6.5%	\$1.20 per ccf	No change.

*Projected Rates.* Although the Board sets rates for an annual period it may increase rates during the annual period, as required. Currently forecasted debt service, operating and other costs for the System indicate that the anticipated future rate increases to be set by the Board combined for water and sewer services average approximately 5.7% for Fiscal Year 1999, 5.7% for Fiscal Year 2000, 5.7% for Fiscal Year 2001, 4.7% for Fiscal Year 2002 and 4.7% for Fiscal Year 2003.

*Basic Sewer Charge.* For all properties connected to the Sewer System, there is a charge imposed equal to a fixed percentage of the property's water charge. Since July 1, 1992, the sewer charge has remained at 159% of the water charge.

*Sewer Allowances.* Certain commercial customers use water in their products and thus return less waste to the Sewer System than their water consumption might indicate. Upon application and approval, these commercial users are entitled to an effective rate reduction which reflects the proportion of water which is retained in their products or evaporated and not returned as sewage.

*Sewer-only Customer Charges.* In the case of premises which receive water service from alternative sources, a sewer charge is determined by DEP. For the current Fiscal Year, the sewer charge to such premises is equal to 159% of the dollar amount that would be charged for water usage if it were supplied by the Water System.

*Partial Sewer Charge Accounts.* A small number of customers, located primarily in Staten Island, receive wastewater treatment services from privately owned and operated wastewater treatment facilities. Such accounts are charged for sewer collection services only at a lower rate than the basic sewer charge. The lower rate, which

is equal to 38% of the water charges assessed on an account, reflects the fact that such accounts do not receive wastewater treatment services, but do use the System's sewage collection system to carry wastewater to and/or away from the privately owned treatment plant.

*Upstate Water Rates.* Rates for water supply service provided to municipalities and water districts located north of the City are established in accordance with the provisions of the Water Supply Act of 1905. The 1905 Act provides that such rates shall be based on the System's actual cost of service. The sale of water and the rates and charges for these accounts are regulated by State law as well as by individual agreements between these communities and the City. Each contract provides for the metering of water sales to individual communities and the application of a specific charge per unit of metered volume. In most cases, per capita consumption in the upstate communities is less than that of customers within the City. In those instances where the community per capita consumption exceeds that of the City, the specified rate of charge for the excess is increased to match the rates and charges applied to retail service in the City. Water taken from either the Croton or Catskill/Delaware systems is currently charged at a rate of \$274.93 per million gallons.

### Comparative Annual Water and Sewer User Charges

*Comparative Charges.* The following table presents comparative annual water and sewer charges for 1997 in 24 large cities based upon a survey conducted by Black & Veatch. Using a ranking system where 1 represents the lowest rates, the City's ranking relative to these cities is: for Single-Family Residential—9, for Commercial—12, and for Industrial—13.

**Comparative Annual Water and Sewer User Charges(1)**

<u>Single Family Residential</u>		<u>Commercial</u>		<u>Industrial</u>	
<u>City</u>	<u>Annual Charge</u>	<u>City</u>	<u>Annual Charge</u>	<u>City</u>	<u>Annual Charge</u>
Chicago.....	\$185	Detroit .....	\$2,263	Milwaukee.....	\$173,487
Detroit.....	277	Milwaukee.....	2,333	Detroit .....	186,031
Milwaukee.....	282	San Antonio.....	2,400	Indianapolis.....	195,580
Baltimore.....	313	Chicago.....	2,630	San Antonio.....	225,024
San Antonio.....	331	Baltimore.....	2,716	St. Louis.....	232,598
St. Louis.....	344	Indianapolis.....	2,841	Baltimore.....	240,279
Newark.....	374	St. Louis.....	2,920	Dallas.....	253,490
Indianapolis.....	376	Dallas.....	2,928	Chicago.....	263,019
<b>New York.....</b>	<b>391</b>	New Orleans.....	3,593	Newark.....	271,132
Los Angeles.....	403	Newark.....	3,739	New Orleans.....	286,903
Columbus.....	443	Columbus.....	3,796	Philadelphia.....	289,126
Cleveland.....	445	<b>New York.....</b>	<b>3,913</b>	Columbus.....	338,504
New Orleans.....	449	Philadelphia.....	3,924	<b>New York.....</b>	<b>391,270</b>
Dallas.....	479	San Diego.....	4,419	San Jose.....	409,886
Atlanta.....	527	Honolulu.....	4,492	San Diego.....	429,958
San Jose.....	528	Los Angeles.....	4,644	Honolulu.....	447,044
Washington, D.C.....	544	Cleveland.....	4,699	Los Angeles.....	453,834
Honolulu.....	563	San Jose.....	4,957	Cleveland.....	472,566
Houston.....	590	Atlanta.....	5,268	Atlanta.....	478,062
Philadelphia.....	597	Jacksonville.....	5,381	Jacksonville.....	486,881
San Diego.....	598	Washington, D.C.....	5,445	Washington, D.C.....	544,465
Jacksonville.....	631	Houston.....	6,279	Houston.....	620,975
Boston.....	725	Boston.....	7,408	Boston.....	773,151
San Francisco.....	761	San Francisco.....	9,042	San Francisco.....	885,573
Average.....	\$465	Average.....	\$4,251	Average.....	\$389,535

(1) User Charges are based upon information provided by the identified cities and standardized assumptions regarding water consumption, wastewater discharge, and other factors. Actual charges in each city will vary in accordance with local usage patterns. Charges for all cities reflect rate schedules in effect in March, 1997.



## THE SYSTEM

### Service Area

DEP supplies water and sewer service to the Boroughs of Manhattan, the Bronx, Brooklyn, Queens, and Staten Island, an area of over 300 square miles, and serves over 7,300,000 people. Water and/or sewer service is provided to approximately 820,000 accounts on either a flat-rate or metered basis. There are approximately 618,000 metered accounts and 202,000 flat rate accounts. The City is also required by State law to sell water in counties where its water supply facilities are located and where it currently provides water to an additional approximately one million people.

Daily consumption from the Water System averaged approximately 1,404 mgd during 1996, of which approximately 1,284 mgd was consumed in the City, and 120 mgd was consumed in Westchester, Putnam, Orange and Ulster Counties. Included within the City consumption was 31 mgd supplied to Jamaica comprising approximately 60% of the water consumed by the approximately 90,000 accounts in the Queens portion of Jamaica's service area. The Queens portion of Jamaica was acquired by the City in June 1996. Water consumption varied by season with the summer months having the largest demand. Peak flows in the Water System can exceed a rate of 2,000 mgd. The following table shows the average daily water consumption from the Water System from 1987 through 1996.

**Average Daily Water Consumption**

Calendar Year	Total (mgd)	Upstate Counties (mgd)	New York City	
			Total (mgd)	Per Capita* (gals/day)
1987	1,543	120	1,423	200
1988	1,582	125	1,457	204
1989	1,492	113	1,379	192
1990	1,525	122	1,403	195
1991	1,569	124	1,445	200
1992	1,462	114	1,348	187
1993	1,464	119	1,345	187
1994	1,454	119	1,335	185
1995	1,432	123	1,309	179
1996	1,404	120	1,284	177

\* Population source: U.S. Department of Commerce, Bureau of the Census.

The vast majority of System accounts receive both water and sewer service. The remaining customers are located in the few areas of the City, primarily in Staten Island, where sewer service is not yet established and, thus, accounts are water only.

Approximately 88% of the System's water and sewer customers are residential. The remainder are primarily commercial and industrial users with industrial customers accounting for only a small portion of water and sewer usage.

The information presented below is based upon an analysis conducted in Fiscal Year 1987 by Ernst & Young LLP. Billing percentages by customer class reflect total billings for each customer class less average cancellations and adjustments for metered customers.

### Customer Classifications

<u>Type of Account</u>	<u>Percentage of Total Accounts</u>	<u>Percentage of Total Billings</u>
One-Family Dwellings .....	37.5%	9.6%
Two-Family Dwellings.....	27.3	10.3
Walk-up Apartments (1) .....	15.9	19.0
Elevator Apartments (1) .....	2.7	25.7
Factories and Industrial .....	1.9	5.2
Stores .....	6.3	8.3
Office Buildings .....	0.9	5.6
Utility Properties .....	0.2	2.8
Lofts .....	0.9	2.6
Hospitals and Health Facilities .....	0.2	1.5
Hotels .....	0.2	2.3
Other .....	6.0	7.1
Total.....	<u>100.0%</u>	<u>100.0%</u>

(1) Certain accounts and billings under this type of account relate to commercial establishments located in apartment buildings.

Source: Ernst & Young LLP

Sewer service, except for significant parts of the borough of Staten Island, and the borough of Queens communities of Breezy Point, Douglaston, and the borough of Brooklyn community of Seagate, is provided to virtually the entire City. Sewer service is also provided to certain upstate communities in System watershed areas. Daily sewage flow from these upstate communities is approximately 2.7 mgd. In 1996, daily flows of sewage to the City treatment plants averaged approximately 1,405 mgd during dry weather.

### Jamaica Water Supply Company

In Fiscal Year 1996, the City acquired the portion of Jamaica located in the Borough of Queens at a price of approximately \$148 million, plus \$7.4 million for water meters acquired by the City and less \$1.8 million representing the value of a computer system which the City has not acquired. The acquisition resulted in increased operating and maintenance costs for the System as well as the addition of revenues from 90,000 additional accounts for water service. Former customers of Jamaica have begun to realize a significant reduction in their water bills on the current rates and charges of the Board.

### The Water System

#### *History*

Early Manhattan settlers obtained water for domestic purposes from shallow privately owned wells. In 1677 the first public well was dug in front of the old fort at Bowling Green. In 1776, when the population reached approximately 22,000, a reservoir was constructed on the east side of Broadway between Pearl and White Streets. Water pumped from wells sunk near the Collect Pond, east of the reservoir, and from the pond itself, was distributed through hollow logs laid in the principal streets. In 1800 the Manhattan Company (now The Chase Manhattan Bank) sank a well at Reade and Centre Streets, pumped water into a reservoir on Chambers Street and distributed it through wooden mains to a portion of the community. In 1830 a tank for fire protection was constructed by the City at 13th Street and Broadway and was filled from a well. The water was distributed through two 12-inch cast iron pipes. As the population of the City increased, the well water became polluted and supply was insufficient. The supply was supplemented by cisterns and water drawn from a few springs in upper Manhattan.

After exploring alternatives for increasing supply, the City decided to impound water from the Croton River, in what is now Westchester County, and to build an aqueduct to carry water from the Old Croton Reservoir to the City. This aqueduct, known today as the Old Croton Aqueduct, had a capacity of about 90 million gallons per day (mgd) and was placed in service in 1842. The distribution reservoirs were located in Manhattan at 42nd Street (discontinued in 1890) and in Central Park south of 86th Street (discontinued in 1925). New reservoirs were constructed to increase supply: Boyds Corner in 1873 and Middle Branch in 1878. In 1883 a commission was formed to build a second aqueduct from the Croton watershed as well as additional storage reservoirs. This aqueduct, known as the New Croton Aqueduct, was under construction from 1885 to 1893 and was placed in service in 1890, while still under construction. The present Water System was consolidated from the various water systems in communities now consisting of the Boroughs of Manhattan, the Bronx, Brooklyn, Queens and Staten Island.

In 1905 the Board of Water Supply was created by the State Legislature. After careful study, the City decided to develop the Catskill region as an additional water source. The Board of Water Supply proceeded to plan and construct facilities to impound the waters of the Esopus Creek, one of the four watersheds in the Catskills, and to deliver the water throughout the City. This project, to develop what is known as the Catskill System, included the Ashokan Reservoir and the Catskill Aqueduct and was completed in 1915. It was subsequently turned over to the City's Department of Water Supply, Gas and Electricity for operation and maintenance. The remaining development of the Catskill System, involving the construction of the Schoharie Reservoir and Shandaken Tunnel, was completed in 1928.

In 1927 the Board of Water Supply submitted a plan to the Board of Estimate and Apportionment for the development of the upper portion of the Rondout watershed and tributaries of the Delaware River within the State of New York. This project was approved in 1928. Work was subsequently delayed by an action brought by the State of New Jersey in the Supreme Court of the United States to enjoin the City and State of New York from using the waters of any Delaware River tributary. In May 1931 the Supreme Court of the United States upheld the right of the City to augment its water supply from the headwaters of the Delaware River. Construction of the Delaware System was begun in March 1937. The Delaware System was placed in service in stages: The Delaware Aqueduct was completed in 1944, Neversink Reservoir in 1950, Rondout Reservoir in 1951, Pepacton Reservoir in 1954 and Cannonsville Reservoir in 1967.

Water for the System is impounded in three upstate reservoir systems which include 18 reservoirs and three controlled lakes with a total storage capacity of approximately 550 billion gallons. The three water collection systems were designed and built with various interconnections to increase flexibility by permitting exchange of water from one system to another. This feature mitigates localized droughts and takes advantage of excess water in any of the three watersheds.

Water is conveyed to the City from the reservoirs of the Croton, Catskill and Delaware Systems by gravity through large aqueducts and balancing reservoirs. Within the City, water is distributed through two major tunnels and three distribution facilities. A third tunnel is now under construction and will supplement the two City tunnels currently in use.

In comparison to other public water systems, the Water System is both economical and flexible. Approximately 95% of the total water supply is delivered to the consumer by gravity. Only about 5% of the water is regularly pumped to maintain the desired pressure. As a result, operating costs are relatively insensitive to fluctuations in the cost of power. When drought conditions exist, additional pumping is required.

### *Water Collection*

The three main reservoir systems are the Croton, Catskill and Delaware. (See "New York City Water Supply System" map before the Appendices for the location of the reservoir systems.) The following is a brief description of the City's water collection system.

The following tables set forth the capacities and original in-service dates of the System's collecting and balancing reservoirs and distribution facilities based on the City records.

**Collecting Reservoirs**

<u>Name</u>	<u>Available Capacity* (Billion Gallons)</u>	<u>Original In-service Date</u>
<b>Croton</b>		
New Croton .....	19.0	1905
Croton Falls Main .....	14.2	1911
Cross River .....	10.3	1908
West Branch .....	8.0	1895
Titicus .....	7.2	1893
Amawalk .....	6.7	1897
East Branch .....	5.2	1891
Muscoot .....	4.9	1905
Bog Brook .....	4.4	1892
Middle Branch .....	4.1	1878
Boyds Corner .....	1.7	1873
Croton Falls Diverting .....	0.9	1911
Total .....	<u>86.6</u>	
<b>Catskill</b>		
Ashokan .....	122.9	1915
Schoharie .....	17.6	1926
Total .....	<u>140.5</u>	
<b>Delaware</b>		
Pepacton .....	140.2	1954
Cannonsville .....	95.7	1965
Rondout .....	49.6	1951
Neversink .....	34.9	1950
Total .....	<u>320.4</u>	
Total Available Capacity .....	<u>547.5</u>	

\* Capacity above minimum operating level.

**Balancing Reservoirs and Distribution Facilities**

<u>Name</u>	<u>Storage Capacity (Billion Gallons)</u>	<u>Original In-service Date</u>
<b>Balancing Reservoirs</b>		
Kensico .....	30.6	1915
Hillview .....	0.9	1915
Total .....	<u>31.5</u>	
<b>Distribution Facilities</b>		
Central Park .....	1.0	1862
Jerome Park .....	0.8	1905
Ridgewood (basin no. 3)* .....	0.1	1875
Silver Lake (tanks) .....	0.1	1970
Total .....	<u>2.0</u>	
Total Storage Capacity .....	<u>33.5</u>	

\* Currently only one of three basins is operational.

The amount of water that can be safely drawn from a watershed during the worst period in the drought of record is the "Dependable Yield". DEP has determined that the System could have furnished an average of 1,290 mgd during the drought of record in the mid-1960's. During periods of normal rainfall, watersheds supply more than the Dependable Yield. As of September 16, 1997, reservoir levels were at 67.1% of capacity compared to normal levels of 77.9%.

The following table sets forth the Dependable Yield and storage capacity for each of the water supply systems.

**Water System Yield and Capacity**

<u>System</u>	<u>Dependable Yield (mgd)</u>	<u>Storage Capacity(1) (billion gallons)</u>
Croton .....	240	86.6
Catskill .....	470	140.5
Delaware .....	580	320.4
Total .....	<u>1,290</u>	<u>547.5</u>

(1) Capacity above minimum operating level.

The City has allocated approximately \$5 million for planning and design of measures to control possible zebra mussel infestation of the upstate reservoir system and expects to spend approximately \$16 million through the year 2000 on construction of such controls.

*The Croton System:* The Croton System normally provides approximately 10% of the City's daily water supply and can provide substantially more of the daily water supply during drought conditions. The Croton System consists of 12 reservoirs and three controlled lakes on the Croton River, its three branches and three other tributaries. The water flows from upstream reservoirs through natural streams to downstream reservoirs, terminating at the New Croton Reservoir. The watershed drained by the Croton System is now extensively developed and the density of the population is beginning to adversely affect the original quality of this water source. See "THE SYSTEM—The Water System—Water Quality".

Operation of the Croton System commenced in 1842. The Croton System is divided into three subsystems: the West Branch, Croton Falls, and Muscoot. The watershed which supplies the Croton System has an area of 375 square miles. It lies almost entirely within the State, approximately 45 miles north of lower Manhattan, with a small portion in the State of Connecticut.

The West Branch subsystem is comprised of Boyds Corner and West Branch Reservoirs. West Branch Reservoir is connected to both the Delaware Aqueduct and the Croton Falls Main Reservoir. Water from the West Branch Reservoir is normally fed into the Delaware Aqueduct to take advantage of the high hydraulic head available.

The Croton Falls subsystem is made up of the Bog Brook, East Branch, Croton Falls Diverting, Middle Branch, and Croton Falls Main Reservoirs. Bog Brook and East Branch Reservoirs are connected by a 10-foot tunnel. Water from Croton Falls Diverting Reservoir can flow to either Croton Falls Main Reservoir or the Muscoot Reservoir. Water from Middle Branch Reservoir flows to Croton Falls Main Reservoir. Water from Croton Falls Main Reservoir can be pumped into the Delaware Aqueduct by operating the Croton Falls Hydraulic Pump Station or can flow to the Muscoot Reservoir.

The Muscoot subsystem is made up of the Titicus, Amawalk, and Cross River Reservoirs which all empty into the Muscoot Reservoir. Water from Cross River Reservoir can also be pumped into the Delaware Aqueduct by the Cross River Hydraulic Pump Station. The Muscoot Reservoir empties into the New Croton Reservoir. Water is then conveyed through the New Croton Aqueduct to Jerome Park Reservoir in the Bronx for distribution to consumers.

Engineering reports sponsored by the U.S. Army Corps of Engineers in the early 1980's indicated that the dams and reservoirs in the Croton System are safe but in need of some rehabilitation and reconstruction work. An ongoing reconstruction program has been established and funded in the CIP. The majority of the rehabilitation includes replacement and refurbishment of the outlet works and mechanical equipment within the gatehouses, improvements to the dam structures, maintenance of grounds and enlargement of the spillway capacities. Upon completion of the proposed reconstruction in 2002, all facilities in the Croton System will comply with the current national dam safety guidelines established in 1976.

The quality of the water in the Croton System, the City's oldest, does not consistently meet turbidity and color standards established by the New York State Sanitary Code (the "Sanitary Code"). As a result, the NYSDOH has mandated treatment to ensure the Croton System water continues to meet all quality standards. The key features of this program, the Croton Filter Project, are the construction of a demonstration water treatment plant at the Jerome Park Reservoir, site work improvements at the same location, improvements to the distribution system in Manhattan, the reconstruction of the Croton Lake Gatehouse and the construction of a full-scale water treatment plant. The first stages of this program have been completed and the planning phase for the construction of a full-scale water treatment plant at one of several possible sites is currently underway.

The City is a party to a 1992 stipulation with NYSDOH, which sets out a timetable for the design and construction of such full-scale water treatment plant. The City is engaged in discussions with NYSDOH and USEPA, seeking a modification of the timetable to allow for additional studies of plant design, alternate sites, and Croton System management options, as well as an extended period for design and construction. USEPA referred this matter to the United States Department of Justice which initiated an action against the City seeking a court-imposed timetable and the imposition of penalties on April 24, 1997. The United States filed suit against the City and DEP in United States District Court for the Eastern District of New York pursuant to the federal Safe Drinking Water Act ("SDWA") and the Federal Surface Water Treatment Rule ("SWTR"). The complaint alleges that the City violated the SDWA and the SWTR by not providing filtration for the Croton System by June 29, 1993, and that the City has been in violation of the SDWA and the SWTR since that date. The complaint requests that the Court order the City to design, construct and operate a Croton filtration plant on an expeditious schedule, and to comply with filtration, disinfection, monitoring and reporting requirements. In addition, the United States seeks civil penalties of up to \$25,000 for each day of violation of the SWTR or the SDWA occurring prior to January 31, 1997, and up to \$27,500 for each day of violation occurring on or after January 31, 1997 (along with awarding the United States its costs in the action).

The State of New York, with the consent of the City and the United States, intervened as a plaintiff in the action brought by the United States. The State alleges that the City has violated the State Sanitary Code and the terms of the 1992 stipulation. The State is seeking an order directing the City to design, construct and operate a Croton filtration plant on an expeditious schedule. The State is not seeking any penalties.

The City's position is that penalties are not warranted and should not be assessed by the Court in this action. Based on the City's past experience with enforcement actions of this type, the City expects that, if penalties are paid in connection with this matter, the amount thereof will be substantially less than the amount which the complaint in this action seeks. The City intends to defend this action vigorously, while at the same time continuing its discussions with USEPA and NYSDOH in an effort to reach a negotiated agreement on a modified timetable.

*The Catskill System:* The Catskill System watersheds occupy sparsely populated areas in the central and eastern portions of the Catskill Mountains and normally provide approximately 40% of the City's daily water supply. Water in the Catskill System comes from the Esopus and Schoharie Creek watersheds, located approximately 100 miles north of lower Manhattan and 35 miles west of the Hudson River. The Catskill System is comprised of the Schoharie and Ashokan Reservoirs and the Catskill Aqueduct. The Schoharie Reservoir is formed by the Gilboa Dam across the Schoharie Creek. The Ashokan Dam across the Esopus Creek forms the Ashokan Reservoir. Catskill System water has its origin in the Esopus Creek and Schoharie Creek watersheds.

These watersheds, occupying the central and eastern portions of the Catskill Mountains collect stream flow from the mountains of sparsely populated areas. The Esopus Creek watershed drains into the Hudson River and has an area of about 257 square miles. The Schoharie Creek watershed drains into the Mohawk River and has an area of about 314 square miles. The greater part of the water from these two watershed areas is stored in the Ashokan Reservoir and the balance is held in the Schoharie Reservoir.

Water from the Schoharie Reservoir is conveyed via the Shandaken Tunnel and Esopus Creek to Ashokan Reservoir and from there to Kensico Reservoir via the Catskill Aqueduct. The Catskill Aqueduct passes under the Hudson River and the New Croton Reservoir. At the New Croton Reservoir it is possible to introduce water from Ashokan Reservoir to the New Croton Reservoir to maximize the use of storage capacity. The Kensico Reservoir does not have a significant drainage area, but rather serves as a balancing reservoir for both the Catskill and Delaware Systems.

From the Kensico Reservoir Catskill System water flows to the Hillview Reservoir in Yonkers via the Catskill Aqueduct. Water is delivered from Hillview Reservoir to the City through Tunnels 1 and 2. It is also possible for the Catskill Aqueduct to bypass both Kensico and Hillview Reservoirs. Except for river crossings and a few sections of tunnel, the Catskill Aqueduct is a cut-and-cover conduit laid on grade. The Catskill System was completed between 1915 and 1927.

Metcalf & Eddy has concluded that the overall facilities in the Catskill System are in adequate condition (the highest rating category). See "APPENDIX A—LETTER OF METCALF & EDDY, CONSULTING ENGINEERS".

*The Delaware System:* The Delaware System, located approximately 125 miles north of lower Manhattan, normally provides approximately 50% of the City's daily water supply. Three Delaware System reservoirs collect water from a sparsely populated region on the branches of the Delaware River: Cannonsville Reservoir (formed by the Cannonsville dam on the West Branch of the Delaware River); Pepacton Reservoir (formed by the Downsview Dam across the East Branch of the Delaware River); and Neversink Reservoir (formed by the Neversink Dam across the Neversink River, a tributary to the Delaware River). These reservoirs feed eastward through separate rock tunnels, West Delaware, East Delaware and Neversink, to Rondout Reservoir where the Delaware Aqueduct begins. Rondout Reservoir is formed by the Merriman Dam across Rondout Creek. Although most of the water in Rondout Reservoir is Delaware River water drawn from the other three reservoirs, Rondout Reservoir is not in the Delaware River watershed since Rondout Creek flows into the Hudson River. Metcalf & Eddy has concluded that the overall facilities in the Delaware System are in adequate condition. See "APPENDIX A—LETTER OF METCALF & EDDY, CONSULTING ENGINEERS".

For operational flexibility, the three reservoir systems were designed and built with various interconnections which permit water from one system to be introduced into and mixed with water from another. Interconnections permit the System to mitigate localized droughts or to take advantage of excess water in any of the three watersheds. Croton System water, for example, can be introduced into the Delaware Aqueduct at West Branch, Cross River and Croton Falls Main Reservoirs; Delaware and Catskill System waters can be introduced into the Croton System at West Branch and New Croton Reservoirs, respectively.

Water may be pumped into the Delaware Aqueduct from the standby pump station at Chelsea, New York (the "Chelsea Pump Station") which draws from the Hudson River. The Chelsea Pump Station has a capacity of 100 mgd and pumped approximately 82 mgd of water from the river for almost five months during the 1985 drought. The Chelsea Pump Station also pumped approximately 90 mgd between May 1, 1989 and May 15, 1989. The second facility of its type to be situated at this location, the Chelsea Pump Station was reconstructed in 1965-66 under drought emergency circumstances and operated for approximately ten months during that period. It was placed on standby status until 1981. In that year, again under drought conditions, the station was rehabilitated to full operating capacity.

The City has submitted an application for a five-year permit to NYSDEC to operate the pump station on an emergency basis at the maximum rate of 100 mgd. Operation of the Chelsea Pumping Station also requires a

State Pollutant Discharge Elimination Systems ("SPDES") permit. However, the City may operate the Chelsea Pump Station in the event of drought emergency without the issuance of the SPDES permit, providing the City continues to pursue its application for such permit and satisfies interim conditions set by NYSDEC. The City is in the process of updating its environmental assessment of the Chelsea Pump Station.

*Water Transmission*

The System's water supply is transported through an extensive system of tunnels and aqueducts. (See "New York City Water Tunnels" map before the Appendices for the location of the major water transmission facilities.) Croton System water is delivered from the New Croton Reservoir by the New Croton Aqueduct to the Jerome Park Reservoir in The Bronx. From Jerome Park Reservoir and from direct connections to the New Croton Aqueduct, trunk mains carry water to the service area. The Catskill and Delaware Aqueducts convey water from Ashokan Reservoir and Rondout Reservoir to Kensico Reservoir and then to Hillview Reservoir in Yonkers. Both Kensico and Hillview Reservoirs serve as balancing reservoirs. Water from the Catskill and Delaware Systems is mixed in the Kensico Reservoir, and is conveyed to Hillview Reservoir where water enters Tunnels 1 and 2. Trunk mains carry water from tunnel shafts and from the distribution facilities (Jerome Park and Ridgewood Reservoirs and Silver Lake Tanks) (the "Distribution Facilities") to the service area. These trunk mains are usually more than 20 inches in diameter.

**Water System Tunnels and Aqueducts**

<u>Tunnels and Aqueducts</u>	<u>Connections</u>	<u>Length (miles)</u>	<u>Diameter (feet)</u>	<u>Transmission Capacity (mgd)</u>	<u>In-service Date</u>
<b>Tunnels Upstate</b>					
Shandaken .....	Schoharie to Ashokan	18.1	11.5 x 10.25	650	1924
West Delaware .....	Cannonsville to Rondout	44.0	11.33	500	1964
East Delaware .....	Pepacton to Rondout	25.0	11.33	700	1955
Neversink .....	Neversink to Rondout	6.0	10	500	1954
<b>Aqueducts</b>					
New Croton .....	New Croton to Jerome Park	24.0	13.5 x 13.6	300	1893
	Jerome Park to the 135th St. Gatehouse				
Catskill .....	Ashokan to Kensico	75.0	17 x 17.5	610	1915
	Kensico to Hillview	17.0	17.5 x 18	800	1915
Delaware .....	Rondout to West Branch	44.2	13.5	890	1944
	West Branch to Kensico	27.2	15	1,045	1943
	Kensico to Hillview	13.6	19.5	1,450	1942
<b>Tunnels-Downstate</b>					
Tunnel 1 .....	Hillview to distribution system	18.0	15-11	1,000	1917
Tunnel 2 .....	Hillview to distribution system	20.0	17-15	1,000	1936
Richmond Tunnel .....	Tunnel 2 to Staten Island	5.0	10	350	1970
	Uptake Shaft				

*The New Croton Aqueduct:* The New Croton Aqueduct transmits water by gravity from New Croton Reservoir to Jerome Park Reservoir in The Bronx. Water is also drawn from the New Croton Aqueduct directly into distribution mains in the City. It is a grade tunnel about 33 miles long with a delivery capacity of about 300 mgd. The New Croton Aqueduct is located three to 300 feet underground and is composed of two sections. One section is a bricklined rock tunnel located near the Old Croton Dam, three miles north of the New Croton Dam, and extends to Gatehouse No. 1 in Van Cortlandt Park, a distance of about 24 miles. The other section is a pressurized masonry conduit extending from Gatehouse No. 1 to a gatehouse at 135th Street and Convent Avenue in Manhattan, a distance of about nine miles. In addition, a branch of the New Croton Aqueduct transmits water from Gatehouse No. 1 to the Jerome Park Reservoir.



*The Catskill Aqueduct:* The Catskill Aqueduct, which also transmits water by gravity, is 92 miles long and extends from the Ashokan Reservoir to Kensico and Hillview Reservoirs. Four distinct types of aqueduct construction were required due to the terrain between the Catskill Mountains and the City. The Catskill Aqueduct is for the most part a 17 feet high by 17.5 feet wide horseshoe-shaped cut-and-cover conduit. The Catskill Aqueduct is also composed of a number of steel pipe siphons and grade and pressure tunnels where topography requires. A deep rock tunnel siphon 14 feet in diameter and 1,114 feet below mean sea level crosses beneath the Hudson River near Cornwall. The delivery capacity of the Catskill Aqueduct from the Ashokan Reservoir to the Kensico Reservoir is about 610 mgd and about 800 mgd from the Kensico Reservoir to the Hillview Reservoir. The Catskill Aqueduct passes under the New Croton Reservoir. At this point it is possible to transfer water from Ashokan Reservoir to New Croton Reservoir.

*The Delaware Aqueduct:* The Delaware Aqueduct similarly transmits water by gravity from Rondout Reservoir to West Branch Reservoir, in the Croton System, and from West Branch Reservoir to Kensico Reservoir and to Hillview Reservoir. The Delaware Aqueduct is a circular, cement-lined, pressurized, bedrock tunnel 85 miles long located 300 to 1,000 feet underground, passing beneath the Hudson River at a depth of about 600 feet below sea level. Water in this aqueduct is directed by uptake and dwtake shafts to the Kensico and West Branch Reservoirs. The Delaware Aqueduct has a diameter of 13.5 feet to 19.5 feet. The capacity of the section from Rondout Reservoir to West Branch Reservoir is about 890 mgd and delivers water from the Rondout, Neversink, Pepacton and Cannonsville Reservoirs. Interconnection with the Catskill System is possible at both the Kensico and Hillview Reservoirs. The delivery capacity of the Delaware Aqueduct from West Branch to Kensico Reservoirs is about 1,045 mgd and about 1,450 mgd from Kensico to the Hillview Reservoirs.

DEP is currently conducting a program of reviewing and assessing the condition of the Rondout-West Branch Tunnel, which comprises a portion of the Delaware Aqueduct. The Rondout-West Branch Tunnel carries water 45 miles from the Delaware System under the Hudson River and into West Branch Reservoir. It has a capacity of 900 mgd and contributes 50% of New York City's water supply. A portion of the tunnel crosses a fractured rock formation which is potentially subject to greater stress than the deep rock tunnels located in the City. In addition, the Rondout-West Branch Tunnel is unique in that it attains the highest pressures in the Water Supply System requiring more maintenance than other tunnels in the System. Surface seepage has been detected in this area. DEP is in the process of retaining a professional engineering firm to evaluate soil and rock conditions along the Rondout-West Branch Tunnel, to locate and investigate the cause and extent of any seepage and to propose any remedies that might be necessary.

In general, the Delaware System continues to demonstrate a high degree of reliability after 55 years of continuous service. Nevertheless, DEP considers it prudent to conduct regular tunnel and aqueduct inspections and surveys to detect any problems that might arise so that corrective actions can be taken if needed. Recently, the Croton Aqueduct, the oldest component of the System, was dewatered and inspected. No serious problems were detected and only minor maintenance was required. DEP will conduct appropriate evaluations of the Rondout-West Branch Tunnel and recommend any necessary improvements to ensure continued long-term service.

*Tunnel 1:* From Hillview Reservoir, water from the Catskill and Delaware Systems is delivered into the City by a circular, cement-lined, pressurized, bedrock tunnel narrowing in diameter from 15 to 11 feet. Tunnel 1 is 18 miles in length and extends south from Hillview Reservoir through the West Bronx to Manhattan and Brooklyn. From two terminal shafts in Brooklyn, steel and standby cast iron pipelines extend into Queens and Staten Island, respectively. Tunnel 1 is 200 to 750 feet underground and thus avoids interference with streets, buildings, subways, sewers, pipes and other underground infrastructure. These depths are necessary to ensure substantial rock covering necessary to withstand the bursting pressure of the water inside and to ensure watertightness. Tunnel 1 has a capacity of approximately 1,000 mgd. Shafts placed along the tunnel connect with surface mains which deliver water to the distribution system.

*Tunnel 2:* The second tunnel also delivers Catskill and Delaware System water from Hillview Reservoir. It is a circular, cement-lined, pressurized, bedrock tunnel 200 to 800 feet below the street surface and 15 to 17

feet in diameter. Tunnel 2 extends south from Hillview Reservoir, east of Tunnel 1, through the Bronx, under the East River at Rikers Island, through Queens and Brooklyn, and connects with Tunnel 1 at Fort Greene Park as well as at State and Nevins Streets in Brooklyn. Tunnel 2 has a capacity of approximately 1,000 mgd and is 20 miles in length. Shafts placed along the tunnel connect with surface mains which deliver water to the distribution system.

*Richmond Tunnel:* Connecting to Tunnel 2 in Brooklyn is the 10-foot diameter, five-mile long Richmond Tunnel, which was completed in 1970 and carries water 900 feet beneath Upper New York Bay to Staten Island. The Richmond Tunnel, the Richmond Distribution Chamber, the Richmond Aqueduct and the underground Silver Lake Tanks were designed to improve the water supply facilities of Staten Island. The underground storage tanks (among the world's largest) have a combined capacity of 100 million gallons and replace the Silver Lake Reservoir (now Silver Lake).

*Tunnel 3:* A new water tunnel connecting the reservoir system to the City is presently under construction to enhance the adequacy and reliability of water transmission to the City in the future. The primary reasons for constructing Tunnel 3 are to:

- increase capacity to meet a growing demand in the eastern and southern areas of the City;
- permit inspection and rehabilitation of Tunnels 1 and 2; and
- provide water delivery alternatives to the City in the event of disruption in Tunnel 1 or 2.

Tunnel 3 is a circular, cement-lined, pressurized, bedrock tunnel which will be built in four stages which include:

Stage I tunnel construction is complete and it is expected to be operable in 1998. It has a 13-mile route which extends south from Hillview Reservoir in Yonkers under Central Park Reservoir in Manhattan, and east under the East River and Roosevelt Island to Long Island City in Queens. Stage I parallels Tunnel 1 along most of this route.

Stage II is currently under construction and will consist of two sections expected to be operable by the end of 2004. The Brooklyn/Queens section will extend from the end of Stage I to supply Queens, Brooklyn and the Richmond Tunnel. The second section will extend south from the valve chamber at Central Park into lower Manhattan. Completion of Stage II will further enhance the System's water distribution capability. Upon completion of this stage, Tunnel 1 or 2 can be closed for inspection.

Stage III will extend from the Kensico Reservoir to the interconnecting chamber of Stage I, south of Hillview Reservoir. Completion of this stage will supplement the delivery capability of both the Catskill and Delaware Aqueducts between Kensico and Hillview Reservoirs. Tunnel 3 will deliver water from Kensico Reservoir under greater pressure than is available in Tunnels 1 and 2. This increased pressure is a result of the higher elevation of Kensico Reservoir than that of Hillview Reservoir where Tunnels 1 and 2 originate.

Stage IV is intended to deliver additional water to the eastern parts of the Bronx and Queens. It would extend southeast from the northern terminus of Stage I in the Bronx to Queens and then southwest to interconnect with the Queens portion of Stage II.

#### *Water Distribution*

The water distribution system consists of a grid network of water mains ranging in size from six to 84 inches in diameter. It contains approximately 6,048 miles of pipe, 88,633 mainline valves and 103,661 fire hydrants. Some pipe was installed before 1870 and approximately 5.7% is over 100 years old. The following tables set forth distribution of pipe by size and age, based on the City's 1996 fixed asset inventory files. Totals may vary due to rounding.

### Water System Pipe Inventory: Diameter

<u>Diameter (inches)</u>	<u>Length (miles)</u>
6 .....	405
8 .....	2,610
12 .....	1,938
16 .....	170
20 .....	496
24 .....	52
30 .....	50
36 .....	74
48 .....	171
54 .....	1
60 .....	42
72 .....	40
84 .....	*
Total .....	<u>6,048</u>

\* Less than one-half mile in length

### Water System Pipe Inventory: Age

<u>Installation Year</u>	<u>Length (miles)</u>	<u>Percent of System</u>
Pre-1870 .....	53	0.9%
1870-1879 .....	202	3.3
1880-1889 .....	90	1.5
1890-1899 .....	253	4.2
1900-1909 .....	462	7.6
1910-1919 .....	899	14.9
1920-1929 .....	1,020	16.9
1930-1939 .....	695	11.5
1940-1949 .....	444	7.3
1950-1959 .....	573	9.5
1960-1969 .....	498	8.2
1970-1979 .....	295	4.9
1980-1989 .....	222	3.7
1990-1996 .....	342	5.7
Total .....	<u>6,048</u>	<u>100.0%</u>

Of the 6,048 miles of pipe in service, about 2,979 miles are unlined cast iron laid before 1930. Pipe laid between 1930 and 1969 is cement-lined cast iron and comprises about 2,210 miles of the Distribution System. Pipe laid after 1970 is cement-lined ductile iron and comprises about 859 miles of the Distribution System. The Distribution System also includes over 88,633 mainline valves, about 103,661 hydrants, four distribution facilities, 15 gatehouses, 15 pump stations, and eight maintenance and repair yards.

Since 1970, the material of newly installed pipe has been cement-lined, ductile iron and comprises about 14.3% of the water main mileage. Between 1930 and 1970, cement-lined, cast iron pipe was used and comprises about 36.5% of the water main mileage. Fewer than half of the mains in the System are unlined cast iron, the primary construction material used before 1930. The CIP provides for the programmatic replacement of water mains in accordance with certain established criteria. These criteria were reviewed and confirmed by the U.S. Army Corps of Engineers in their independent study of the City's distribution system completed in November 1988.

Water pressure is regulated within a range of 35 to 60 pounds per square inch ("psi") at street level. Generally, 40 psi is sufficient to supply water to the top of a five or six-story building. About 95% of the total consumption is normally delivered by gravity. It is necessary to pump only the remaining 5% to areas of higher elevation to keep the pressure within this desired range.

The distribution system in each Borough is divided into three or more zones in accordance with pressure requirements. These zones are determined chiefly by the local topography. The ground elevation in the City varies from a few feet above sea level, along the waterfront, to 403 feet at Todt Hill in Staten Island. The highest ground elevations in the other Boroughs are: Manhattan, 267 feet; the Bronx, 284 feet; Brooklyn, 210 feet; and Queens, 266 feet. Various facilities provide storage to meet the hourly fluctuations in demand for water throughout the City, as well as any sudden increase in draft that might arise from fire or other emergencies. With the exception of some communities in the outlying areas of the City which may experience low pressure service in peak hours during summer months, the water distribution system provides generally excellent service.

According to Metcalf & Eddy, overall the distribution system is judged to be in adequate condition (the highest rating category) based upon evaluation of key water system parameters: water main breaks, pressure tests, flow tests and leak detection. Based on studies conducted by the U.S. Army Corps of Engineers in 1988 on the fewest pipeline breaks per 1,000 miles, the distribution system has the fourth-lowest number of such breaks of 17 major United States cities. With few exceptions, all areas served by the distribution system enjoy reliable water supply service at adequate pressure. During peak flow periods, low and inadequate pressures may exist in certain areas of the City. Parts of Staten Island, the Co-Op City complex in the Bronx and the Starrett City complex in Brooklyn require improvements either to provide greater pressure or redundant feeds to improve reliability. Growth and development resulting in increasing water demands in Staten Island also require that provision be made to supply more water to that Borough in the near future. The 48-inch trunk main currently under construction from the Richmond tanks will improve water circulation, thus improving Staten Island's water pressure and system reliability. A design contract associated with Co-Op City is currently in progress, to be followed by construction within the next two years. Problems associated with the Starrett City complex will be alleviated by construction, including the installation of a 60-inch trunk main, which is now underway. The CIP as revised by the Current Capital Plan includes over \$459 million for 204 miles of trunk and distribution main replacement and over \$227 million for 116 miles of trunk and distribution main extension.

### *Water Quality*

Because of the quality of the System's water and the long periods of retention in the reservoirs, it has not been necessary to filter water from the System to reduce the bacterial content and the turbidity. The only treatment procedures routinely employed by DEP are screening, detention, addition of caustic soda for pH control, chlorination for disinfection, and fluoridation. Additions of copper sulfate for algae control and alum for turbidity control are made only when needed.

Until recently, this level of treatment had proven to be more than sufficient to maintain water quality standards throughout the entire Water System. Population growth and commercial and industrial development within the Croton watershed, the Water System's oldest, have adversely affected long-term water quality and led to a 1992 stipulation with NYSDOH which provides for the construction of a full scale water treatment facility to filter Croton System water. The stipulation requires the facility to be operational by the end of 1999 and DEP has proposed an extension of this deadline.

The United States filed suit against the City and DEP in the U.S. District Court, Eastern District of New York pursuant to SDWA. The complaint alleges that the City violated the SWTR by not providing filtration for the Croton System by June 29, 1993, and that the City has been in violation of the SDWA and the SWTR since that date. The complaint requests that the Court order the City to design, construct and operate a Croton filtration plant on an expeditious schedule, and to comply with filtration, disinfection, monitoring and reporting requirements. In addition, the United States seeks civil penalties of up to \$25,000 for each day of violation of

the SWTR or the SDWA occurring prior to January 31, 1997, and up to \$27,500 for each day of violation occurring on or after January 31, 1997 (along with awarding the United States its costs in the action).

The State of New York, with the consent of the City and the United States, intervened as a plaintiff in the action brought by the United States. The State alleges that the City has violated the State Sanitary Code and the terms of the 1992 stipulation. The State is seeking an order directing the City to design, construct and operate a Croton filtration plant on an expeditious schedule. The State is not seeking any penalties.

The City's position is that penalties are not warranted and should not be assessed by the Court in this action. Based on the City's past experience with enforcement actions of this type, the City expects that, if penalties are paid in connection with this matter, the amount thereof will be substantially less than the amount which the complaint in this action seeks. The City intends to defend this action vigorously, while at the same time continuing its discussions with USEPA and NYSDOH in an effort to reach a negotiated agreement on a modified timetable.

The City operated a treatment technology assessment and demonstration facility for Croton System water at Jerome Park Reservoir from March 1989 to July 1992. The CIP provides for an increase in the cost of the Croton Filter Project from \$549 million to \$828 million. The funds forecasted for this Project in the CIP reflect an expected operational date of December 31, 2007.

DEP has historically monitored key locations representative of its distribution system for over 40 individual water quality parameters. These special monthly analyses include analyses for lead. Current DEP data indicate that lead is absent from both the water supply and distribution systems. Recent USEPA regulations require water suppliers to monitor for lead and copper that may have leached into the water from interior building plumbing. To minimize this occurrence the City began the addition of blended orthophosphate to the Water System. This addition promotes the formation of a protective coating inside pipes and plumbing thereby reducing the leaching of metals. Recent monitoring indicates lead and copper levels now fall below the regulatory requirements.

The System has five laboratories that monitor water quality, employing 250 bacteriologists, engineers, chemists, hydrologists and limnologists. Over 80,000 samples per year are collected and 1,000,000 analyses are performed annually. Routine checks are made for more than 60 different substances, including heavy metals and trace organics. As part of a long range water quality and watershed protection program, DEP has increased its staff in order to expand water quality monitoring within watershed and distribution areas and to improve its sample collection force. DEP has initiated an approximately \$7 million capital program to install drinking water quality sampling stations throughout the City which will largely be completed in Fiscal Year 1998. The monitoring program meets or exceeds Federal and State requirements and has the capability to meet potentially more stringent requirements.

#### *Drought Response Measures*

From time to time the Water System experiences drought conditions caused by significantly below-normal precipitation in the watershed areas. Since the Water System relies upon a surface water supply, it is sensitive to major fluctuations in precipitation. Throughout even the worst droughts, the Water System has continued to supply sufficient amounts of water to the City.

To ensure adequate water supply during drought conditions, DEP, in conjunction with other City, State and interstate agencies, maintains a Drought Contingency Plan. The Drought Contingency Plan defines various drought phases that trigger specific management and operational action. Three defined phases are: "Drought Watch", "Drought Warning", and "Drought Emergency". A Drought Emergency is further subdivided into

four stages based on the projected severity of the drought and provides increasingly stringent and restrictive measures.

A Drought Watch is declared when there is less than a 50% probability, based on the existing record since 1927, that either the Catskill or Delaware reservoir system will be filled by the following June 1. This phase initiates the pumping of water from the Croton System. In addition, a public awareness program is begun and all users, including upstate communities taking water from the System, are requested to initiate conservation measures. Discussions with NYSDOH, NYSDEC, the Delaware River Basin Commission (the "DRBC") and City agencies are held concerning their prospective participation in the event of a declaration of a "Drought Warning".

A Drought Warning is declared when there is less than a 33% probability that either the Catskill or Delaware reservoir system will fill by June 1. Limited restrictions on water usage are mandated. All previous efforts are continued or expanded and additional programs are initiated, including City conservation programs and expanded leak detection.

A Drought Emergency is declared when it becomes necessary to reduce consumption by imposing even more stringent measures. Major components of the Drought Emergency phase of the Drought Contingency Plan are set forth below.

Stage I Mandates include 15% reduction in water consumption based on prior year usage for non-residential users; restriction on watering of lawns, gardens and golf courses to a maximum of four hours on alternate days during specific hours; and \$500 fine for unauthorized use of a fire hydrant.

Stage II Mandates include a ban on lawn watering; a ban on the filling of private swimming pools; restricted use of water-cooled air conditioners, requiring a two-hour shut-down between 8 AM and 10 AM or 4 PM and 6 PM; and an additional 5% reduction in water consumption for non-residential users.

Stage III Mandates include additional restrictions on the use of water-cooled air conditioning systems, prohibiting temperatures below 78°F; and an additional 5% reduction in water consumption for non-residential users.

Stage IV Mandates include installation of flow restricting devices on plumbing fixtures; and an additional 5% reduction in water consumption for non-residential users.

In addition to the imposition of restrictions, DEP may enhance existing System management and public awareness programs, expand its inspection force and perform additional leak and waste surveys in public and private buildings. DEP may also require communities outside of the City that are served by the System to adopt similar conservation measures. The Chelsea Pump Station may also be brought into service in order to draw Hudson River water into the System.

### **Governmental Regulation**

The System is subject to Federal, State, interstate and municipal regulation. At the Federal level regulatory jurisdiction is vested in USEPA; at the State level in the NYSDEC and the NYSDOH; at the interstate level in the Delaware River Basin Commission ("DRBC") and the Interstate Sanitation Commission (the "ISC"); and at the municipal level in DEP, NYCDOH, DOB, the Department of Business Services (the "DBS") and, to a limited degree, in municipalities and districts located in eight counties north of the City.

*Long-Term Water Supply Planning.* In July 1985, the City formed an intergovernmental task force to study the water supply needs of the Southeast region of New York State. It issued its first interim report in February 1986, entitled "Increasing Supply, Controlling Demand." The report recommended that consumption studies be performed to refine water use projections and that every reasonable effort be made to control water demand through increased metering, rate setting, leak detection and conservation. In the event additional water supply is required in the future, the final report of the task force concluded that expanded pumping of Hudson River water

represents the only large source of supplemental supply which can be realistically developed within the next 10 to 15 years. However, based on the results of metering, toilet replacement, leak detection, public information and other existing conservation programs achieved to date and expected in the future, it is projected that no additional water sources will be necessary for the next fifty years.

A universal metering program was adopted by the Board and the City in 1986 and began in Fiscal Year 1988. Full implementation of metering for all customers of the System is expected to be substantially completed by the end of 1998.

The City has virtually completed a program to replace older toilets using 6 to 8 gallons per flush with low-flow toilets using 1.6 gallons per flush. As of June 30, 1997, approximately 1.33 million toilets had been replaced, and virtually all installations had been completed. The City has expended \$300 million on this program. To qualify for this program, homeowners were required to replace shower heads with low-flow fixtures and to agree to an inspection. Conservation measures implemented to date have achieved a reduction in daily consumption estimated to equal 100 mgd. Continued implementation of these measures is expected to further reduce consumption.

*Long-Term Watershed Protection.* In addition to the monitoring program, DEP staff conduct regular inspections of pollution sources in the watershed and maintain constant surveillance of the watersheds. To ensure high quality water, DEP has promulgated and NYSDOH has approved new watershed protection regulations for the upstate watershed area. These regulations are designed to prevent future contamination of the New York City water supply and became effective May 1, 1997. See "GOVERNMENTAL REGULATION—Water Supply Regulation—Federal". Additionally, the System includes real estate adjacent to its reservoirs acquired to prevent potential water contamination from pollutants that would be produced if these areas were developed and to control access to the reservoirs. To enhance these efforts, DEP continues to work in conjunction with State programs to better protect watershed wetlands which act as a filter to general land use pollution which would otherwise be deposited in the reservoirs. DEP's watershed projects include: data collection and communication with the State to effect watershed classification upgrading; review of and comment on state water protection regulations; and water quality and land use studies. The City expects to spend \$260 million for the purchase of land in the watershed to protect the quality of the water supply, of which \$250 million is included in the CIP. DEP will commit to invest \$45.2 million to upgrade the last two of its own sewage treatment plants in the watershed. The CIP contains approximately \$1.4 billion for construction and improvements in the City's upstate water supply systems.

Additional watershed protection programs include cooperative projects with farmers in which DEP shares in the cost of implementing specified best management practices to reduce pollution, and cooperative projects with localities in which DEP provides technical and financial assistance to upstate towns and counties for water quality protection.

The System includes eight City-owned upstate sewage treatment plants to prevent untreated sewage from being released into the watersheds. To enhance watershed protection, the CIP includes funds for upgrading these facilities. DEP, through the City's Law Department, is taking legal action pursuant to the Federal Clean Water Act to compel certain owners and operators of non-City owned sewage treatment plants in the watersheds to comply with SPDES permits. In addition, DEP, together with the City Law Department, is taking legal action to ensure that new developments are appropriately designed to be environmentally protective. In September 1993, NYSDOH issued a declaratory ruling that, under certain specified circumstances, the City would be required to pay for various expenses associated with the construction of, or modifications to, or the operation and maintenance of public sewage treatment plants in the watershed which are solely attributable to changes compelled by the City's watershed regulations. The ruling was upheld by the State Supreme Court, Albany County in June 1994. In August 1994, the City appealed the Supreme Court's ruling to the Appellate Division, Third Department. As part of the Memorandum of Agreement, discussed below, the City has agreed that it will withdraw its appeal of the ruling after the adoption by NYSDOH of the City's new watershed regulations as State regulations which NYSDOH is in the process of doing.

DEP is undertaking a new initiative to develop a computerized watershed modeling system which will enable DEP to evaluate better the effects of land development on water quality.

Most of the watershed protection programs described above are required pursuant to a determination issued by the USEPA on May 6, 1997, pursuant to which the City is not required to filter water from the Catskill and Delaware systems until the earlier of April 15, 2002 or the time a further determination is made. The May 6, 1997 determination is the third extension of a filtration avoidance determination first issued by EPA in January 1993. For further information relating to the determination, see "THE SYSTEM—Government Regulation—Water Supply Regulation—Federal".

On January 21, 1997, the City and the State executed a Memorandum of Agreement with the communities in the Catskill, Delaware and Croton watersheds, USEPA and several environmental groups. The Memorandum of Agreement supplements the City's existing watershed protection program with approximately \$400 million in additional funding. This funding, at least \$290 million of which is expected to be provided through the issuance of Authority bonds, consists of \$350 million for an economic-environmental partnership program with upstate communities which includes a water quality investment program, a regional economic development fund and a regional advisory forum for water quality initiatives and watershed concerns, and an additional \$60 million for land acquisition. The Memorandum of Agreement calls for the State's issuance of a land acquisition permit to the City and for State approval of the City's revised rules and regulations governing certain aspects of land use in the watershed. The land acquisition permit was issued on January 21, 1997 and the regulations became effective on May 1, 1997. The State has also agreed to promulgate the same regulations under state law procedures. The estimated cost of the Memorandum of Agreement is expected to increase average bills paid by customers by less than 2% through 2001.

#### *Water Supply Regulation*

*Federal.* Pursuant to the SDWA, USEPA has promulgated nationwide drinking water regulations which specify the maximum level of harmful contaminants allowed in drinking water and which govern the construction, operation, and maintenance of the System.

Under 1986 amendments to SDWA, the USEPA is directed to promulgate filtration treatment regulations "relevant to the protection of health" which shall be used by the State to identify public water systems supplied by surface water sources which must initiate filtration measures. The regulations, known as the SWTR, prescribe guidelines concerning studies to be performed, programs to be implemented, timetables to be met and any other actions necessary to insure compliance with the regulations' terms. USEPA published a final SWTR in June 1989. With respect to the Catskill and Delaware systems, the City believes that under the SWTR promulgated by the USEPA it will continue to be able to meet the criteria for non-filtered supplies. See "THE SYSTEM—The Water System—Water Quality".

In January 1997, USEPA issued an interim determination pursuant to which the City is not required to filter water from the Catskill and Delaware systems. As described above, on May 6, 1997 USEPA extended this determination to April 15, 2002 or until a further determination is made, whichever is earlier. Preliminary estimates of the costs of such filtration are from \$4 billion to \$8 billion. The determination contains a number of conditions which the City is required to satisfy to ensure that the City would continue to be relieved of requirements for filtration. One of those conditions is that the City solicit property from owners of 355,050 acres of land in the watershed and actually acquire (with certain limited exceptions) any land used to satisfy the solicitation goal where the owner accepts the City's purchase price. To be eligible for acquisition, land must satisfy specified natural features and minimum acreage criteria. The City will set aside \$250 million for the acquisition program, which may be increased by \$50 million after five years upon a review of the City's progress with the program. NYSDEC has issued a renewable ten-year land acquisition permit to the City and the governmental entities which had opposed the permit, including a coalition of watershed towns, have withdrawn their opposition. The City has obtained options to purchase land in the watershed valued at approximately \$12.7



million and has included in the CIP \$250 million for the purchase of land in the Catskill and Delaware watersheds and \$10 million for land in the Croton watershed.

The January 1997 interim determination also required that new City land use regulations relating to the watershed be in effect within 90 days from the effective date of the Memorandum of Agreement. NYSDOH has approved a modified set of land use regulations, which became effective on May 1, 1997. The governmental entities which had opposed the regulations, including a coalition of watershed towns, have agreed to the modified regulations.

In addition, the May 1997 determination contains milestones for the upgrading of City-owned treatment plants in the watershed. Some of these deadlines were extended from the deadlines originally set by USEPA. DEP expects that construction of the upgrades will be completed by or shortly after the deadlines.

In general, implementation of the determination is the subject of ongoing discussions with USEPA. For additional information relating to the watershed protection program, see "THE SYSTEM—The Water System—Long-Term Watershed Protection".

The land use regulations referred to above are a major component of the City's efforts to protect its water supply. These regulations, which were adopted pursuant to the New York State Public Health Law and which have NYSDOH approval, are designed to prevent future contamination of the System's water supply. The City believes that its increased regulatory efforts to protect its water supply will preserve the high quality of the water in the Catskill and Delaware watersheds and will avoid the need for filtration.

A coalition of towns located in the upstate watershed has commenced litigation alleging deficiencies in the environmental review process undertaken in connection with the City's filtration avoidance application to USEPA, the regulations proposed by the City in 1993 and the City's original land acquisition program in the upstate watershed. As part of the watershed agreement, the coalition has agreed to withdraw the litigation after NYSDEC issues a land acquisition permit, which NYSDEC has done, and NYSDOH adopts the land use regulations as State regulations, which NYSDOH is in the process of doing. For additional information regarding litigation relating to filtration avoidance measures, see "LITIGATION".

In November 1994, approximately 45 property owners in the upstate watershed commenced litigation seeking damages of approximately \$10.5 billion in the aggregate for alleged diminution in the value of their property caused by an alleged chilling effect on the real estate market from the City's watershed regulatory program. On June 24, 1997, the trial court, among other things, denied the City's motion to dismiss the case. The City has appealed the court's decision. For more detailed information, see "LITIGATION".

*State.* Enforcement of SDWA and its related regulations, except for the SWTR, was delegated by USEPA to the State. Consistent with the terms of SDWA, the State has been delegated primary enforcement responsibility for public water systems since USEPA has determined that the State's drinking water regulations are at least as stringent as the Federal drinking water regulations. Enforcement of the water quality mandates for the most part has been entrusted to NYSDOH. The Sanitary Code also sets forth surveillance, quality testing and water treatment requirements. Also set forth in the Sanitary Code are the procedures for planning, facility siting, facility operation and the granting by NYSDOH of variances and exemptions. See "THE SYSTEM—The Water System".

NYSDOH also sought the authority to administer and enforce the SWTR in the same way it administers the rest of the SDWA. Although this authority was initially granted, it was revoked after a lawsuit by a group of upstate towns raised procedural flaws. On June 3, 1997, USEPA again delegated primary enforcement responsibility for the SWTR to NYSDOH for all systems in the State other than the Catskill and Delaware Systems. As part of the Memorandum of Agreement, USEPA agreed to delegate primary enforcement responsibility for the SWTR to NYSDOH for the Catskill and Delaware Systems effective May 15, 2007.

Pursuant to the 1905 Act, the City was granted permission to develop areas of the Catskill Mountains, located in the Hudson River Basin, for additional sources of pure water. Subsequent amendments to the 1905 Act extended the City's development rights to portions of the Delaware River Basin located to the west of the

Catskill Mountains, provided that no additional water storage structure or reservoir could be built within the drainage area of the Esopus Creek in Ulster County.

In return for these development rights, the 1905 Act and subsequent amendments require the City to furnish, upon request, supplies of fresh water to municipalities and water districts in eight northern counties in which City water supply facilities and watersheds are located. The City's obligations under the 1905 Act in this respect have now passed to the Board.

The 1905 Act also governs the provision of fresh water to the northern counties and the rates that may be levied for such water. An eligible municipality or district may draw water based on a formula computed as the local population multiplied by the daily per capita consumption in the City. Current water allowances are based upon 1990 U.S. census data. In the event of disagreement between the upstate users and the System as to appropriate water charges, NYSDEC has the authority to fix the water charges based on the actual total cost of the water to the City, deducting those costs incurred by the City itself for distributing water to City residents.

The Water System is currently furnishing water to users in portions of four of the eight eligible northern counties. The Water System provides approximately 85% of the water used in Westchester county and approximately 7.5% of the water used in Putnam, Orange and Ulster counties. In the future, other eligible municipalities and districts may exercise their option to utilize Water System water. The City is required under the Act to provide water at regulated rates to eligible municipalities and districts up to an amount based on the above-described formula.

NYSDEC has promulgated regulations which require release of fresh water from most of the Water System's reservoirs into downstream water bodies, to protect fisheries and to enhance recreational use of rivers and streams in the System's watersheds and drainage areas. The regulations recognize seasonal variations and, with insignificant exceptions, releases for recreational purposes are effectively suspended during periods of drought.

NYSDEC also oversees a dam safety program in connection with the System's dams located east of the Hudson River (Croton System and Kensico Reservoir). The first phase initiated under the National Dam Inspection Act included inspection by the U.S. Army Corps of Engineers of all of the System's dams. That study indicated that the dams in the Delaware and Catskill Systems were in excellent operating condition and that the dams east of the Hudson were safe but in need of some rehabilitation and reconstruction work. The second phase, administered by the City and subject to NYSDEC approval, assessed the measures needed to restore the dams east of the Hudson River to first-class operating condition.

*Interstate.* Three major interstate actions have influenced the maintenance and operation of the Delaware System.

The conditions under which the System's Pepacton, Neversink and Cannonsville Reservoirs may be operated are set forth under the terms of a 1954 decree of the Supreme Court of the United States (the "1954 Decree"). It allows the System to divert 800 mgd of water from the Delaware River Basin for use by the Water System. At the same time, the System is required to release, from the three reservoirs into the tributaries of the Delaware River, quantities of water sufficient to maintain flows of 1,750 cubic feet per second in the main branch of the Delaware River at Montague, New Jersey. In addition, the System must meet the State-mandated conservation releases and flow requirements in various tributaries contained in numerous deeds and condemnation decrees. Enforcement of the 1954 Decree is under the jurisdiction of a River Master appointed by the Supreme Court of the United States. The City and State, and the governments of New Jersey, Pennsylvania and Delaware are named parties to the 1954 Decree.

DRBC was created in 1961 as a result of the Delaware River Basin Compact among the Federal Government, the State, and the states of New Jersey, Pennsylvania and Delaware. It has jurisdiction over water resources and is responsible for development, planning and coordination and protection of the interstate areas

served by the Delaware River and its tributaries. Although not a participant in the Delaware River Basin Compact, the City functions as an advisor to the State in DRBC proceedings and assumes a major role both as a party to the 1954 Decree and as the owner and operator of the three largest reservoirs subject to DRBC jurisdiction.

In 1982, as a result of conditions during the drought of record in the mid-1960's, the drought of 1981, and the inability of the System's Pepacton, Neversink and Cannonsville Reservoirs to satisfy all of the requirements of the 1954 Decree during those drought periods, a set of Interstate Water Management Recommendations (the "Good Faith Agreement") was submitted to DRBC. Executed by all of the parties to the 1954 Decree, the Good Faith Agreement sets forth a series of recommendations, including various levels of diversions and releases necessary during normal hydrological conditions and during periods of drought. The Good Faith Agreement was followed during the 1985 and 1989 droughts.

*Municipal.* Water quality standards are enforced within the watershed areas north of the City through a network of overlapping governmental jurisdictions. Participating in that network, among others, are NYSDEC and NYSDOH, county, municipal and district police, engineers and inspectors; and City personnel from DEP. The various jurisdictions maintain physical security, take water samples, monitor the use of herbicides, insecticides and fertilizers, and generally oversee the physical condition of, activity on and the operation of water supply lands and facilities. Portions of the overall legislative and regulatory framework governing the watersheds may be found in the City's Administrative Code, Health Code and Water Supply Regulations.

Regulatory enforcement within City limits is almost exclusively accomplished through City personnel. Provisions incorporating and augmenting the substance of SDWA, related regulations and the Sanitary Code, are contained in the Health Code, Water Supply Regulations and the City's Building and Building Construction Codes. These provisions are enforced by personnel from DEP, NYCDOH and DOB.

### **The Sewer System**

The Sewer System is comprised of the sewage collection system and the sewage treatment facilities. (See "New York City Drainage Areas and Sewage Treatment Plants" map before the Appendices for the location of the sewage treatment facilities.)

#### *History*

Systematic collection of sewage and building of sewers began in the City as early as 1696. Major portions of the Sewer System in lower and central Manhattan were begun in the early 1830's and completed by 1870. The oldest sewer now in service was built in 1851. The oldest components of the Sewer System, located in Manhattan and Brooklyn, are constructed mostly of brick, clay and cement. The other Boroughs have newer sewers made primarily of vitreous clay and concrete. Historically, waste collection and disposal was a matter of local jurisdiction. Upon consolidation of the City in 1898, Presidents of the five Boroughs were given responsibility for sewage collection and disposal in their respective Boroughs. A Commissioner of Borough Works was established in each Borough for planning, constructing and administering its sewer system. This local responsibility for sewage collection existed until the mid-1960's.

Although water pollution control did not become a major issue until recent years, it has been a concern of local conservationists and public officials for almost a century. The first sewage treatment facility in the City was opened in 1886, when a small plant was constructed on Coney Island to protect the bathing beaches. In 1904 a Sanitary Commission was established and charged with developing a master plan for sewage treatment in the City. Although the Sanitary Commission completed its task in 1910, sewage treatment plant construction did not receive serious attention until 1929, when the City established a department to construct sewage treatment facilities under the jurisdiction of the Department of Sanitation. In the 1930's this function was transferred to the Department of Public Works. In 1931 a plant construction program was begun to construct a system of sewage treatment plants and associated facilities to control and treat all sewage produced within the City. The first of

these plants, Coney Island, opened in 1935. Three more large plants, Wards Island, Tallmans Island and Bowery Bay, were placed in operation before the end of the 1930's. During the 1940's two additional plants, Jamaica and 26th Ward, were opened. The post-war years witnessed an intensified construction effort and, by 1967, 12 major treatment plants were in operation treating about 1,000 mgd at an average removal efficiency of about 65%. At that time most other urban areas were providing only about 35% removal efficiency.

The City Charter of 1963 consolidated the Borough sewer organizations into a City-wide department under the Department of Public Works. In 1968 various municipal services were consolidated into a single agency known as the Environmental Protection Administration ("EPA"), which included responsibility for sanitation and water and air quality resources. Within EPA, the Department of Water Resources had jurisdiction over the Bureaus of Water Supply and Water Pollution Control. These Bureaus were responsible for water supply and sewage collection and treatment. In 1977, water supply, sewage collection and treatment, and air quality monitoring responsibilities were combined into DEP.

### *Sewage Collection*

The sewage collection system is divided into 14 drainage areas and includes 6,417 miles of sewer pipes of varying size which are classified as one of three types: sanitary, storm or combined. Sanitary sewers accommodate household and industrial waste. Storm sewers carry rainwater and surface water runoff. Combined sewers carry both types of waste. Approximately 70% of the City's sewers are of the combined type. In addition to the sewage pipes, 90,000 catch basins and 5,000 seepage basins are maintained to prevent flooding and sewer backups.

The Sewer System is comprised of a number of sewer facilities built to varying standards. Different materials and methods of construction were used resulting in different life cycles. Approximately 4,000 miles or two-thirds of the City's sewer pipe is made of vitreous clay. Significant mileage of sewer pipe is composed of other building materials including cement, reinforced concrete, iron and brick.

Infiltration/Inflow studies indicate that infiltration rates in the Collection System are relatively low when compared with the national average. In addition to the results of Infiltration/Inflow studies prepared by consultants, extensive data is available from complaint records and in-house studies assessing the adequacy of system service. This information is considered when developing capital projects. Currently programs are underway to replace cement pipe sewers in Brooklyn and reline brick sewers in Manhattan.

Some pipe in the collection system was installed before 1870, and about 6.3% of all sewer pipe in the collection system is over 100 years old. The following table sets forth an inventory of sewer pipe by hydraulic diameter based on the City's 1996 fixed asset inventory files. (The hydraulic diameter of a given pipe is the diameter of a circular pipe with the same cross-sectional area.)

### **Collection System Pipe Inventory: Hydraulic Diameter**

<b>Hydraulic Diameter (inches)</b>	<b>Length (miles)</b>
6-10.....	1,898
11-13.....	1,689
14-19.....	963
20-29.....	369
30-39.....	483
40-49.....	383
50-59.....	91
60-89.....	296
over 90.....	247
Total.....	<u>6,417</u>

The sewer pipe inventory by age as of June 30, 1996 is shown in the following table:

**Collection System Pipe Inventory: Age**

<u>Installation Year</u>	<u>Length (miles)</u>	<u>Percent of System</u>
Pre-1870 .....	204	3.2%
1870-1879 .....	81	1.3
1880-1889 .....	116	1.8
1890-1899 .....	670	10.4
1900-1909 .....	489	7.6
1910-1919 .....	714	11.1
1920-1929 .....	1,010	15.8
1930-1939 .....	984	15.3
1940-1949 .....	591	9.2
1950-1959 .....	588	9.2
1960-1969 .....	438	6.8
1970-1979 .....	224	3.5
1980-1989 .....	121	1.9
1990-1996 .....	186	2.9
Total .....	<u>6,417</u>	<u>100.0%</u>

Metcalf & Eddy has concluded that overall the collection system is in adequate condition (the highest rating category) based on their independent evaluation. See "APPENDIX A—LETTER OF METCALF & EDDY, CONSULTING ENGINEERS". These studies have been completed for 13 of the 14 drainage areas and indicate that infiltration rates in the collection system are relatively low compared to similar systems. In addition to the results of Infiltration/Inflow studies prepared by consultants, the Bureau of Water Supply and Wastewater Collection has extensive data available from in-house studies assessing the adequacy of pipelines. This information is considered when developing capital projects. Maintenance yards in the Collection System are generally adequate for their purpose. Minor repair work and relocation of these yards is planned to correct deficiencies. Some sewer maintenance equipment is at or has exceeded its useful life and is scheduled for replacement.

In recent years the Bureau of Water Supply and Wastewater Collection has undertaken an extensive review of sewer service throughout the City. This review has led to the inclusion of two sewer construction programs in the CIP. The first program addresses the augmentation of sewer lines in areas of the City which are undergoing rapid development or where land use patterns have changed. The second program will provide sewers in areas which are not presently served. In total the CIP includes over \$1.3 billion to replace or extend over 488 miles of sewers.

*Sewage Treatment Facilities*

The facilities related to the treatment of sewage include 14 sewage treatment plants, one storm-overflow retention plant, 89 wastewater pump stations, nine laboratories, eight sludge dewatering facilities and three inner-harbor vessels which transport sludge between facilities. Sludge is a by-product of the sewage treatment process. Metcalf & Eddy has concluded that overall the condition of the Wastewater Treatment System is judged to be adequate (the highest rating category). See "APPENDIX A—LETTER OF METCALF & EDDY, CONSULTING ENGINEERS".

Issues of both water supply volume and consequent sewage treatment volume are raised from time to time in connection with the System. As is noted herein, measures to increase the supply of water available to the System and to increase the sewage treatment capacity of the various sewage treatment plants in the System are under continuing review for feasibility and cost effectiveness. However, the immediate avenue of approach to both the issues of supply and treatment capacity is conservation: through voluntary changes in user behavior,

through education and the effect of actual use charges based on meters, leak detection and repair and increased use of newly designed low-flow water use fixtures such as toilets. The toilet retrofit program, a source of reimbursement to building owners for installation of low-flow toilets, has cost \$300 million through its completion at the end of Fiscal Year 1997. These measures were undertaken City-wide, but particularly intensively in the various drainage areas noted below as a result of consent decrees relating to issues of sewage treatment capacity.

In 1972 the City began a program of upgrading its existing plants to operate in conformance with the requirements of the Federal Clean Water Act (the "Clean Water Act"), which requires effluent suspended solids and five day biological oxygen demand (BOD<sub>5</sub>) to be 30 milligrams per liter ("mg/l") or less, or that the plant remove 85% or more of these pollutants, whichever provision is more stringent ("Full Secondary Treatment").

In 1996, the 14 plants currently in operation treated about 1,405 mgd of dry-weather sewage, virtually all of the dry-weather sewage generated in the City. Thirteen of the System's 14 plants have been upgraded to provide for Full Secondary Treatment capability.

The following table describes sewage treatment plants currently in service.

#### Water Pollution Control Facilities

<u>Plants in Service</u>	<u>Design Capacity (mgd)</u>	<u>Year of Completion</u>	<u>Completion of Upgrading to Full Secondary Treatment or Reconstruction</u>
Newtown Creek .....	310	1967	2007
Wards Island .....	250	1937	1979
Hunts Point .....	200	1952	1978
Bowery Bay .....	150	1939	1978
Owls Head .....	120	1952	1995
Coney Island .....	100	1935	1994
Jamaica .....	100	1943	1978
26th Ward(1) .....	85	1944	1979
Tallmans Island .....	80	1939	1978
Port Richmond .....	60	1953	1979
Rockaway .....	45	1952	1978
Oakwood Beach .....	40	1956	1979
North River .....	170	1986	1991
Red Hook .....	60	1987	1989
Total System-wide Capacity .....	1,770		

(1) There is a storm-overflow retention facility at Spring Creek, which is connected to the 26th Ward Plant.

All the plants listed above except the Newtown Creek plant, use the step aeration process which meets Federal requirements for full secondary treatment. The design for the upgrade of the Newton Creek plant is currently underway.

DEP has signed an administrative consent order with NYSDEC with regard to plant capacity, odors and air emissions at the North River facility. To date, over \$80 million has been committed to address odor concerns. DEP is undertaking water conservation and surveillance measures designed to reduce the flow of sewage to the North River facility under the administrative consent order which has resulted in a reduction. The average daily flow to the North River Facility was 143 mgd which is below the rated capacity of 170 mgd.

In December 1991, NYSDEC withdrew its approval of the Newtown Creek facility plan because it included technology that had caused operational problems at the North River facility. A new schedule for the planned

upgrade of the Newtown Creek facility, which calls for completion of the upgrade in 2007, has been negotiated with the State. The CIP includes approximately \$1.2 billion to effect this upgrade. The issue of how most effectively to deal with excess flows in the East River portion of the System will be evaluated as a part of the Newtown Creek facility plan.

Water conservation measures including extensive retrofitting of low-flow toilets have resulted in a reduction of water usage in the drainage area of the Newtown Creek water pollution control plant. Consequently, average flow to the sewage treatment plant has been reduced from 343 mgd in 1989 to 266 mgd in 1996, which is below the plant's permitted capacity of 310 mgd.

On February 2, 1989, the City signed an administrative consent order, modified on July 27, 1993, which mandates various water conservation measures to reduce flow to the Wards Island plant. Average daily flows to Wards Island remain near the plant's capacity. Contracts totalling \$101 million were initiated in Fiscal Year 1996 with the next phase scheduled in Fiscal Year 1998 at an estimated cost of \$82.5 million.

The 89 wastewater pump stations are used to convey wastewater over long distances, to drain low-lying areas, and to lift wastewater to treatment plants. Many of the stations were constructed in the 1930s and earlier. The majority of the stations are in need of some reconstructive work. The CIP includes an ongoing program to reconstruct and refurbish stations.

The System has 490 sewer regulators and 552 tide gates which control flow in the collection system. Recent inspections of the regulator system have found it to be structurally adequate, but many portions are in need of mechanical reconstruction. A detailed evaluation of the regulator and tide gate system has been completed and funds have been provided in the CIP for mechanical refurbishment of these facilities. The useful life of some of the mechanical components of the Wastewater Treatment System is less than 20 years. To maintain desired treatment levels, corrective and preventive maintenance programs are carried out and periodic major refurbishment of such mechanical components is provided for in the CIP.

During periods of heavy rainfall a combination of stormwater and sewage bypasses treatment and is released into the City's waterways via combined overflows. The combined sewer overflow abatement program provides for studies, design and construction of facilities to address this issue. The CIP includes approximately \$1.4 billion for this program.

According to the most recent Harbor Survey issued by DEP, water quality in the harbor and surrounding rivers continues to improve. The Harbor Survey is an ongoing monitoring effort of the City's waterways that has been in existence since 1909. The Survey monitors 17 water quality parameters at the surface and bottom waters of 53 sampling stations in New York Harbor. Coliform bacterial counts, which are indicators of sewage pollution, have continued to decline. Since 1993, compliance with New York State total and fecal coliform standards continues to be estimated at the highest levels recorded by this program. Another key indicator of the quality of the City's surrounding waters is the measure of dissolved oxygen (DO) in the water. DO is one of the most universal indicators of overall water quality in aquatic systems. An assessment of the adequacy of the amount of DO present is performed by comparing actual concentrations to New York State standards. These standards vary between 3 and 5 milligrams per liter (mg/l), depending on the designated best use of the waterway. DO concentrations in most areas of the Harbor have been notably higher in the 1990s than in the late 1980s. Since 1992, DO levels at many sites continue to be the highest ever recorded by this program, which has monitored some stations since 1909. These improvements are primarily in response to: continued water pollution control plant construction and upgrades throughout the harbor; the abatement of illegal discharges; improved surveillance and sewer maintenance; and increased capture of wet weather flows. The New York City Department of Health's "wet weather advisory" (no swimming within forty-eight hours of a heavy rain) was lifted at seven of ten City public beaches in June 1993. At the remaining three city beaches, the advisory was reduced from a 48-hour ban on swimming after heavy rains to a 12-hour advisory, and water quality at the City's beaches continues to improve.

As part of a cooperative effort to further improve water quality in the City's waterways, USEPA, along with the States of New York and New Jersey, recently released a Comprehensive Conservation Management Plan for the New York-New Jersey Harbor and the waters of the New York Bight. This Plan, developed under the aegis of the federal Harbor Estuary Program, builds on many of the City's ongoing programs such as sewage treatment plant upgrades, controlling and capturing wet weather flows and reducing floatable debris. Under the Plan, the City will continue to promote improved water quality through, among other things, its efforts to eliminate combined sewer overflows, encourage water conservation, enhance surveillance of industrial discharges, and install sewers in areas of the City where they are not yet available. All of the capital commitments to be undertaken by the City pursuant to the Plan are already included in the CIP.

The Long Island Sound Study ("LISS") is a joint federal-state-local (the states being New York and Connecticut) program to identify the Sound's major environmental problems and develop a plan to manage those problems. USEPA is the lead federal agency involved in LISS. Hypoxia, or low levels of dissolved oxygen, has emerged as the issue of greatest concern in Long Island Sound. Hypoxia is the result of a chemical chain reaction that begins with high levels of nutrients, largely nitrogen. In addition to natural sources, other nutrient sources include effluent from sewage treatment plants, stormwater run-off carrying lawn and agricultural fertilizer, organic materials, and air-deposited nitrate substances. The first phase of the study has been completed and a Comprehensive Conservation and Management Plan has been adopted by the participants to reverse the adverse impact associated with hypoxia in Long Island Sound. The City has entered into agreements in the context of SPDES permit renewal applications to undertake certain measures to control nitrogen levels. The recently initiated Biological Nutrient Removal program will retrofit all fourteen plants to reduce the amount of nitrogen discharged into New York Harbor, Jamaica Bay and Long Island Sound. The CIP as revised by the Current Capital Plan includes approximately \$90 million for a biological nutrient removal program to control nitrogen levels.

#### *Sludge Disposal*

Pursuant to the Consent Decree under MPRSA as amended by the Ban Act, DEP ceased the ocean disposal of sludge in June 1992.

The Consent Decree required the implementation of a long-term program for land-based disposal of sludge. The long-term program that was provided for under the Consent Decree would have required the construction of facilities capable of processing the City's sludge by June 30, 1998.

As part of the interim measures provided for under the Consent Decree, DEP is operating facilities at eight of the sewage treatment plants to dewater sludge and reduce its volume. These facilities have the capacity to dewater all of the sludge generated by the System. Approximately 86% of the sludge produced is being beneficially used as of Fiscal Year 1996. DEP has contracted with various private firms for the beneficial use, through land application or disposal, of its dewatered sludge. In addition, in August 1993 one private firm began operation of a thermal drying facility located in the Bronx that processes approximately 220 dry tons per day. The City's financial plan includes \$95 million in Fiscal Year 1998 and \$71 million in Fiscal Year 1999 for contracts with private vendors to manage the dewatered sludge.

As a result of the success of the interim measures, DEP has negotiated a modification to the Consent Decree which provides for a long-term program similar to the current interim measures for sludge disposal. The U.S. District Court for the Eastern District of New York has approved the modification and DEP is in the process of complying with the public notification procedures.

Ocean disposal fees and penalties imposed by the Ban Act and the Consent Decree were paid through September 14, 1993. The Ban Act and the Consent Decree provide that 85% of the fees and penalties paid shall be deposited into a trust account and shall be available to reimburse the City for costs incurred for developing alternative sludge disposal facilities. As of December 31, 1996, the value of the trust account was approximately \$90.3 million. A portion of the balance of the fees and penalties was paid to USEPA with the remainder divided equally between the New York State Water Pollution Control Revolving Fund and the New York State Clean



Oceans Fund. Amounts paid to the Clean Oceans Fund are also available to reimburse the City for the costs of developing alternative sludge management programs. For projected use of amounts in the trust account, see "FINANCIAL OPERATIONS—Projected Operating and Maintenance Expenses—Credits Against Operation and Maintenance Expenses".

### *Staffing Evaluation*

Staffing for maintenance has been reduced over the last three years. However, Metcalf & Eddy has concluded that current staffing levels in combination with capital programs appear adequate for operation and maintenance of existing water and wastewater facilities. See "APPENDIX A—LETTER OF METCALF & EDDY, CONSULTING ENGINEERS".

## **Governmental Regulation**

### *Wastewater Regulation*

Under the Federal Water Pollution Control Act, as amended by the Clean Water Act of 1977 and by the Water Quality Act of 1987 (the "Clean Water Act"), USEPA administers an extensive program of Federal capital construction grants (the "Construction Grants Program") and oversees compliance with Federal environmental laws, regulations and guidelines promulgated by it concerning (i) sewer and sewage treatment plant construction, operation, maintenance, upgrading and rehabilitation, (ii) introduction of toxins and other pollutants into sewer and sewage treatment facilities, and (iii) pollutant discharges into public waters. Included in that regulatory framework is the National Pollutant Discharge Elimination System ("NPDES") Permit Program and the issuance of sewage treatment plant operating permits. As authorized by the Clean Water Act, administration of the permit program has been delegated to the State.

The Water Quality Act of 1987 phased out the Construction Grants Program and provided for the implementation of a water pollution control revolving loan program. Such act requires, as a condition for receipt of federal financial assistance, that each state establish a revolving fund administered by the state or an instrumentality of the state. The purpose of a state revolving fund is to provide a source for loans and other types of financial assistance (other than direct grants) to local entities for the construction of publicly owned wastewater treatment facilities. Initial funding for a revolving fund program is provided from federal capitalization grants and state matching funds.

The State has created State revolving funds and has designated EFC to be the administrator of such funds. EFC applies federal capitalization grants and State matching funds or other available amounts in the State revolving funds to provide subsidized capital financing to municipalities for eligible sewage treatment projects and will apply such amounts in the future for eligible water supply projects.

In order to comply with the mandates of the Clean Water Act, the City upgraded existing plants and constructed certain new facilities. In 1972, the City began a program of upgrading its existing plants to operate in conformance with the requirements of the Clean Water Act; that is, 30 milligrams per liter ("mg/l") or less of suspended solids and BOD<sub>5</sub> in the effluent or at least 85% removal, whichever is more stringent ("Full Secondary Treatment"). Thirteen of the System's 14 sewage treatment plants have already been upgraded at a construction cost of approximately \$2.5 billion. The Newtown Creek plant will also be upgraded in order to meet Federal requirements. See "THE SYSTEM—The Sewer System—Sewage Treatment Facilities".

The Clean Water Act also directs USEPA to address the problem of discharges of toxins and other pollutants into publicly-owned treatment works. USEPA has promulgated effluent limits for toxic and other substances that must be met by specific industries ("Categorical Standards") and has directed that publicly owned treatment works establish and enforce industrial pretreatment programs. The System has undertaken such a program and met the required milestones. DEP has modified its Sewer Use Regulations to incorporate the Categorical Standards and has assigned personnel to monitor and enforce compliance with the Sewer Use Regulations.

Under Federal court order, the Ban Act, MPRSA and USEPA regulations promulgated thereunder, the System was also required to have a permit for dumping into the Atlantic Ocean sludge generated by its sewage treatment plants and to cease ocean disposal by June 30, 1992, which milestone was met. These regulations also include requirements for the long-term disposal of sludge. See "THE SYSTEM—The Sewer System—Sludge Disposal".

*State.* Under authority delegated by USEPA the State established SPDES and has assumed jurisdiction over point source discharges and wastewater treatment plant operating permits. The State powers are enforced by NYSDEC, which also administers the Construction Grants Program. NYSDEC, therefore, has regulatory power with respect to the upgrading, construction and operation of the sewage treatment plants pursuant to some 14 SPDES permits, one for each plant the City operates. In addition, NYSDEC monitors compliance by the System not only with the conditions of the Construction Grants Program, but also the System's adherence to the terms of the State construction and operations reimbursement grants under the State's Pure Waters Bond Act of 1965 and Environmental Quality Bond Act of 1972.

As part of its municipal compliance program, the State took action against the City for those sewage treatment plants that were unable to attain the secondary treatment requirements of the Clean Water Act by July 1, 1988. This court action resulted in the City signing consent decrees (the "State Consent Decrees") for the Owls Head, Coney Island, Newtown Creek and Oakwood Beach plants, all of which include compliance schedules, which, with the exception of Newtown Creek, have been met. State referees have been assigned to monitor the City's compliance. A modification to the State Consent Decree requiring the upgrading of the Newtown Creek plant has been negotiated with the State. The new date for completion is 2007 and the City is in compliance with the schedule.

The System is also required to develop programs to reduce pollution from combined sewer overflows and to eliminate excess inflow into the Sewer System from infiltration of ground and storm water. In June 1992, DEP entered into a consent order with the State establishing various deadlines through 2006 for the construction of nine combined sewer overflow projects, which may include storage tanks. The CIP includes approximately \$1.4 billion for such combined sewer overflow projects. Certain of the consent order interim deadlines have not been met. Consistent with USEPA guidelines, the City is exploring alternative approaches to combined sewer overflow problems that focus on cost-effective means of protecting water quality.

On May 19, 1989, in a proceeding commenced by the ISC and several environmental groups against NYSDEC, the New York State Supreme Court, Queens County, ruled that NYSDEC was required to conduct a hearing prior to the renewal of operating permits for the City's fourteen sewage treatment plants. NYSDEC is currently conducting an administrative proceeding which has resulted in and could continue to result in modifications of the permits previously issued by NYSDEC. Some of the terms of the permits have been settled, but certain issues remain. The City has submitted an application for renewal permits and has asked for certain amendments.

NYSDEC notified the City of alleged violations of the SPDES permits for the City's wastewater treatment plants as a result of corrective and preventive maintenance at a level below that which NYSDEC believes is required by the permits. A consultant was hired to gather relevant data to enable DEP to determine the appropriate level of corrective and preventive maintenance for its wastewater treatment plants. This study will include a review of the practices of other utilities in connection with corrective and preventive maintenance. Based on this study, DEP may attempt to modify the SPDES permits or may change its practices and priorities relating to plant maintenance.

Over the past several years, NYSDEC and DEP have resolved various alleged permit violations at the City's 14 sewage treatment plants by entering into "omnibus" consent orders. These administrative orders typically detail the alleged violations for a specified period of time and set forth remedial actions related to such violations. NYSDEC and DEP are in the process of negotiating the most recent omnibus consent order, covering various matters including alleged effluent and bypass violations at a number of plants. NYSDEC recently advised DEP

that it intended to add a number of additional requirements to the proposed order which do not appear to be related to these alleged violations. DEP has requested and NYSDEC has agreed to further discussions about the scope of the proposed order.

*Interstate.* In the late 1920's the State and the states of Connecticut and New Jersey recognized the need for interstate cooperation and regulatory overview to abate and control pollution in their tidal and coastal waters. The ISC was formed for those purposes by a tri-state compact approved by Congress in 1935. The ISC was given investigative and regulatory powers which it exercises with respect to floating and settleable solids, oil and grease contamination, color and turbidity, dissolved oxygen and BOD<sub>5</sub>, and various other standards. In large measure, the jurisdiction of ISC has been preempted by the more comprehensive Federal and State legislation and regulations currently in force. Nonetheless, the ISC continues to exercise an investigative and regulatory role which reinforces and supplements those of the Federal, State and municipal governments.

*Municipal.* Rates, fees and charges for sewer service are the responsibility of the Board. Connections to the System's sewers are also regulated by DEP under the Sewer Use Regulations and by DOB under the Building and Building Construction Codes. Also contained in the Sewer Use Regulations are the industrial pretreatment standards mandated by USEPA under the Clean Water Act.

## **ECONOMIC, SOCIAL AND DEMOGRAPHIC STATISTICS**

This section presents information regarding certain of the major economic and social factors in the City. All information is presented on a calendar year basis unless otherwise indicated. The data set forth are the latest available. Sources of information are indicated in the text or immediately following the charts and tables. Although the Authority considers the sources to be reliable, the Authority has made no independent verification of the information presented herein and does not warrant its accuracy.

### **New York City Economy**

The City has a highly diversified economic base, with a substantial volume of business activity in the service, wholesale and retail trade and manufacturing industries, and is the location of many major securities, banking, law, accounting and advertising firms.

The City is a major seaport and focal point for international business. Many of the major corporations headquartered in the City are multinational in scope and have extensive foreign operations. Numerous foreign-owned companies in the United States are also headquartered in the City. These firms, which have increased substantially in number over the past decade, are found in all sectors of the City's economy, but are concentrated in trade, manufacturing, sales offices, tourism and finance. The City is the location of the headquarters of the United Nations, and several affiliated organizations maintain their principal offices in the City. A large diplomatic community exists in the City to staff the 157 missions to the United Nations and the 88 foreign consulates.

Economic activity in the City has experienced periods of growth and recession and can be expected to experience periods of growth and recession in the future. From 1969 to 1977, the City experienced declines in employment, but from 1978 to 1987 the City experienced strong growth in jobs, especially in the City's finance, insurance and real estate ("FIRE") sector due in large part to lower inflation, lower interest rates and a strong securities market. Beginning in 1988, employment growth in the City slowed, and in 1990 the City experienced job losses, although the U.S. economy expanded during that period. From 1991 to 1993, employment levels in the City continued to decline. In recent years, the City has experienced increases in employment. Real per capita personal income (i.e., per capita personal income adjusted for the effects of inflation and the differential in living costs) has generally experienced fewer fluctuations than employment in the City. Although the City experienced periodic declines in real per capita income between 1969 and 1981, real per capita personal income in the City has generally increased from the mid-1980s until the present. Overall, the City's economic improvement accelerated significantly in Fiscal Year 1997. Much of the increase can be traced to the performance of the securities industry, but the City's economy also produced gains in the retail trade sector, the hotel and tourism industry, and business services, with private sector employment higher than previously forecast.

## Population

The City has been the most populous city in the United States since 1810. The City's population is almost as large as the combined population of Los Angeles, Chicago and Houston, the three next most populous cities in the nation.

The City's population reached its peak of approximately 7.9 million in 1970 before declining by 10.4% between 1970 and 1980. From 1980 to 1988, the population of the City steadily increased before dropping slightly from 1989 to 1991. The City's population has increased to approximately 7.4 million in 1996 from approximately 7.3 million in 1991. The following table provides information concerning the City's population.

**Population of New York City(1)**

Year	Total Population
1980	7,071,639
1984	7,234,514
1985	7,274,054
1986	7,319,246
1987	7,342,476
1988	7,353,719
1989	7,344,175
1990	7,322,564
1991	7,308,237
1992	7,315,213
1993	7,347,396
1994	7,363,500
1995	7,373,057
1996	7,380,906

(1) 1984-1989 and 1991-1996 figures are based on midyear population estimates of the U.S. Bureau of the Census as of March 1997.

Note: Figures do not include an undetermined number of undocumented aliens.

Source: U.S. Department of Commerce, Bureau of the Census.

## Employment Trends

The City is a leading center for the banking and securities industry, life insurance, communications, publishing, fashion design and retail fields. From 1994 through 1997, the City has experienced significant private sector job growth with the addition of more than 140,000 new private sector jobs. This expansion over the last three years matches the largest three year job growth rate that the City has experienced since the 1950s, and contrasts with the approximately 9% loss in the City's employment base during 1989-1992. The table below shows the distribution of employment from 1988 to 1996.

**New York City Employment Distribution**

	Average Annual Employment (in thousands)								
	1988	1989	1990	1991	1992	1993	1994	1995	1996
<b>Private Sector:</b>									
Non-Manufacturing:									
Services	1,123	1,147	1,149	1,097	1,093	1,116	1,148	1,184	1,229
Wholesale and Retail Trade	634	630	608	565	546	538	544	555	562
Finance, Insurance and Real Estate	542	531	520	494	473	472	480	473	472
Transportation and Public Utilities	220	218	229	218	205	203	201	203	205
Construction	120	121	115	100	87	86	89	90	91
Total Non-Manufacturing	2,639	2,647	2,621	2,474	2,404	2,415	2,462	2,505	2,559
Manufacturing:									
Durable	98	94	88	77	72	71	69	68	65
Non-Durable	272	265	250	231	220	218	211	206	199
Total Manufacturing	370	359	338	308	292	289	280	274	264
<b>Total Private Sector</b>	3,010	3,006	2,958	2,782	2,697	2,703	2,744	2,779	2,823
<b>Government</b>	596	602	608	593	584	580	567	544	534
<b>Total</b>	3,606	3,608	3,566	3,375	3,281	3,283	3,311	3,323	3,357

Note: Totals may not add due to rounding.

Source: U.S. Department of Labor, BLS.

## Sectoral Distribution of Employment and Earnings

In 1996, the City's services employment sector hit an all-time peak, providing more than 1.2 million jobs and accounting for 36.6% of total employment. Figures on the sectoral distribution of employment in the City reflect a significant shift to non-manufacturing employment, particularly to the areas of services and FIRE, and a shrinking manufacturing base in the City relative to the nation.

The structural shift from manufacturing to the services and FIRE sectors affects the level of earnings per employee because employee compensation in finance and related business and professional services is considerably higher than in manufacturing. Moreover, per employee earnings in the FIRE sector are significantly higher in the City than in the nation. From 1977 to 1994 the employment share for FIRE increased from 13.0% to 14.5% in the City while the FIRE sector earnings share for the same period rose from 16% to 25% in the City. This shift in employment and earnings distribution toward the FIRE sector was more pronounced in the City than in the nation overall as indicated in the table below. Due to this shift in earnings distribution, sudden or large shocks in the financial markets have a disproportionately adverse effect on the City relative to the nation.

The City's and the nation's employment and earnings by industry are set forth in the following table.

**Sectoral Distribution of Employment and Earnings(1)**

Sector	Employment				Earnings(2)			
	1977		1994		1977		1994	
	NYC	U.S.	NYC	U.S.	NYC	U.S.	NYC	U.S.
<b>Private Sector:</b>								
Non-Manufacturing:								
Services .....	24.6%	18.6%	34.7%	27.7%	24.9%	17.9%	35.0%	27.9%
Wholesale and Retail Trade .....	19.5	22.4	16.4	23.4	16.0	17.2	11.0	16.0
Finance, Insurance and Real Estate .....	13.0	5.4	14.5	6.0	16.0	5.8	24.9	7.5
Transportation and Public Utilities .....	8.1	5.7	6.1	5.2	10.9	7.7	6.0	6.8
Contract Construction .....	2.0	4.7	2.7	4.4	2.4	6.5	2.7	5.4
Mining .....	0.0	1.0	0.0	0.5	0.4	1.8	0.0	0.9
Total Non-Manufacturing .....	67.2	57.8	74.4	67.2	70.8	57.2	79.6	64.6
Manufacturing:								
Durable .....	5.1	14.0	2.1	9.2	4.3	16.4	1.8	11.3
Non-Durable .....	11.8	9.8	6.4	6.9	10.5	9.5	5.7	7.3
Total Manufacturing .....	16.9	23.9	8.5	16.1	14.8	25.9	7.5	18.5
<b>Total Private Sector</b> .....	84.0	81.7	82.9	83.3	85.6	83.1	87.1	83.2
<b>Government(3)</b> .....	15.9	18.3	17.1	16.7	14.4	16.9	12.7	16.2

Note: Totals may not add due to rounding.

- (1) The sectoral distributions are obtained by dividing each industry's employment or earnings by total non-agricultural employment or earnings.
- (2) Includes the sum of wage and salary disbursements, other labor income, and proprietors' income. The latest information available for the City is 1994 data.
- (3) Excludes military establishments.

Sources: The two primary sources of employment and earnings information are U.S. Department of Labor, Bureau of Labor Statistics, and U.S. Department of Commerce, Bureau of Economic Analysis.

## Personal Income

Per capita personal income for City residents, unadjusted for the effects of inflation and the differential in living costs, has steadily increased from 1985 to 1995 (the most recent year for which City personal income data

are available) and is higher than the average for the United States. From 1985 to 1995, per capita personal income in the City averaged 5.7% growth compared to 4.9% for the nation. The following table sets forth recent information regarding personal income in the City.

### Personal Income in New York City(1)

Year	Total NYC Personal Income	Per Capita Personal Income	Per Capita Personal Income	NYC as a Percent of
	(\$ billions)	NYC	U.S.	U.S.
1985.....	\$124.2	\$17,075	\$14,406	118.5%
1986.....	133.3	18,212	15,140	120.3
1987.....	142.7	19,434	16,944	114.7
1988.....	156.5	21,277	17,017	125.0
1989.....	167.8	22,842	18,127	126.0
1990.....	179.9	24,570	19,142	128.4
1991.....	184.5	25,242	19,638	128.5
1992.....	197.4	26,985	20,582	131.1
1993.....	199.1	27,098	21,223	127.7
1994.....	207.2	28,133	22,044	127.6
1995.....	219.3	29,743	23,196	128.2

(1) In current dollars. Personal Income is based on the place of residence and is measured from income which includes wages and salaries, other labor income, proprietors' income, personal dividend income, personal interest income, rental income of persons and transfer payments.

Sources: U.S. Department of Commerce, Bureau of Economic Analysis and the Bureau of the Census.

### Housing

In 1993, the most recent year for which data are available, the housing stock in the City consisted of 2,985,527 housing units, excluding certain special types of units primarily in institutions such as hospitals and universities. The 1993 housing inventory represented an increase of 4,765 units, or .2%, since 1991. The 1991 housing inventory of 2,980,762 housing units represented an increase of 140,505 units, or 5.0% since 1987. Although the total population of the City was essentially unchanged at 7.1 million between 1991 and 1993 and grew by 1.7% between 1987 and 1991, housing in the City remains in short supply. The following table presents the housing inventory in the City.

### Housing Inventory In New York City (housing units in thousands)

<u>Ownership/Occupancy Status</u>	<u>1981</u>	<u>1984</u>	<u>1987</u>	<u>1991</u>	<u>1993</u>
Total Housing Units.....	2,792	2,803	2,840	2,980	2,986
Owner Units.....	755	807	837	858	827
Owner-Occupied.....	746	795	817	829	806
Vacant for Sale.....	9	12	19	10	21
Rental Units.....	1,976	1,940	1,932	2,027	2,047
Renter-Occupied.....	1,934	1,901	1,884	1,951	1,977
Vacant for Rent.....	42	40	47	76	70
Vacant Not Available for Sale or Rent(1).....	62	56	72	94	112

(1) Vacant units that are dilapidated, intended for seasonal use, held for occasional use, held for maintenance purposes or other reasons.  
Note: Totals may not add due to rounding.

Sources: U.S. Bureau of the Census, 1981, 1984, 1987, 1991 and 1993 New York City Housing and Vacancy Surveys, as quoted in Blackburn, Anthony J., "Housing New York City", The City of New York Department of Housing Preservation and Development (New York, June 1995)

The 1993 Housing and Vacancy Report indicates that rental housing units predominate in the City. Of all occupied housing units in 1993, 29% were conventional home-ownership units, cooperatives or condominiums and 71% were rental units. Most of the growth in owner-occupied units has come from the conversion of existing rental units to cooperatives rather than through the new construction of housing for sale to occupants in the City. The vacancy rate for rental housing was 3.44% in 1993, and median rent consumed 30.8% of the gross income of tenants. The housing condition of occupied rental units has improved greatly since 1984, with a decrease in the proportion of rental units in dilapidated or deficient condition.

## LITIGATION

There is no action, suit, proceeding or investigation, at law or in equity, before or by any court, public board or body pending or, to the best knowledge of the Authority, threatened against or affecting the Authority to restrain or enjoin the issuance, sale or delivery of the Fiscal 1998 B Bonds, or in any way contesting or affecting the validity of the Fiscal 1998 B Bonds, or any proceedings of the Authority, the Board or the City taken with respect to the issuance or sale of the Fiscal 1998 B Bonds, or with respect to the Resolution or the pledge or application of any money or security provided for the payment of the Fiscal 1998 B Bonds, or the existence or powers of the Authority or the Board.

Pursuant to the Lease and the Agreement, the City has agreed, subject to certain conditions, to indemnify the Authority and the Board against any and all liability in connection with any act done or omitted in the exercise of their powers which is taken or omitted in good faith in pursuance of their purposes under the Act. The City, however, is entitled to reimbursement by the Board for the amount of any judgment or settlement paid by the City (and not otherwise reimbursed from any other source) arising out of a tort or contract claim to the extent that the City's liability therefor is related to the operation, maintenance and improvement of the System provided, however, that the Board is not required to reimburse the City in any one year for tort claims in excess of 5% of the Revenues of the Board for such Fiscal Year.

There are numerous claims seeking damages and injunctive and other relief against the City related to the System. Except as noted below, these claims represent routine litigation incidental to the performance of the City's governmental functions in connection with the operation, maintenance and improvement of the System. The City has paid an average of approximately \$2.4 million per year from Fiscal Years 1991 through 1996 in satisfaction of tort claims relating to the operation of the System. The majority of these claims allege property damage caused by water main breaks and sewer overflows. Contract claims on water supply, sewer and water pollution control projects arise in varying amounts based on alleged change orders and related matters. Numerous lawsuits relating to construction contract claims are currently pending. While most seek under \$10 million in damages, one action seeks damages in excess of \$11 million, two seek damages of \$12 million, a fourth seeks damages in excess of \$26 million, a fifth seeks damages in excess of \$27 million and a sixth seeks damages of \$50 million. While the probable outcome of these actions cannot be determined at this time, contract claims are expected to be funded through the CIP, which may be revised from time to time to accommodate such claims as well as other changes therein.

The following paragraphs describe certain legal proceedings and claims involving the System, other than routine litigation incidental to construction, the collection of rates, fees and charges and certain other litigation arising out of alleged constitutional violations, torts, breaches of contract and other violations of law and condemnation proceedings. As of June 30, 1996, the City estimated that its potential future liability for claims involving the System was approximately \$44 million. However, the ultimate outcome of the proceedings and claims described below is not currently predictable, and unfavorable determinations in certain of them could result in substantial judgments.

1. Approximately 50 actions, including a purported class action, were commenced against the City alleging damages arising out of an August 10, 1983 water main break and electrical blackout. On December 18, 1990, the New York State Supreme Court, New York County, dismissed all claims which sought damages for purely economic loss unaccompanied by any claim for direct physical damage.

2. Forty actions have been commenced against the City seeking damages in excess of \$364 million for personal injuries and property damage in connection with an explosion of a Con Edison steam pipe which occurred in Gramercy Park on August 19, 1989.

3. In November 1994, the City received a series of complaints filed in New York State Supreme Court for Putnam County, from approximately 45 property owners in the upstate watershed, seeking damages in the amount of approximately \$10.5 billion in the aggregate for alleged injury to property caused by the City's upstate watershed regulatory program and also asserting claims for the unconstitutional taking of property without just compensation. The City has also received approximately 80 additional claims from property owners not parties to the litigation, seeking similar relief. On February 20, 1995, the plaintiffs withdrew their federal constitutional claims. In response to a motion to dismiss brought by the City, on June 24, 1997, the Court ruled that plaintiffs could assert claims against the City for any diminution in the value of their property caused by a chilling effect on the real estate market from the City's watershed regulations. The Court further ruled that plaintiffs with development plans not approved by the City under the watershed regulations could assert claims for additional damages beyond any general effect of the City's watershed regulations on the real estate market. The City believes that the Court's decision is in error and has appealed to the Appellate Division, State Supreme Court, Second Department. If the plaintiffs were to prevail, the City could face claims from other property owners in the upstate watershed and could face potentially significant financial liability in satisfaction of such claims.

4. The City is a party to a 1992 stipulation with NYSDOH, which sets out a timetable for the design and construction of a full-scale water treatment plant for the Croton supply system. The City is engaged in discussions with NYSDOH and USEPA, seeking a modification of the timetable to allow for additional studies of plant design, alternate sites, and Croton System management options, as well as an extended period for design and construction. USEPA referred this matter to the United States Department of Justice which initiated an action against the City seeking a court-imposed timetable and the imposition of penalties on April 24, 1997.

The United States filed suit against the City and DEP in the U.S. District Court, Eastern District of New York pursuant to the SDWA and the SWTR. The complaint alleges that the City violated the SDWA and the SWTR by not providing filtration for the Croton System by June 29, 1993, and that the City has been in violation of the SDWA and the SWTR since that date. The complaint requests that the Court order the City to design, construct and operate a Croton filtration plant on an expeditious schedule, and to comply with filtration, disinfection, monitoring and reporting requirements. In addition, the United States seeks penalties of up to \$25,000 for each day of violation of the SWTR or the SDWA occurring prior to January 31, 1997, and up to \$27,500 for each day of violation occurring on or after January 31, 1997 (along with awarding the United States its costs in the action).

The State of New York, with the consent of the City and the United States, intervened as a plaintiff in the action brought by the United States. The State alleges that the City has violated the State Sanitary Code and the terms of the 1992 stipulation. The State is seeking an order directing the City to design, construct and operate a Croton filtration plant on an expeditious schedule. The State is not seeking any penalties.

The City's position is that penalties are not warranted and should not be assessed by the Court in this action. Based on the City's past experience with enforcement actions of this type, the City expects that, if penalties are paid in connection with this matter, the amount thereof will be substantially less than the amount which the complaint in this action seeks. The City intends to defend this action vigorously, while at the same time continuing its discussions with USEPA and NYSDOH in an effort to reach a negotiated agreement.

#### **APPROVAL OF LEGAL PROCEEDINGS**

The issuance of the Fiscal 1998 B Bonds is subject to the approval of legality by Nixon, Hargrave, Devans & Doyle LLP, New York, New York, Bond Counsel. Certain legal matters will be passed upon for the City and the Board by the City's Corporation Counsel. Certain legal matters will be passed upon for the Underwriters by Willkie Farr & Gallagher, New York, New York.



## FINANCIAL ADVISOR

O'Brien Partners Inc. and Samuel A. Ramirez & Co. have served as financial advisor to the Authority with respect to the sale of the Fiscal 1998 B Bonds.

## FURTHER INFORMATION

The references herein to and summaries of Federal, State and local laws, including but not limited to the Code, the Constitution and laws of the State, the Act, the 1905 Act, the Clean Water Act, the SDWA, the Ban Act, the MPRSA, and documents, agreements and court decisions, including but not limited to the Lease, the Agreement, the Resolution and the Second Resolution are summaries of certain provisions thereof. Such summaries do not purport to be complete and are qualified in their entirety by reference to such acts, laws, documents, agreements or decisions. Copies of the Lease, the Agreement, the Resolution and the Second Resolution are available for inspection during normal business hours at the office of the Authority.

Any statements in this Official Statement involving matters of opinion, whether or not expressly so stated, are intended as such and not as representations of fact. Neither this Official Statement nor any statement which may have been made orally or in writing shall be construed as a contract or as a part of a contract with the original purchasers or any holders of the Fiscal 1998 B Bonds.

## CONTINUING DISCLOSURE UNDER SEC RULE 15c2-12

To the extent that Rule 15c2-12 (the "Rule") of the Securities and Exchange Commission ("SEC") under the Securities and Exchange Act of 1934, as amended (the "1934 Act"), requires the Underwriters to determine, as a condition to purchasing the Fiscal 1998 B Bonds, that the Authority will covenant to the effect of the provisions here summarized (the "Undertaking"), and the Rule as so applied is authorized by a Federal law that as so construed is within the powers of Congress, the Authority agrees with the record and beneficial owners from time to time of the Fiscal 1998 B Bonds (the "Bondholders") that it will:

(1) within 240 days after the end of the 1998 Fiscal Year and each subsequent Fiscal Year, deliver to each nationally recognized municipal securities information repository and to any New York State information depository, core financial information and operating data for the prior Fiscal Year, including (i) the System's audited financial statements, prepared in accordance with generally accepted accounting principles in effect from time to time, and (ii) material historical financial and operating data concerning the System and the Revenues of the System generally of the type included in this Official Statement under the captions "CAPITAL IMPROVEMENT AND FINANCING PROGRAM", "FINANCIAL OPERATIONS", "RATES AND BILLINGS", and "THE SYSTEM"; and

(2) provide in a timely manner, to each nationally recognized municipal securities information repository or to the Municipal Securities Rulemaking Board, and to any New York State information depository, notice of any of the following events with respect to the Fiscal 1998 B Bonds, if material:

- (a) principal and interest payment delinquencies;
- (b) non-payment related defaults;
- (c) in the case of credit enhancement that is provided in connection with the issuance of the Fiscal 1998 B Bonds, unscheduled draws on such credit enhancement reflecting financial difficulties and substitution of credit providers, or their failure to perform;
- (d) unscheduled draws on debt service reserves reflecting financial difficulties;
- (e) adverse opinions or events affecting the exclusion from gross income for Federal income tax purposes of interest on the Fiscal 1998 B Bonds;

- (f) modifications to rights of security holders;
- (g) bond calls;
- (h) defeasances;
- (i) release, substitution, or sale of property securing repayment of the securities;
- (j) rating changes; and
- (k) failure by the Authority to comply with clause (l) above.

The Authority expects to provide the information described in clause (l) above by delivering its first bond official statement that includes its financial statements for the preceding fiscal year.

Currently, there is no New York State information depository and the nationally recognized municipal securities information repositories are: Bloomberg Municipal Repository, P.O. Box 840, Princeton, New Jersey 08542-0840; Kenny Information Systems, Inc., 65 Broadway, 16th Floor, New York, New York 10006; Moody's NRMSIR Public Finance Information Center, 99 Church Street, New York, New York 10007; R.R. Donnelley Financial, Municipal Security Disclosure Archive, 559 Main Street, Hudson, Massachusetts 01749; Thompson NRMSIR, 395 Hudson Street, Third Floor, New York, New York 10014; and DPC Data Inc., One Executive Drive, Fort Lee, New Jersey 07024.

No Bondholder may institute any suit, action or proceeding at law or in equity ("Proceeding") for the enforcement of the Undertaking or for any remedy for breach thereof, unless such Bondholder has filed with the Authority evidence of ownership and a written notice of and request to cure such breach, and the Authority has not complied within a reasonable time; provided, however, that any Proceeding challenging the adequacy of any information provided pursuant to paragraphs (1) and (2) above may be brought only by the Trustee or the holders of a majority in aggregate principal amount of the Bonds affected thereby which at the time are Outstanding. All Proceedings may be instituted only as specified herein, in the Federal or State courts located in the Borough of Manhattan, State and City of New York, and for the equal benefit of all holders of the Outstanding Bonds benefited by the same or a substantially similar covenant. No remedy may be sought or granted other than specific performance of the covenant at issue.

Any amendment to the Undertaking will take effect only if:

(a) the amendment is made in connection with a change in circumstances that arises from a change in legal requirements, change in law, or change in the identity, nature, or status of the Authority or the Board, or type of business conducted; the Undertaking, as amended, would have complied with the requirements of the Rule at the time of sale of the Bonds to the Underwriters, after taking into account any amendments or interpretations of the Rule, as well as any change in circumstances; and the amendment does not materially impair the interests of Bondholders, as determined by parties unaffiliated with the Authority (such as, but without limitation, the Authority's financial advisor or bond counsel) and the annual financial information containing (if applicable) the amended operating data or financial information will explain, in narrative form, the reasons for the amendment and the "impact" (as that word is used in the letter from the staff of the SEC to the National Association of Bond Lawyers dated June 23, 1995) of the change in the type of operating data or financial information being provided; or

(b) all or any part of the Rule, as interpreted by the staff of the SEC at the date of the Undertaking, ceases to be in effect for any reason, and the Authority elects that the Undertaking will be deemed terminated or amended (as the case may be) accordingly.

For purposes of the Undertaking, a beneficial owner of a security includes any person who, directly or indirectly, through any contract, arrangement, understanding, relationship, or otherwise has or shares investment power which includes the power to dispose, or to direct the disposition of, such security, subject to certain exceptions, as set forth in the Undertaking. Any assertion of beneficial ownership must be filed, with full documentary support, as part of the written request to the Authority described above.

## **INVESTMENTS**

The Authority invests monies available in its Debt Service Reserve Fund, Debt Service Fund, Construction Fund, and the Revenue Fund. Investments are made pursuant to restrictions contained in the Resolutions and the Authority's Investment Guidelines as adopted and modified from time to time by the Authority's Board of Directors. The investments of the Authority are audited annually by its independent auditors which, in addition, are required to provide to the Authority's Board of Directors an Investment Compliance letter confirming compliance with both the Authority's Investment Guidelines and with Investment Guidelines of Public Authorities of the State Comptroller of New York. Semi-annual valuation of the Debt Service Reserve Fund and annual valuation of all other funds is required by the Resolution at the lower of cost or market value until the Twenty-second Supplemental Resolution and the related amendments to the Agreement take effect. After the Twenty-second Supplemental Resolution and the related amendments of the Agreement take effect, valuation of the Debt Service Reserve Fund and all other funds will be at the lower of amortized cost or market value. For other changes in investment restrictions upon effectiveness of the Twenty-second Supplemental Resolution and the related amendments to the Agreement see "AMENDMENTS OF THE RESOLUTION AND THE AGREEMENT" and "APPENDIX C—GLOSSARY AND SUMMARY OF CERTAIN DOCUMENTS". The Authority's primary objective in investment of its available funds is preservation of principal. The Authority is not legally authorized to enter into reverse repurchase agreements. The Authority does not make leveraged investments.

## **RATINGS**

Moody's Investors Service, Inc. ("Moody's") has rated the uninsured Fiscal 1998 B Bonds "A2". Standard & Poor's Ratings Services, a division of The McGraw Hill Companies, Inc. ("S&P") has rated the uninsured Fiscal 1998 B Bonds "A-". Fitch Investors Service, L.P. ("Fitch") has rated the uninsured Fiscal 1998 B Bonds "A". Moody's has rated the Insured Fiscal 1998 B Bonds "Aaa". S&P has rated the Insured Fiscal 1998 B Bonds "AAA". Fitch has rated the Insured Fiscal 1998 B Bonds "AAA". Such ratings reflect only the views of Moody's, S&P and Fitch from which an explanation of the significance of such ratings may be obtained. There is no assurance that any or all of such ratings will continue for any given period of time or that any or all will not be revised downward or withdrawn entirely. Any such downward revision or withdrawal could have an adverse effect on the market prices of the uninsured Fiscal 1998 B Bonds or the Insured Fiscal 1998 B Bonds.

## **UNDERWRITING**

The Underwriters have jointly and severally agreed, subject to certain conditions, to purchase the Fiscal 1998 B Bonds from the Authority at a price which is \$2,577,378.11 less than the total of the initial offering prices. The Underwriters' obligations are subject to certain conditions precedent, and they will be obligated to purchase all of the Fiscal 1998 B Bonds if any of the Fiscal 1998 B Bonds are purchased. The Fiscal 1998 B Bonds may be offered and sold to certain dealers (including the Underwriters and other dealers depositing the Fiscal 1998 B Bonds into investment trusts) and others at prices lower than such public offering prices and such public offering prices may be changed, from time to time, by the Underwriters. The Underwriters have designated PaineWebber Incorporated as their Representative.

## **LEGALITY FOR INVESTMENT AND DEPOSIT**

Under the Act, the Fiscal 1998 B Bonds are securities in which all public officials and bodies of the State and all municipalities, all insurance companies and associations and other persons carrying on an insurance business, all banks, bankers, trust companies, savings banks and savings associations, including savings and loan associations, investment companies and other persons carrying on a banking business, and administrators, guardians, executors, trustees and other fiduciaries and all others persons whatsoever, who are now and may hereafter be authorized to invest in the Fiscal 1998 B Bonds or obligations of the State, may properly and legally invest funds including capital in their control or belonging to them in such Fiscal 1998 B Bonds. The Act further provides that the Fiscal 1998 B Bonds are securities which may be deposited with and may be received by all

public officers and bodies of the State and all municipalities for any purposes for which the deposit of bonds or other obligations of the State is or may hereafter be authorized.

## **FINANCIAL STATEMENTS**

The financial statements of the New York City Water and Sewer System as of and for the years ended June 30, 1996 and June 30, 1995 (the "Audited System Financial Statements") included in Appendix D to this Official Statement have been audited by KPMG Peat Marwick LLP, independent certified public accountants, to the extent indicated in their report thereon.

## **ENGINEERING FEASIBILITY LETTER AND FORECASTED CASH FLOWS**

Certain information contained in this Official Statement under the captions "CAPITAL IMPROVEMENT AND FINANCING PROGRAM—Capital Improvement Program", "CAPITAL IMPROVEMENT AND FINANCING PROGRAM—Current Capital Plan", "THE SYSTEM—The Water System—The Catskill System", "THE SYSTEM—The Water System—The Delaware System", "THE SYSTEM—The Water System—Water Distribution", "THE SEWER SYSTEM—Sewage Collection", "THE SEWER SYSTEM—Sewage Treatment Facilities", and "THE SEWER SYSTEM—Staffing Evaluation—Current Staffing" has been reviewed and independently evaluated by Metcalf & Eddy which has provided the opinion letter set forth in Appendix A confirming such information. Metcalf & Eddy also serves as a consulting engineer to DEP on capital projects relating to the System. As a result of occasional, routine litigation initiated by third parties arising from such projects, Metcalf & Eddy and the City have from time to time been either co-parties or adverse parties in such litigation.

Certain financial forecasts contained in this Official Statement in the tables titled "Sources and Uses of Capital Funds" under the caption "CAPITAL IMPROVEMENT AND FINANCING PROGRAM" and "Expenses", "Projected Revenues", "Projected System Expense" and "Forecasted Cash Flows" under the caption "FINANCIAL OPERATIONS" have been examined by Black & Veatch, to the extent and for the periods indicated in those tables. The conclusions of Black & Veatch with respect to the reasonableness of the forecasts are set forth in an opinion letter attached hereto as Appendix B. Black & Veatch has provided consulting services including feasibility studies, rate studies and organizational analyses to numerous clients in the water and wastewater industry, including over 100 medium and large jurisdictions.

## **TAX EXEMPTION**

The Internal Revenue Code of 1986 (the "Code") imposes certain requirements that must be met subsequent to the issuance and delivery of the Fiscal 1998 B Bonds for interest thereon to be and remain excluded from gross income for Federal income tax purposes. Noncompliance with such requirements could cause the interest on the Fiscal 1998 B Bonds to be included in gross income for Federal income tax purposes retroactive to the date of issue of the Fiscal 1998 B Bonds. The Authority has covenanted in the Supplemental Resolution authorizing issuance of the Fiscal 1998 B Bonds to comply with the applicable requirements of the Code in order to maintain the exclusion of the interest on the Fiscal 1998 B Bonds from gross income for Federal income tax purposes pursuant to Section 103 of the Code. In addition, the Authority and EFC will, in connection with bonds proposed to be issued by EFC pursuant to the Plan of Finance at substantially the same time as the Fiscal 1998 B Bonds, mutually covenant that they will each take such actions as may be necessary and within their control to ensure that the EFC bonds will continue to be obligations described in Section 103 of the Code.

In the opinion of Nixon, Hargrave, Devans & Doyle LLP, Bond Counsel to the Authority, under existing law, and assuming compliance with the aforementioned covenants, interest on the Fiscal 1998 B Bonds is excluded from gross income for Federal income tax purposes under Section 103 of the Code and is not treated as a preference item in calculating the alternative minimum tax imposed under the Code with respect to individuals and corporations. Interest on the Fiscal 1998 B Bonds is, however, included in the adjusted current

earnings of certain corporations for purposes of computing the alternative minimum tax imposed on such corporations. Bond Counsel is also of the opinion that the interest on the Fiscal 1998 B Bonds is exempt, under existing law, from personal income tax of the State of New York and its political subdivisions, including The City of New York.

### **Original Issue Discount**

Bond Counsel is further of the opinion that the difference between the principal amount of the Fiscal 1998 B Bonds (collectively the "Discount Bonds") and the initial offering price to the public (excluding bond houses, brokers or similar persons or organizations acting in the capacity of underwriters or wholesalers) at which price a substantial amount of Discount Bonds of the same maturity was sold constitutes original issue discount which is excluded from gross income for Federal income tax purposes to the same extent as interest on the Fiscal 1998 B Bonds. Further, such original issue discount accrues actuarially on a constant interest rate basis over the term of each Discount Bond and the basis of each Discount Bond acquired at such initial offering price by an initial purchaser thereof will be increased by the amount of such accrued original issue discount. The accrual of original issue discount may be taken into account as an increase in the amount of tax-exempt income for purposes of determining various other tax consequences of owning Discount Bonds, even though there will not be a corresponding cash payment. Owners of the Discount Bonds are advised that they should consult with their own advisors with respect to the State and local tax consequences of owning Discount Bonds.

### **Certain Federal Tax Information**

**General.** The following is a discussion of certain additional tax matters under existing statutes. It does not purport to deal with all aspects of Federal taxation that may be relevant to particular investors. Prospective investors, particularly those who may be subject to special rules, are advised to consult their own tax advisors regarding the Federal tax consequences of owning and disposing of the Fiscal 1998 B Bonds, as well as any tax consequences arising under the laws of any state or other taxing jurisdiction.

**Environmental Tax.** The Code imposes an environmental tax with respect to corporations on the excess of a corporation's modified alternative minimum taxable income over \$2 million. The environmental tax applies with respect to taxable years beginning before January 1, 1996.

**Social Security and Railroad Retirement Payments.** The Code provides that interest on tax-exempt obligations is included in the calculation of modified adjusted gross income in determining whether a portion of Social Security or railroad retirement benefits received are to be included in taxable income.

**Branch Profits Tax.** The Code provides that interest on tax-exempt obligations is included in effectively connected earnings and profits for purposes of computing the branch profits tax on certain foreign corporations doing business in the United States.

**Borrowed Funds.** The Code provides that interest paid (or deemed paid) on borrowed funds used during a tax year to purchase or carry tax-exempt obligations is not deductible. In addition, under rules used by the Internal Revenue Service for determining when borrowed funds are considered used for the purpose of purchasing or carrying particular assets, the purchase of obligations may be considered to have been made with borrowed funds even though the borrowed funds are not directly traceable to the purchase of such obligations.

**Property and Casualty Insurance Companies.** The Code contains provisions relating to property and casualty insurance companies whereunder the amount of certain loss deductions otherwise allowed is reduced (in certain cases below zero) by a specified percentage of, among other things, interest on tax-exempt obligations acquired after August 7, 1986.

**Financial Institutions.** The Code provides that commercial banks, thrift institutions and other financial institutions may not deduct the portion of their interest expense allocable to tax-exempt obligations acquired after August 7, 1986, other than certain "qualified" obligations. The Fiscal 1998 B Bonds are not "qualified" obligations for this purpose.

S Corporations. The Code imposes a tax on excess net passive income of certain S corporations that have subchapter C earnings and profits. Interest on tax-exempt obligations must be included in passive investment income for purposes of this tax.

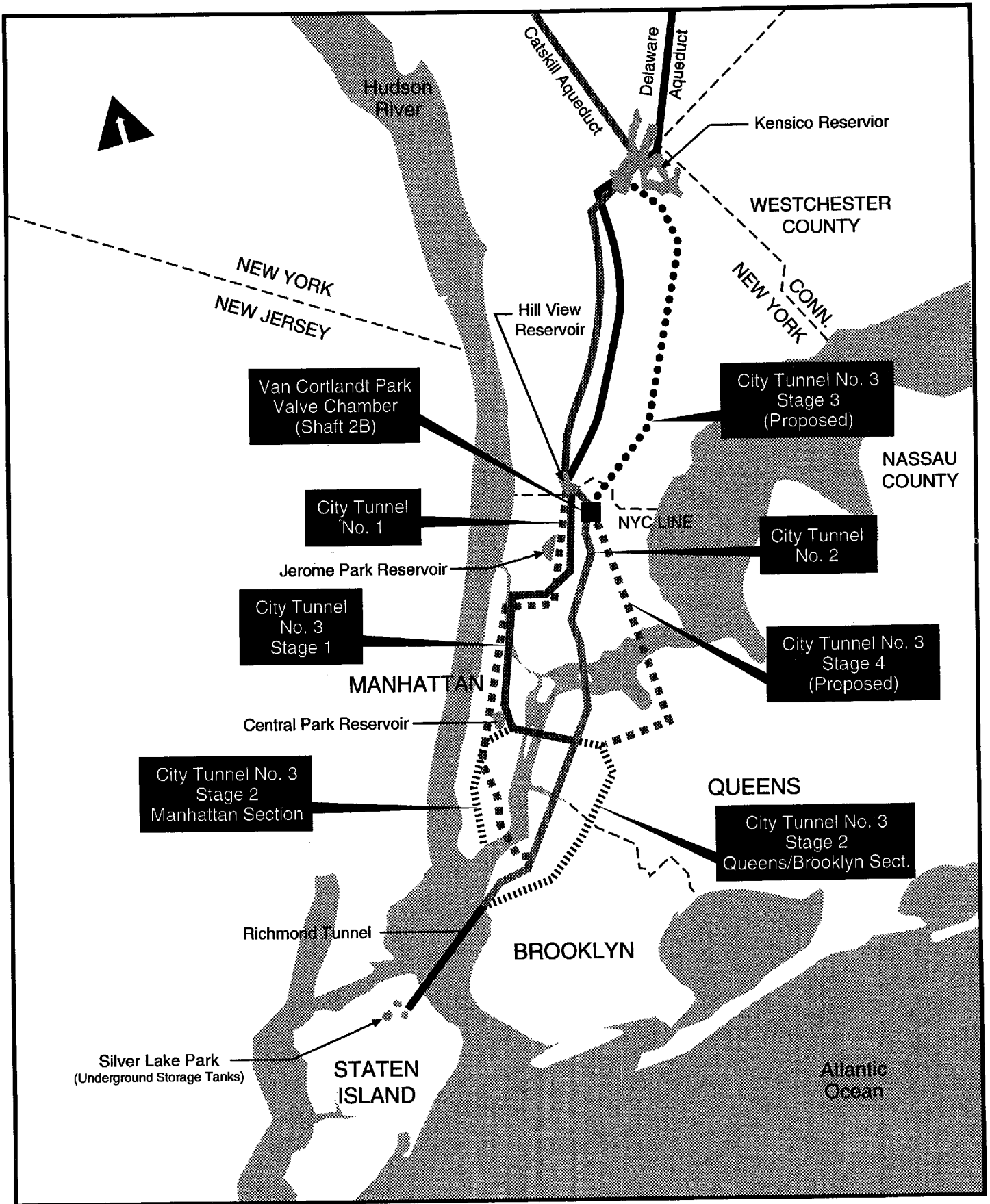
Earned Income Credit. For any taxable year beginning after December 31, 1995, the Code denies the earned income credit to persons otherwise eligible for it if the aggregate amount of disqualified income of the taxpayer for the taxable year exceeds \$2,200, subject to adjustment for inflation for taxable years beginning after December 31, 1996. Interest on the Bonds will constitute disqualified income for this purpose.

Changes in Federal Tax Law and Post Issuance Events. From time to time proposals are introduced in Congress that, if enacted into law, could have an adverse impact on the potential benefits of the exclusion from gross income for Federal income tax purposes of the interest on the Fiscal 1998 B Bonds, and thus on the economic value of the Fiscal 1998 B Bonds. This could result from reductions in Federal income tax rates, changes in the structure of the Federal income tax rates, changes in the structure of the Federal income tax or its replacement with another type of tax, repeal of the exclusion of the interest on the Fiscal 1998 B Bonds from gross income for such purposes, or otherwise. It is not possible to predict whether any legislation having an adverse impact on the tax treatment of holders of the Fiscal 1998 B Bonds may be proposed or enacted.

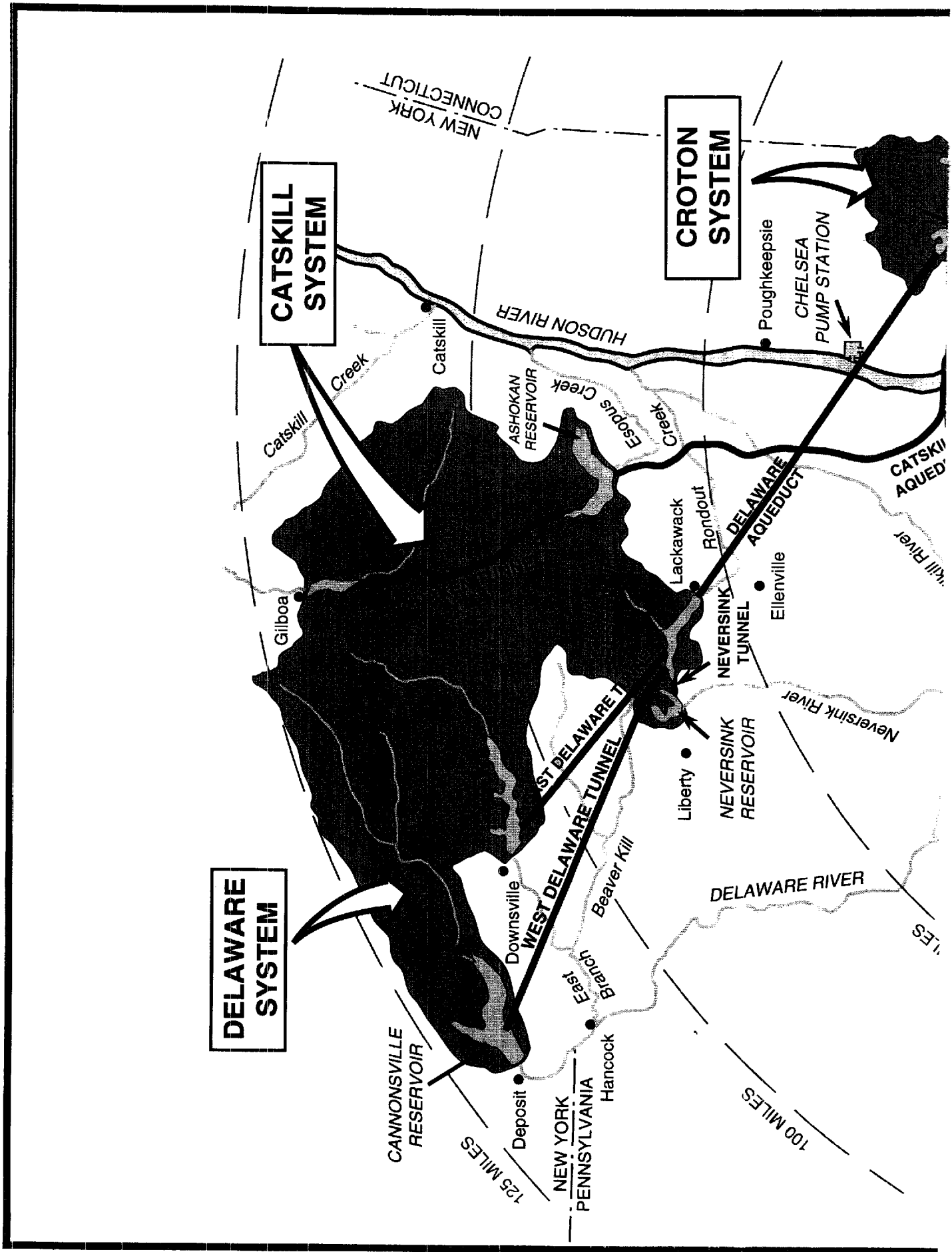
Bond Counsel has not undertaken to advise in the future whether any events after the date of issuance and delivery of the Fiscal 1998 B Bonds may affect the tax status of interest on the Fiscal 1998 B Bonds. Bond Counsel expresses no opinion as to any Federal, State or local tax law consequences with respect to the Fiscal 1998 B Bonds, or the interest thereon, if any action is taken with respect to the Fiscal 1998 B Bonds or the proceeds thereof upon the advice or approval of other counsel.

NEW YORK CITY MUNICIPAL WATER  
FINANCE AUTHORITY

By /s/ MARK PAGE  
Executive Director



**New York City Water Tunnels**



**DELAWARE SYSTEM**

**CATSKILL SYSTEM**

**CROTON SYSTEM**

DELAWARE RIVER

HUDSON RIVER

CATSKILL AQUEDUCT

DELAWARE AQUEDUCT

WEST DELAWARE TUNNEL

NEVERSINK RESERVOIR

NEVERSINK TUNNEL

CANNONSVILLE RESERVOIR

Downsville

Hancock

East Branch

Beaver Kill

Liberty

Ellenville

Lackawack

Rondout

ASHOKAN RESERVOIR

Esopus Creek

Catskill Creek

Catskill

CHELSEA PUMP STATION

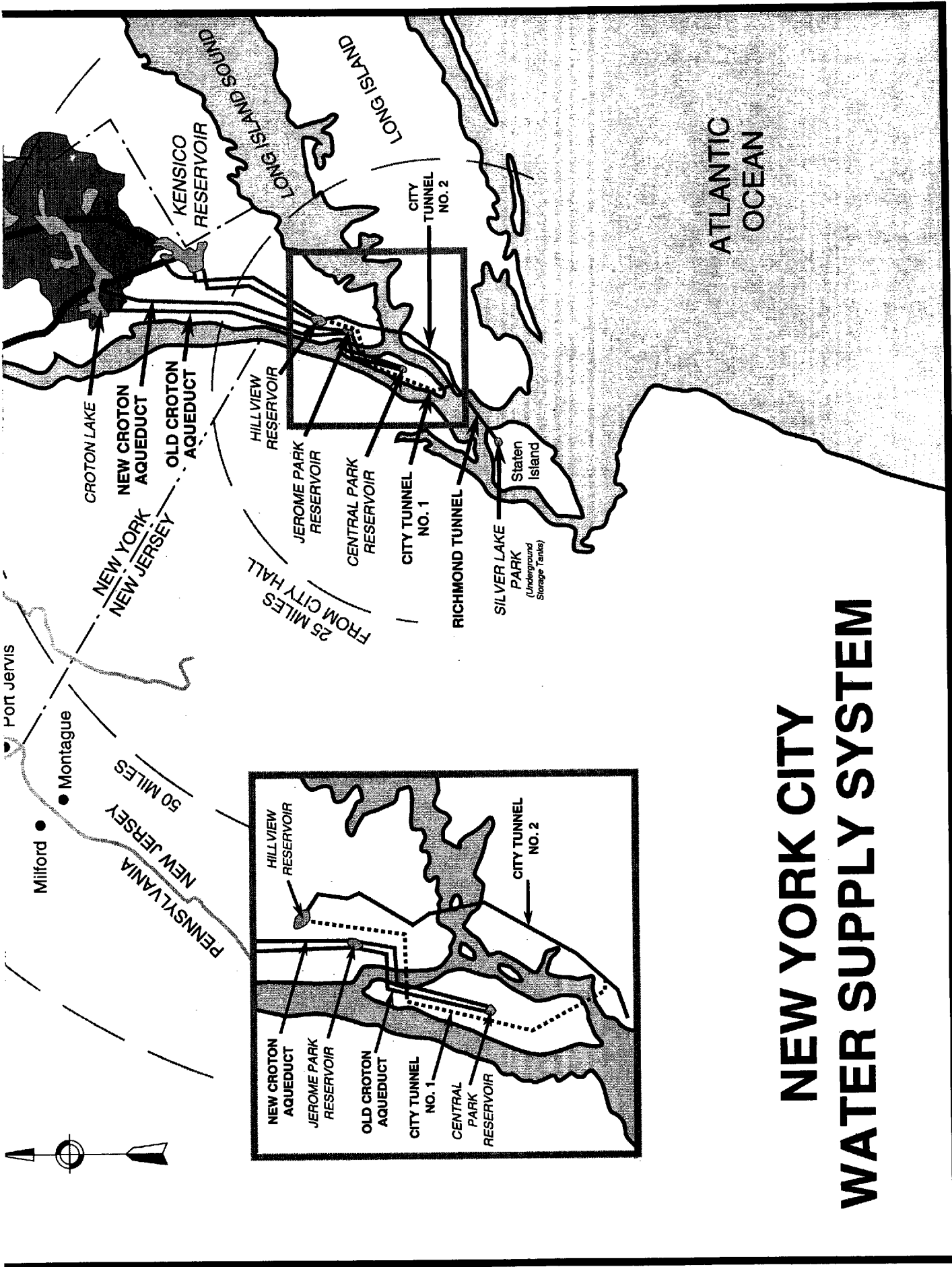
Poughkeepsie

NEW YORK  
CONNECTICUT

NEW YORK  
PENNSYLVANIA

100 MILES





# NEW YORK CITY WATER SUPPLY SYSTEM

**Plant Location**                      **Capacity (MGD)**

**MANHATTAN**

Wards Island	250
North River	170

**BRONX**

Hunts Point	200
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**BROOKLYN**

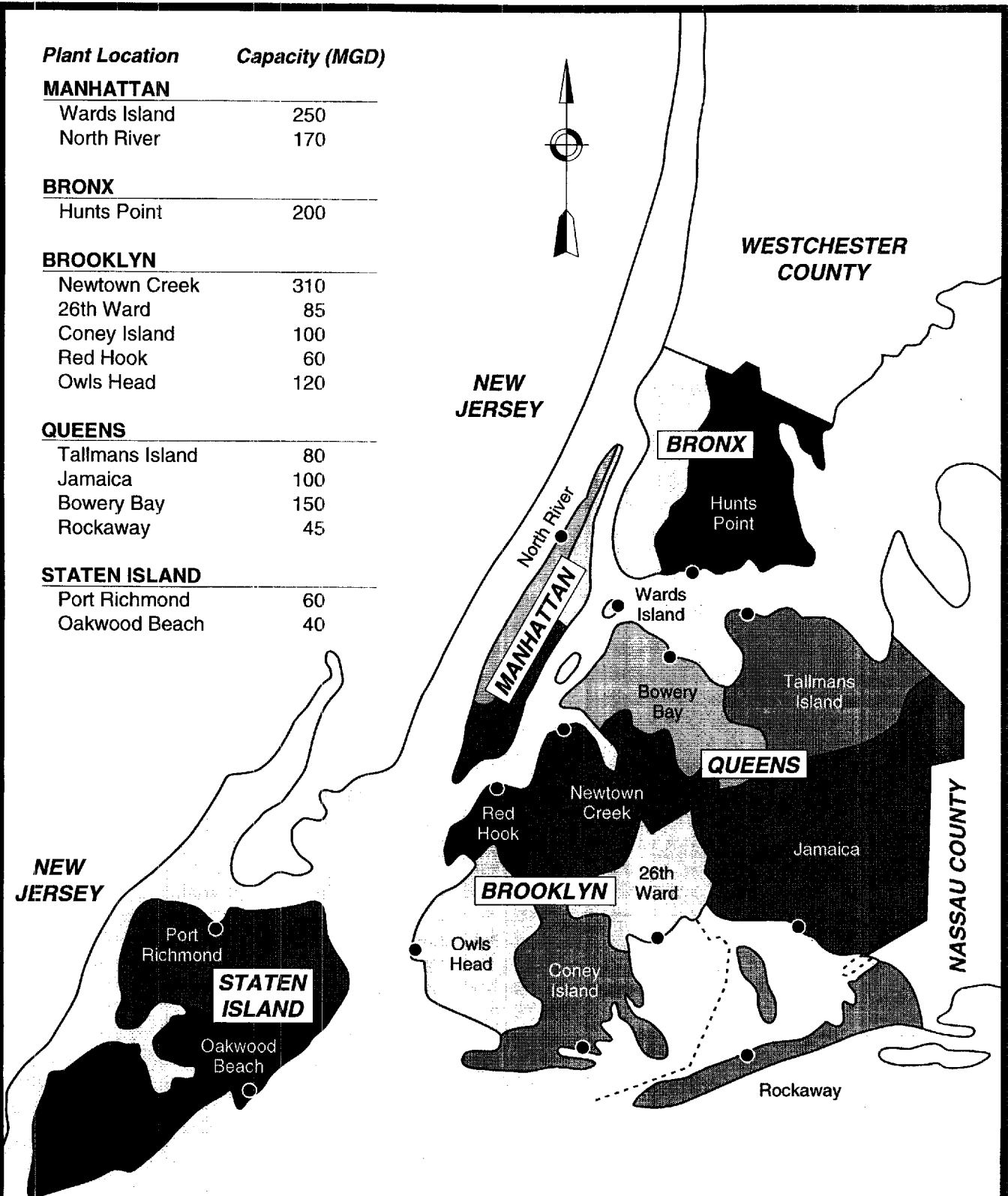
Newtown Creek	310
26th Ward	85
Coney Island	100
Red Hook	60
Owls Head	120

**QUEENS**

Tallmans Island	80
Jamaica	100
Bowery Bay	150
Rockaway	45

**STATEN ISLAND**

Port Richmond	60
Oakwood Beach	40



● Indicates Plant Location Within Drainage District

**LETTER OF  
METCALF & EDDY,  
CONSULTING ENGINEERS**

September 18, 1997

Mr. Mark Page  
Executive Director  
New York City Municipal Water Finance Authority  
75 Park Place, 6th Floor  
New York, New York 10007

Subject: New York City Municipal Water Finance Authority  
Water and Sewer System Revenue Bonds,  
Fiscal 1998 Series B

Dear Mr. Page:

We hereby submit the opinion of Metcalf & Eddy of New York, Inc. ("Metcalf & Eddy") on the Engineering Feasibility of the Water and Sewer System serving The City of New York (the "City"). Capitalized terms used herein and not otherwise defined have the meanings ascribed to such terms in the Official Statement.

Based on the information set forth in the Official Statement, our experience and our analyses during the preparation of the 1983 feasibility study, the methodology described below and subject to the reliances and assumptions made throughout this letter, Metcalf & Eddy concludes that overall the water and sewer system (the "System") serving the City continues to be operated in a professional and prudent manner. Further, Metcalf & Eddy is of the opinion that:

- The condition of the System continues to receive the highest rating of our three rating categories (adequate).
- The expense allocations for Fiscal Year 1998 appear to be adequate for the continued reliable operation of the System.
- The Capital Improvement Program (the "CIP") and the Current Capital Plan are responsive to the long-term operating requirements of the service area.
- Staffing levels of the System appear adequate for proper operation and maintenance.

Metcalf & Eddy hereby consents to the inclusion of those opinions and conclusions attributed to it in the Official Statement.

#### **Purpose and Scope**

This letter has been prepared to document the results of analyses carried out during the period of August 1983 to the present by personnel of Metcalf & Eddy in connection with the issuance of the Water and Sewer System Revenue Bonds, Fiscal 1998 Series B by the New York City Municipal Water Finance Authority (the "Authority"). Certain studies and analyses were performed in anticipation of the creation of the Authority and were used in developing the information in the Official Statement under the captions: "CAPITAL IMPROVEMENT AND FINANCING PROGRAM—Capital Improvement Program", "CAPITAL IMPROVEMENT AND FINANCING PROGRAM—Current Capital Plan", "THE SYSTEM—The Water System—The Catskill System", "THE SYSTEM—The Water System—The Delaware System", "THE SYSTEM—The Water System—Water Distribution", "THE SEWER SYSTEM—Sewage Collection", "THE SEWER SYSTEM—Sewage Treatment Facilities", and "THE SEWER SYSTEM—Staffing Evaluation—Current Staffing". The following sets forth a brief outline of the major tasks addressed:

- An overview of the System's service area and major facilities, including a general assessment of the capacity and condition of existing water, wastewater and drainage facilities and a review of recently completed improvements.
- An analysis of the CIP for the period 1998-2007 and the funding needed to carry out the CIP and ongoing capital contracts commenced prior to the CIP.
- An analysis of the management of the System and its current and anticipated operating programs.

Since 1983 Metcalf & Eddy has provided engineering services related to the City's Water and Wastewater Operations Evaluation Study. During this period Metcalf & Eddy has performed an evaluation of the condition of the System, independently reviewed the capital plans for water and wastewater programs, and jointly with the

rate consultant reviewed the operating programs of the New York City Department of Environmental Protection ("DEP"). Ten topics were addressed in this effort as listed below.

- Present Condition of Physical Facilities
- Remaining Useful Life of Facilities
- Reliability of Utility Systems
- Operation and Maintenance Programs
- Current Utility Use
- Maximum Existing Capacity
- Needs for Routine Maintenance, Upgrading and Expansion
- Evaluation of the Impact of Legal Mandates
- Overview of Present Capital Improvement Program
- Safety Practices and Potential for Catastrophe

### **Methodology**

Interviews with staff members of the Authority and the City were conducted, and current engineering and financial reports, System operating data and other documents were reviewed and major facilities were inspected. Audited financial statements of the City and data supplied by the Authority were also reviewed to identify historical costs and revenues. The evaluation of current needs and future conditions was made by analyzing historical data, assessing the effectiveness of current City maintenance programs, reviewing the plans of key outside agencies, and taking into account current trends and the anticipated impact of the CIP.

The physical condition of the facilities was rated by Metcalf & Eddy. A uniform rating system, standard among engineering firms providing similar services, was established consisting of three rating categories—adequate, marginal, and inadequate as described below:

- Adequate: Shows no signs of deterioration, meets design intent, and requires only routine maintenance to meet or exceed expected useful life.
- Marginal: Facility is functional but does not meet design intent, and requires non-routine maintenance or capital replacement to restore to adequate condition.
- Inadequate: Facility does not provide functional operation, and requires major reconstruction to restore to adequate condition.

### **The Consulting Engineer**

Metcalf & Eddy has served the City as consulting engineers for over 30 years in capacities dealing with water supply, water distribution, sewage collection, and wastewater treatment. Metcalf & Eddy is one of the largest consulting engineering firms and is recognized in the United States and internationally as a leader in services to the water and wastewater industry.

We have no responsibility to update this letter or the information provided in the Official Statement for the captioned sections described above for events and circumstances occurring after the date of this letter.

Very truly yours,



JAMES ANDERSON  
President  
Metcalf & Eddy of New York, Inc.

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**LETTER OF BLACK & VEATCH,  
RATE CONSULTANTS**



## BLACK & VEATCH

1211 Avenue of the Americas, 42nd Floor, New York, NY, 10036, Telephone: (212) 382-2242, Fax: (212) 382-1575

September 18, 1997

Mr. Mark Page, Executive Director  
New York City Municipal Water Finance Authority  
75 Park Place, 6th Floor  
New York, New York 10007

Re: New York City Municipal Water Finance Authority  
Water and Sewer System Revenue Bonds, Fiscal 1998 Series B

Dear Mr. Page:

The purpose of this letter is to summarize the conclusions of our independent analysis of the financial forecast of the Authority (the "Forecasted Cash Flows") for fiscal years 1998 through 2003 (the "Reporting Period") in connection with the issuance of \$449,525,000 Water and Sewer System Revenue Bonds, Fiscal 1998 Series B (the "Series B Bonds") by the New York City Municipal Water Finance Authority (the "Authority"). Proceeds from the Series B Bonds are to be used: (i) to reimburse moneys to be drawn under irrevocable letters of credit to provide for the payment of the principal of and interest on \$400 million aggregate principal amount of the Authority's outstanding Commercial Paper Notes, (ii) to pay certain costs of issuance and (iii) to fund certain reserves. In conducting our analysis we have prepared the following tables which are included in the Official Statement under the headings "Capital Improvement and Financing Program" and "Financial Operations":

- Sources and Uses of Capital Funds
- Future Debt Service Requirements
- Projected Revenues
- Projected System Expense
- Forecasted Cash Flows

The forecast includes provisions for the financing of improvements to The City of New York (the "City") Water and Sewer System (the "System") as reflected in the Capital Improvement Program (the "CIP") for the Reporting Period. The Forecasted Cash Flows set forth the ability of the System to meet the operating costs, working capital needs and other financial requirements of the System, including the debt service requirements associated with the Outstanding Bonds issued under the Authority's General Revenue Bond Resolution (the "Resolution") and obligations issued under the Authority's Second General Resolution (the "Second Resolution"), and additional Bonds and Second Resolution Bonds whose issuance by the Authority during the six years ending June 30, 2003 is anticipated.

Revenues pledged to secure the Authority's Bonds are to be derived from the following sources: (i) all Revenues, (ii) all moneys or securities in any of the Funds and Accounts, and (iii) all other monies and securities to be received, held or set aside by the Authority or by any Fiduciary pursuant to the Resolution. The term "Revenues", as defined by the Resolution, includes, but is not limited to, all rents, fees, charges and other income and receipts derived by the New York City Water Board (the "Board") from users of the System, and certain investment proceeds received by the Board.



Moneys pledged to secure bonds issued under the Second Resolution are to be derived from:(i) all available amounts on deposit in the Subordinated Indebtedness Fund established under the Resolution, (ii) all moneys or securities in any of the funds and accounts established under the Second General Resolution, except the Arbitrage Rebate Fund and the Debt Service Reserve Fund, and (iii) Other Moneys.

The Forecasted Cash Flows summarize the anticipated financial operations of the Authority for the Reporting Period. We have reviewed, to the extent practicable, the Authority's books, records, financial reports, and statistical data, and have conducted such other investigations and analyses as deemed necessary to assemble and analyze the forecast of revenues, revenue requirements, and debt service coverage for the Reporting Period. We have performed various financial tests and analyses necessary to support our findings and conclusions. The Authority uses a fiscal year ending June 30, and all references in the Official Statement to a fiscal year ("Fiscal Year") relate to the 12 month period ending June 30 of the year shown.

Proposed improvements and additions to the System under the CIP for the Reporting Period were independently evaluated and confirmed by Metcalf & Eddy of New York, Inc. ("Metcalf & Eddy"). The Forecasted Cash Flows rely upon the conclusions of Metcalf & Eddy regarding the level of planned capital improvement expenditures required during the Reporting Period to maintain the System in good working order.

Based upon our studies, we offer the following opinions and conclusions:

1. It is our opinion that Revenues (including projected revenue increases resulting from anticipated future rate increases to be implemented by the Board), as set forth in the Forecasted Cash Flows, are currently and will be sufficient to meet the following requirements during the Reporting Period:

a. One hundred and fifteen percent (115%) of the principal of and interest on all Bonds issued under the Resolution, as the same shall become due and payable, for which such Revenues are pledged;

b. One hundred percent (100%) of the principal of and interest on bonds issued under the Second Resolution and other subordinate obligations payable from Revenues;

c. One hundred percent (100%) of all expenses of operation, maintenance, and repair of the water and wastewater system; and

d. One hundred percent (100%) of other Required Deposits as required by the Resolution.

In addition, revenues are adequate to make all payments to the City.

2. In the analysis of the forecast of future operations summarized in the Official Statement, Black & Veatch has reviewed certain assumptions with respect to conditions, events and circumstances which may occur in the future. We believe that these assumptions are reasonable and attainable, although actual results may differ from those forecast as influenced by the conditions, events and circumstances which actually occur.

3. In our opinion, the water and wastewater rates, fees, and charges of the Board, including projected increases, compare favorably to the rates and charges of other major cities and are reasonable.

We appreciate the opportunity to be of service to the Authority in this important matter.

Very truly yours,

**BLACK & VEATCH**

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**GLOSSARY AND SUMMARY OF CERTAIN DOCUMENTS**

## GLOSSARY AND SUMMARY OF CERTAIN DOCUMENTS

### GLOSSARY

Set forth below are definitions of certain terms contained in the Agreement, the Lease and the Resolution and not otherwise defined in this Official Statement.

**Adjusted Aggregate Debt Service:** For any Fiscal Year and as of any date of calculation is the sum of the Adjusted Debt Service for all Series of Bonds Outstanding during such Fiscal Year.

**Adjusted Debt Service:** For any Fiscal Year, as of any date of calculation and with respect to any Series of Bonds, is the Debt Service for such Fiscal Year for such Series except that, if any Refundable Principal Installment of such Series of Bonds is included in Debt Service for such Fiscal Year, Adjusted Debt Service shall mean Debt Service determined as if each such Refundable Principal Installment had been payable over a period extending from the due date of such Refundable Principal Installment through the last date on which such Series of Bonds could have been stated to mature under the Act as in effect on the date of issuance of such Series, in installments which would have required equal annual payments of Principal Installments and interest over such period. Interest deemed payable in any Fiscal Year after the actual due date of any Refundable Principal Installment of any Series of Bonds shall be calculated at the actual interest cost payable on the Bonds of such Series (using the actuarial method of calculation).

**Aggregate Debt Service:** For any Fiscal Year, as of any date of calculation, the sum of the Debt Service for all Bonds Outstanding during such Fiscal Year.

**Authority Expenses:** All reasonable or necessary current expenses of the Authority, including all salaries, administrative, general, commercial, engineering, advertising, public notice, auditing and legal expenses, insurance and surety bond premiums, fees paid to banks, insurance companies or other financial institutions for the issuance of Credit Facilities, consultants' fees and charges, payment to pension, retirement, health and hospitalization funds, costs of public hearings, ordinary and current rentals of equipment and other property, lease payments for real property or interests therein, expenses, liabilities and compensation of any Fiduciary and all other expenses necessary, incidental or convenient for the efficient operation of the Authority.

**Authorized Newspaper:** The Bond Buyer or any other newspaper of general circulation printed in the English language and customarily published at least once a day for at least five days (other than legal holidays) in each calendar week in the Borough of Manhattan, City and State of New York, designated by the Authority.

**Authorized Representative:** In the case of both the Authority and the Board, their respective Chairman or Executive Director, or such other person or persons so designated by resolution of the Authority or the Board, as the case may be, and in the case of the City, the Mayor, unless a different City official is designated to perform the act or sign the document in question.

**Bond or Bonds:** For purposes of the Agreement and the Resolution, the bonds, notes or other evidences of indebtedness issued by the Authority under and pursuant to the Act and the Resolution, including Parity Bond Anticipation Notes and Parity Reimbursement Obligations; but shall not mean Subordinated Indebtedness or other Bond Anticipation Notes or Reimbursement Obligations; and for purposes of the Lease, means any bonds, notes or other evidences of indebtedness for borrowed money issued by the Authority.

**Bond Counsel's Opinion:** An opinion signed by an attorney or firm of attorneys of nationally recognized standing in the field of law relating to revenue bonds of municipalities and public agencies, selected by the Authority and satisfactory to the Trustee.

**Bond Payment Date:** June 15 and December 15 of each year; provided, however, that if any such day is not a Business Day, then the Bond Payment Date shall be the next succeeding Business Day.

**Business Day:** Any day which is not a Saturday, Sunday or a day on which the New York Stock Exchange, banking institutions chartered by the State or the United States of America or the Note Trustee are legally authorized to close in the City.

**Cash Flow Requirement:** For each Fiscal Year and as of any date of certification, the amount, certified by the Authority to the Trustee and the Board equal to the difference between (A) the sum of (i) the estimated Aggregate Debt Service for such Fiscal Year, (ii) the Projected Debt Service for such Fiscal Year, (iii) the estimated Authority Expenses for such Fiscal Year, and (iv) the other Required Deposits estimated for such Fiscal Year and (B) (i) if the certification is made prior to the commencement of the Fiscal Year, the amount anticipated by the Authority as of such date of certification to be held by the Trustee, as of the first day of such Fiscal Year, in the Revenue Fund and (ii) if the certification is made after the commencement of such Fiscal Year, the amount which had been anticipated pursuant to (B) (i) above.

**Consulting Engineer:** Metcalf & Eddy of New York, Inc. or such other independent engineer or engineering firm of recognized standing selected by the Authority and satisfactory to the Board.

**Corporation:** The New York State Environmental Facilities Corporation and any successor entity which may succeed to its rights and duties respecting the State Revolving Fund.

**Cost or Costs of a Water Project:** The cost of construction, as such term is defined in the Act, including, without limiting the generality of the foregoing, the erection, alteration, improvement, increase, enlargement or rehabilitation of the System or a Water Project, the inspection and supervision thereof, the engineering, architectural, legal, fiscal, economic and environmental investigations and studies, designs, surveys, plans, specifications, procedures and other actions incidental thereto; the cost of the acquisition of all Property; the cost of demolishing, removing or relocating any buildings or structures on lands so acquired (including the cost of acquiring any lands to which such buildings or structures may be moved or relocated); the cost of all systems, facilities, machinery, appurtenances, equipment, financing charges and interest prior to, during and after construction (if not paid or provided for from revenues or other sources); the cost of engineering and architectural surveys, plans and specifications; the cost of consultants' and legal services; the cost of lease guarantee or bond insurance; other expenses necessary, reasonably related or incidental to the construction of such Water Project and the financing of the construction thereof, including the cost of Credit Facilities, the amounts authorized in the Resolution to be paid into any reserve or other special fund from the proceeds of Bonds and the financing or the placing of any Water Project in operation, including reimbursement to any governmental entity or any other person for expenditures that would be Costs of such Water Project and all claims arising from any of the foregoing.

UPON THE EFFECTIVE DATE OF THE TWENTY-SECOND SUPPLEMENTAL RESOLUTION, THE FOLLOWING DEFINITION WILL BE ADDED TO THE GENERAL RESOLUTION

**Counterparty** shall mean an entity whose senior long term debt obligations, or whose obligations under an Interest Rate Exchange Agreement are guaranteed by a financial institution whose senior long term debt obligations, have a rating (at the time the subject Interest Rate Exchange Agreement is entered into) of Aa or better by Moody's Investors Service and AA or better by Standard & Poor's Ratings Services.

**Credit Facility:** A letter of credit, revolving credit agreement, standby purchase agreement, surety bond, insurance policy or similar obligation, arrangement or instrument issued by a bank, insurance company or other financial institution which provides for payment of all or a portion of the Principal Installments or interest due on any Series of Bonds or provides funds for the purchase of such Bonds or portions thereof.

**Debt Service:** For any Fiscal Year or part thereof, as of any date of calculation and with respect to any Series, means an amount equal to the sum of (a) interest payable during such Fiscal Year or part thereof on Bonds of such Series, except to the extent that such interest is to be paid from amounts representing Capitalized Interest and (b) the Principal Installments of the Bonds of such Series payable during such Fiscal Year or part

thereof. Such interest and Principal Installments for such Series shall be calculated on the assumption that (x) no Bonds of such Series Outstanding at the date of calculation will cease to be Outstanding except by reason of the payment thereof upon stated maturity or upon mandatory redemption by application of Sinking Fund Installments and (y) Variable Rate Bonds will bear interest at the greater of (A) the rate or rates which were assumed by the Authority in the Authority Budget for such Fiscal Year to be borne by Variable Rate Bonds during such Fiscal Year or (B) the actual rate or rates borne by such Variable Rate Bonds on such date of calculation.

UPON THE EFFECTIVE DATE OF THE TWENTY-SECOND SUPPLEMENTAL RESOLUTION, SUBPARAGRAPH (B) OF THE DEFINITION OF DEBT SERVICE WILL BE AMENDED TO READ AS FOLLOWS: (B) THE AVERAGE RATE OR RATES BORNE DURING SUCH FISCAL YEAR ON VARIABLE RATE BONDS OUTSTANDING DURING THE 12 CALENDAR MONTHS PRECEDING THE DATE OF CALCULATION.

**Debt Service Reserve Requirement:** As of any date of calculation, and for any Fiscal Year, the amount equal to the maximum Adjusted Aggregate Debt Service in the current or any future Fiscal Year on all Bonds Outstanding provided, however, that, with respect to any Bonds secured by a Special Credit Facility, the Supplemental Resolution authorizing such Bonds may provide that the Debt Service Reserve Requirement for such Bonds be an amount not in excess of the maximum Adjusted Debt Service payable on such Bonds in the current or any future Fiscal Year.

UPON THE EFFECTIVE DATE OF THE TWENTY-SECOND SUPPLEMENTAL RESOLUTION, THE DEFINITION OF DEBT SERVICE RESERVE REQUIREMENT WILL BE AMENDED TO READ AS FOLLOWS:

**Debt Service Reserve Requirement** shall mean, as of any date of calculation, and for any Fiscal Year, the amount equal to the maximum Adjusted Aggregate Debt Service in the current or any future Fiscal Year on all Bonds Outstanding; provided, however, that, if (i) the payment of the Principal Installments of or interest on any Series of Bonds or portion thereof is secured by a Special Credit Facility, (ii) the payment of the Tender Option Price of any Option Bond of a Series is secured by a Special Credit Facility or (iii) the Authority has determined in a Supplemental Resolution authorizing the issuance of a Series of Bonds that such Series of Bonds will not be secured by the Common Account in the Debt Service Reserve Fund, the Supplemental Resolution authorizing such Series may specify the Debt Service Reserve Requirement, if any, for the Bonds of such Series.

**DEC:** The New York State Department of Environmental Conservation and any successor entity which may succeed to its rights and duties respecting the State Revolving Fund.

**Defeasance Obligations:** The obligations described in clause (ii) of the definition of Investment Securities below.

**Financial Guaranties:** One or more of the following: (i) irrevocable, unconditional and unexpired letters of credit issued by a banking institution the senior long-term debt obligations of which (or the holding company of such banking institution) have (at the time of issue of such letter of credit) a rating of Aa2 or better by Moody's Investors Service or AA or better by Standard & Poor's Corporation or (ii) an irrevocable and unconditional policy or policies of insurance in full force and effect and issued by a municipal bond insurer the obligations insured by which are eligible for a rating of Aa or better by Moody's Investors Service or AA or better by Standard & Poor's Corporation; in each case providing for the payment of sums for the payment of Principal Installments of and interest on Bonds in the manner provided in Section 508 of the Resolution; and providing further that any such Financial Guaranty must be drawn upon, on a date which is at least thirty days prior to the expiration date of such Financial Guaranty, in an amount equal to the deficiency which would exist if the Financial Guaranty expired, unless a substitute Financial Guaranty is acquired prior to such thirtieth day as provided in a related Supplemental Resolution.

UPON THE EFFECTIVE DATE OF THE TWENTY-SECOND SUPPLEMENTAL RESOLUTION, THE DEFINITION OF FINANCIAL GUARANTIES WILL BE AMENDED TO READ AS FOLLOWS:

**Financial Guaranties** shall mean one or more of the following: (i) irrevocable, unconditional and unexpired letters of credit issued by banking institutions the senior long-term debt obligations of which (or the holding company of any such banking institution) have (at the time of issue of such letter of credit) a rating of Aa2 or better by Moody's Investors Service and AA or better by Standard & Poor's Ratings Services; or (ii) an irrevocable and unconditional policy or policies of insurance in full force and effect issued by municipal bond insurers the obligations insured by which are eligible for a rating of Aa or better by Moody's Investors Service and AA or better by Standard & Poor's Ratings Services; in each case providing for the payment of sums for the payment of Principal Installments of and interest on Bonds in the manner provided in Section 508 of the Resolution; and providing further that any Financial Guaranty of the type described in (i) above must be drawn upon, on a date which is at least thirty (30) days prior to the expiration date of such Financial Guaranty, in an amount equal to the deficiency which would exist if the Financial Guaranty expired, unless a substitute Financial Guaranty is acquired prior to such expiration date as provided in a related Supplemental Resolution.

**Fiscal Year:** The twelve-month period commencing on July 1 of each year; provided, however, that the Authority, the Board and the City may agree on a different twelve-month period as the Fiscal Year and in such event the dates set forth in the Agreement, the Lease and the Resolution shall be adjusted accordingly.

**Government Obligation:** A direct obligation of the United States of America, an obligation the principal of, and interest on which are guaranteed as to full and timely payment by the United States of America, an obligation (other than an obligation subject to variation in principal repayment) to which the full faith and credit of the United States of America are pledged, an obligation of a federal agency guaranteed as to full and timely payment by the United States of America and approved by the Authority, and a certificate or other instrument which evidences the ownership of, or the right to receive all or a portion of the payment of, the principal of or interest on, direct obligations of the United States of America.

UPON THE EFFECTIVE DATE OF THE TWENTY-SECOND SUPPLEMENTAL RESOLUTION, THE FOLLOWING DEFINITION WILL BE ADDED TO THE RESOLUTION:

**Interest Rate Exchange Agreement** shall mean any financial arrangement (i) that is entered into by the Authority with an entity that is a Counterparty at the time the arrangement is entered into; (ii) which provides that the Authority shall pay to such entity an amount based on the principal amount of a Series of Bonds, and that such entity shall pay to the Authority an amount based on the principal amount of such Series of Bonds, in each case computed in accordance with a formula set forth in such agreement, or that one shall pay to the other any net amount due under such arrangement; (iii) which has been designated in writing to the Trustee by an Authorized Representative of the Authority as an Interest Rate Exchange Agreement with respect to a Series of Bonds and (iv) which, in the opinion of Bond Counsel, will not adversely effect the exclusion of interest on Bonds from gross income for the purposes of federal income taxation.

**Investment Securities:** Include any of the following securities, if and to the extent the same are at the time legal investments by the Authority of the funds to be invested therein and conform to the policies set forth in any investment guidelines adopted by the Authority and in effect at the time of the making of such investment:

(i) direct obligations of, or obligations guaranteed as to principal and interest by, the State or direct obligations of any agency or public authority thereof provided such obligations are rated, at the time of purchase, in one of the two highest rating categories by a Rating Agency;

(ii) (A) any bonds or other obligations which as to principal and interest constitute direct obligations of, or are guaranteed by, the United States of America, including obligations of any agency thereof or corporation which has been or may hereafter be created pursuant to an Act of Congress as an agency or instrumentality of the United States of America to the extent unconditionally guaranteed by the United States of America or (B) any other receipt, certificate or other evidence of an ownership interest in obligations or in specified portions thereof (which may consist of specified portions of the interest thereon) of the character described in subclause (A) of this clause (ii);

(iii) obligations of any agency, subdivision, department, division or instrumentality of the United States of America; or obligations fully guaranteed as to interest and principal by any agency, subdivision, department, division or instrumentality of the United States of America;

(iv) banker's acceptances or certificates of deposit issued by a commercial bank with its principal place of business within the State and having a capital and surplus of more than \$100,000,000;

(v) corporate securities, including commercial paper and fixed income obligations, which are, at the time of purchase, rated by a Rating Agency designated by the Authority in its highest rating category for comparable types of obligations; and

(vi) any repurchase agreement which is fully collateralized by any one or more of the securities described in clause (ii)(A) above; provided, however, that any such repurchase agreement shall (A) not be for a period in excess of 90 days, (B) provide that the Authority or the Trustee (or the agent thereof, which shall not be the seller) shall take physical possession of such collateral or the Authority or the Trustee shall be named the record owner thereof in the records of the Federal Reserve Bank of New York and (C) be entered into only with (x) a bank or trust company organized under the laws of the State or the United States, which is a member of the Federal Reserve System and the Federal Deposit Insurance Corporation, having capital of not less than \$50,000,000 or (y) a government bond dealer reporting to, trading with and recognized as a primary dealer by, the Federal Reserve Bank of New York.

Obligations of the Trustee or any affiliate thereof may be Investment Securities, provided that they otherwise qualify.

UPON THE EFFECTIVE DATE OF THE TWENTY-SECOND SUPPLEMENTAL RESOLUTION, THE DEFINITION OF INVESTMENT SECURITIES WILL BE AMENDED TO READ AS FOLLOWS:

*Investment Securities* shall mean and include any of the following securities, if and to the extent the same are at the time legal investments by the Authority of the funds to be invested therein and conform to the policies set forth in any investment guidelines adopted by the Authority and in effect at the time of the making of such investment:

(i) direct obligations of, or obligations guaranteed as to principal and interest by, the State or direct obligations of any agency or public authority thereof, provided such obligations are rated, at the time of purchase, in one of the two highest rating categories by a Rating Agency;

(ii) (A) any bonds or other obligations which as to principal and interest constitute direct obligations of, or are guaranteed by the United States of America, including obligations of any agency thereof or corporation which has been or may hereafter be created pursuant to an Act of Congress as an agency or instrumentality of the United States of America to the extent unconditionally guaranteed by the United States of America or (B) any other receipt, certificate or other evidence of an ownership interest in obligations or in specified portions thereof (which may consist of specified portions of the interest thereon) of the character described in subclause (A) of this clause (ii);

(iii) obligations of any agency, subdivision, department, division or instrumentality of the United States of America; or obligations fully guaranteed as to interest and principal by any agency, subdivision, department, division or instrumentality of the United States of America;

(iv) banker's acceptances or certificates of deposit issued by a commercial bank with its principal place of business within the State and having capital and surplus of more than \$100,000,000;

(v) corporate securities, including commercial paper and fixed income obligations, which are, at the time of purchase, rated by a Rating Agency in its highest rating category for comparable types of obligations;

(vi) Repurchase agreements collateralized by securities described in clauses (ii) or (iii) above with any registered broker/dealer or with any domestic commercial bank whose long-term debt obligations are rated "investment grade" by each Rating Agency then maintaining a rating on the Bonds, provided that (1) a



specific written repurchase agreement governs the transaction, (2) the securities are held, free and clear of any lien, by the Trustee or an independent third party acting solely as agent for the Trustee, and such third party is (a) a Federal Reserve Bank, or (b) a bank which is a member of the Federal Deposit Insurance Corporation and which has combined capital, surplus and undivided profits of not less than \$25 million, and the Trustee shall have received written confirmation from such third party that it holds such securities, free and clear of any lien, as agent for the Trustee, (3) the repurchase agreement has a term of thirty days or less, or the Trustee will value the collateral securities no less frequently than monthly and will liquidate the collateral securities if any deficiency in the required collateral percentage is not restored within five business days of such valuation, and (4) the fair market value of the collateral securities in relation to the amount of the repurchase obligation, including principal and interest, is equal to at least 102%;

(vii) investment agreements or guaranteed investment contracts with any financial institution whose senior long term debt obligations, or whose obligations under such an investment agreement or guaranteed investment contract, are guaranteed by a financial institution whose senior long term debt obligations, have a rating (at the time such agreement or contract is entered into) in one of the two highest rating categories for comparable types of obligations by each Rating Agency then maintaining a rating on the Bonds;

(viii) money market funds rated in the highest rating category for comparable types of obligations by each Rating Agency then maintaining a rating on the Bonds; and

(ix) municipal obligations, the payment of principal and redemption price, if any, and interest on which is irrevocably secured by obligations of the type referred to in clauses (i), (ii) or (iii) above and which obligations have been deposited in an escrow arrangement which is irrevocably pledged to the payment of such municipal obligations and which municipal obligations are rated in the highest rating category for comparable types of obligations by each Rating Agency then maintaining a rating on the Bonds.

**Leased Property:** The real and personal property and other rights therein leased by the City to the Board pursuant to Article II of the Lease.

**Local Water Fund:** The special trust fund by that name established by the Act in the custody of the Board into which all Revenues are required to be deposited promptly upon receipt thereof by the Board.

**Minimum Monthly Balance:** For each Series of Bonds Outstanding, the monthly amount calculated in accordance with Section 4.3(a) of the Agreement. See "Summary of Certain Documents—Summary of the Agreement—Minimum Monthly Balance" in this Appendix C.

**O&M Reserve Fund Requirement:** For each Fiscal Year, the amount equal to one-sixth (1/6) of the Operating Expenses as set forth in the Annual Budget.

**Operating Expenses:** All reasonable or necessary current expenses of maintaining, repairing, operating and managing the System net of governmental operating aid, including: all salaries; administrative, general, commercial, architectural, engineering, advertising, public notice, auditing, billing, collection, enforcement and legal expenses; insurance and surety bond premiums; consultants' fees; payments to pension, retirement, health and hospitalization funds; taxes; payments in lieu of taxes; costs of public hearings; ordinary and current rentals of equipment or other property; hydrant rentals; lease payments for real property or interests therein (excluding certain amounts paid by the Board to the City pursuant to the Lease); depository expenses; reasonable reserves for maintenance and repair and all other expenses necessary, incidental or convenient for the efficient operation of the System; but only to the extent properly attributable to the Board or the System and payable by the Board to the City pursuant to the Lease and, except for certain administrative expenses of the Board, payable by the Board to the City pursuant to the Lease.

**Option Bonds:** Bonds which by their terms may be tendered by and at the option of the owner thereof for payment by the Authority prior to the stated maturity thereof, or the maturities of which may be extended by and at the option of the owner thereof.

**Outstanding:** As of any date, all Bonds theretofore or thereupon being authenticated and delivered under the Resolution except:

(a) any Bonds canceled by the Trustee at or prior to such date;

(b) any Bond (or portion thereof) for the payment or redemption of which there shall be set aside and held in trust under the Resolution either:

(i) moneys in an amount sufficient to pay when due the Principal Installments or Redemption Price thereof, together with all accrued interest,

(ii) Defeasance Obligations in such principal amounts, of such maturities, bearing such interest and otherwise having such terms and qualifications, as are necessary to provide moneys (whether as principal or interest) in an amount sufficient to pay when due the Principal Installments or Redemption Price thereof, together with all accrued interest, or

(iii) any combination of (i) and (ii) above,

and, if such Bond or portion thereof is to be redeemed, for which notice of redemption has been given as provided in Article VI of the Resolution or provision satisfactory to the Trustee has been made for the giving of such notice;

(c) any Bond in lieu of or in substitution for which other Bonds have been authenticated and delivered; and

(d) any Bond deemed to have been paid as provided in Section 1201(b) of the Resolution.

**Parity Bond Anticipation Notes:** Bond Anticipation Notes the interest on which is payable from and secured by a pledge of, and a lien on, a parity with all other Bonds.

**Permitted Encumbrances:** When used with reference to the System, (i) any and all liens, encumbrances, security interests or other defects in or clouds on title existing on the Effective Date, (ii) the Lease, (iii) easements, rights of way and exceptions which do not materially impair the operation or maintenance of the Leased Property or the Revenues therefrom, (iv) mechanics', materialmen's, warehousemen's and other similar liens, as permitted by law and liens for taxes at the time not delinquent or being contested and (v) agreements for the sale and leaseback of elements of the System.

**Principal Installment:** As of any date of calculation and with respect to any Series, so long as any Bonds thereof are Outstanding, (i) the principal amount of Bonds (including (x) any amount designated in, or determined pursuant to, the applicable Supplemental Resolution, as the "principal amount" with respect to any Bonds which do not pay full current interest for all or any part of their term) (y) the Tender Option Price of any Option Bonds which may be tendered for purchase or payment prior to the stated maturity thereof in accordance with the terms of the Supplemental Resolution authorizing such Option Bonds, unless such amount is secured by a Credit Facility which is not in default and (z) the principal amount of any Parity Reimbursement Obligations of such Series due (or so tendered for payment) on a certain future date for which no Sinking Fund Installments have been established, or (ii) the unsatisfied balance of any Sinking Fund Installments due on a certain future date for Bonds of such Series, or (iii) if such future dates coincide as to different Bonds of such Series, the sum of such principal amount of Bonds and of such unsatisfied balance of Sinking Fund Installments due on such future date. "Principal Installment" does not include the principal of Parity Bond Anticipation Notes.

**Project Financing Agreement:** Any Project Financing Agreement to be entered into among the Authority, the City, DEC and EFC pursuant to the State Revolving Fund Act.

**Projected Debt Service:** For any Fiscal Year or part thereof means, as of any date of calculation and with respect to any Projected Series of Bonds, an amount, certified by the Authority to the Trustee and the Board,

as provided in the Agreement, equal to the Debt Service estimated by the Authority to be payable during such Fiscal Year on such Projected Series.

**Projected Series of Bonds:** Any Series of Bonds described in an Authority Budget as anticipated to be issued in the Fiscal Year to which such Authority Budget relates.

**Rate Consultant:** The independent accountant or firm of independent accountants, or a management consultant or firm of management consultants, or independent engineer or firm of independent engineers, having, in any case, a recognized standing in the field of water and sewer system consulting selected by the Authority and satisfactory to the Board. The Rate Consultant may be the same firm as the Consulting Engineer.

**Rating Agencies:** Moody's Investors Service and Standard & Poor's Ratings Group and their respective successors and assigns.

**Redemption Price:** When used with respect to a Bond or portion thereof, the principal amount thereof plus the applicable premium, if any, payable upon either optional or mandatory redemption thereof pursuant to the Resolution.

**Refundable Principal Installment:** Any Principal Installment for any Series of Bonds which the Authority intends to pay with moneys which are not Revenues, provided that such intent shall have been expressed in the Supplemental Resolution authorizing such Series of Bonds and provided further that such Principal Installment shall be a Refundable Principal Installment only through the date of the Authority Budget adopted during the Fiscal Year immediately preceding the Fiscal Year in which such Principal Installment comes due unless the Authority has delivered to the Trustee a certificate of an Authorized Representative that it has made provision for the payment of such Principal Installment from a source other than Revenues.

**Refunding Bond:** Any Bond authenticated and delivered on original issuance pursuant to Section 206 or Section 207 of the Resolution for the purpose of refunding any Outstanding Bonds or thereafter authenticated and delivered in lieu of or substitution for such Bond pursuant to the Resolution.

**Reimbursement Obligation:** The obligation of the Authority described in the Resolution to directly reimburse the issuer of a Credit Facility for amounts paid by such issuer thereunder, whether or not such obligation to so reimburse is evidenced by a promissory note or other similar instrument.

**Required Deposits:** For any Fiscal Year, amounts, if any, payable into the Authority Expense Fund, the Debt Service Reserve Fund and the Subordinated Indebtedness Fund but only to the extent such payments are required to be made from Revenues pursuant to the Resolution.

**Revenues:** (a) All the rents, fees, charges, payments and other income and receipts derived by the Board from users of the System, and (b) investment proceeds and proceeds of insurance received by the Board (other than the proceeds of insurance with respect to the damage or destruction of all or any portion of the System), together with all operating aid therefor from any governmental entity, Federal, State or local, to the Board, but shall not include (w) amounts required to be refunded because of billing or payment errors, (x) any amount attributable to any of the foregoing sources described in clause (a) which (i) is expressly excluded by the Agreement or the Lease, or (ii) is derived from a use of the System not directly related to the supply, treatment and distribution of water to the consumers thereof or the collection, disposal or treatment of sewage, (y) any amount from any governmental entity, Federal, State or local, in aid of or for or with respect to the Costs of Water Projects or (z)(i) fines (excluding interest on late payments which shall constitute Revenues), (ii) amounts from the use of water to generate electricity, (iii) amounts from the State as a result of mandatory water discharges from reservoirs or (iv) amounts from the granting of easements, licenses, rights-of-way or other interests in the real property constituting a part of the System.

UPON THE EFFECTIVE DATE OF THE TWENTY-SECOND SUPPLEMENTAL RESOLUTION, THE DEFINITION OF REVENUES WILL BE AMENDED TO READ AS FOLLOWS:

**Revenues** shall mean (a) all the rents, fees, charges, payments and other income and receipts derived by the Board from users of the System, together with all operating aid therefor from any governmental entity, Federal, State or local, to the Board, (b) investment proceeds and proceeds of insurance received by the Board (other than the proceeds of insurance with respect to the damage or destruction of all or any portion of the System), (c) Subsidy Payments derived by the Authority, (d) amounts derived by the Authority from a Counterparty pursuant to an Interest Rate Exchange Agreement, and (e) investment proceeds derived from amounts on deposit in the Funds and Accounts established hereunder that are deposited or retained in the Revenue Fund or the Local Water Fund, and but shall not include (w) amounts required to be refunded because of billing or payment errors, (x) any amount attributable to any of the foregoing sources described in clause (a) which (i) is expressly excluded by the Agreement or the Lease, or (ii) is derived from a use of the System not directly related to the supply, treatment and distribution of water to the consumers thereof or the collection, disposal or treatment of sewage, (y) any amount from any governmental entity, Federal, State or local, in aid of or for or with respect to the Costs of Water Projects, other than Subsidy Payments, or (z)(i) fines (excluding interest on late payments which shall constitute Revenues), (ii) amounts from the use of water to generate electricity, (iii) amounts from the State as a result of mandatory water discharges from reservoirs or (iv) amounts from the granting of easements, licenses, rights-of-way or other interests in the real property constituting a part of the System.

**Special Credit Facility:** With respect to any Series of Bonds or portion thereof, a Credit Facility (a) which provides funds for (i) the direct payment of the Principal Installments of and interest on such Bonds when due or (ii) the payment of the Principal Installments of and interest on such Bonds in the event amounts otherwise pledged to the payment thereof are not available when due or (iii) the payment of the Tender Option Price of any Option Bond which may be tendered to the Authority for purchase or payment in accordance with the Supplemental Resolution authorizing such Option Bond (in any case, regardless of whether such Credit Facility provides funds for any other purpose) and (b) which (i) requires the Authority to directly reimburse the issuer of such Credit Facility for amounts paid thereunder and (ii) provides that such obligation is a Parity Reimbursement Obligation.

**State:** The State of New York.

**State Revolving Fund:** The New York State Water Pollution Control Revolving Fund established pursuant to the State Revolving Fund Act.

**State Revolving Fund Act:** Chapter 565 of the laws of New York of 1989, as amended.

**Subordinated Indebtedness:** Any bond, note or other evidence issued by the Authority in furtherance of its corporate purposes under the Act and payable from the Subordinated Indebtedness Fund.

UPON THE EFFECTIVE DATE OF THE TWENTY-SECOND SUPPLEMENTAL RESOLUTION, THE FOLLOWING DEFINITION WILL BE ADDED TO THE GENERAL RESOLUTION:

**Subsidy Payments** shall mean amounts payable to the Authority from any governmental entity, Federal, State or local, in connection with Bonds of the Authority.

**Supplemental Resolution:** A resolution of the Authority authorizing the issuance of a Series of Bonds or otherwise amending or supplementing the Resolution.

**System:** The Water System and the Sewerage System, collectively, as such terms are defined in the Act.

**Tender Option Price:** With respect to any Option Bond tendered for purchase or payment, an amount equal to the principal amount thereof plus interest accrued and unpaid thereon from the immediately preceding Bond Payment Date to the date of such tender.

**Trustee:** The trustee appointed by the Authority pursuant to the General Resolution, and any successors thereto.

**Variable Rate Bond:** As of any date of determination, any Bond on which the interest rate borne thereby may vary during any part of its remaining term.

**Water Project:** Any sewerage facility, water facility or water and sewerage facility, as the case may be, including the planning, development, financing or construction thereof.

### **Summary of Certain Documents**

The following are brief summaries of certain provisions of the Agreement, the Lease and the General Resolution. These summaries do not purport to be complete and are subject in all respects to the provisions of, and are qualified in their entirety by, reference to the respective documents to which they relate.

### **Summary of the Agreement**

**Financing of Water Projects.** The Authority agrees to use its best efforts to finance all or a part of the Cost of all Water Projects described in Appendix A to the Agreement. In consideration for the Authority's issuance of the Bonds, the Board gives, grants, conveys and transfers to the Authority all of its right, title and interest in the Revenues, including without limitation, all of its rights to collect and receive said Revenues subject only to provisions of the Act, the Agreement and the Resolution permitting the application of said Revenues to the purposes therein set forth. The Board itself incurs no indebtedness under the terms of the Agreement, Lease, Resolution or any other document executed in connection therewith. (*Sections 2.1, 2.2 and 2.4*)

**Transfer of Funds.** The Authority shall deposit the proceeds of each Series of Bonds with the Trustee in accordance with the provisions of the Resolution and the Supplemental Resolution authorizing such Series; provided, however, that the portion of the proceeds designated to pay the Costs of any Water Project shall be held only in the Construction Fund established pursuant to the Resolution.

The Authority shall authorize payment of such Costs in the manner set forth in the Resolution once evidence thereof is provided in a Certificate signed by an Authorized Representative of the Board or City, as the case may be. Neither the Authority nor the Trustee shall be required to provide funds to pay the Costs of Water Projects from any source other than the Construction Fund, and neither the Authority nor the Trustee shall pay to the City from such Fund any amount in excess of that set aside for the purposes thereof, or for the Projects listed in Appendix A to the Agreement. (*Sections 3.1 and 3.2*)

**Local Water Fund.** The Board shall deposit all Revenues, as promptly as practicable after receipt, into the Local Water Fund. There shall also be deposited in the Local Water Fund all amounts received by the Board from the Trustee pursuant to the Resolution. (*Section 4.1*)

**Establishment of Certain Funds and Application of Revenues in Local Water Fund.** The Board shall establish two special funds (in addition to the Local Water Fund) to be held by the Board at a Depository: the Board Expense Fund and the Operation and Maintenance Reserve Fund, with the General Account therein. The Board shall hold such funds as trust funds and the amounts on deposit shall only be applied for the purposes provided in the Agreement.

Beginning on the first day of each month in each Fiscal Year, the Board is required to apply the Revenues in the Local Water Fund, *first*, to the Trustee for deposit in the Revenue Fund until the amount on deposit in the Revenue Fund equals the Minimum Monthly Balance for such month and the Trustee shall have received the amounts, if any, required to be deposited in the Authority Expense Fund, the Debt Service Reserve Fund and the Subordinated Indebtedness Fund for such month. Thereafter, in such month from the balance remaining in the Local Water Fund, the Board is required, after making provision for Board Expenses, to pay to the City 1/12th of the operating expenses for such Fiscal Year. After making such payments, any amounts remaining in the Local

Water Fund in each month are applied daily (i) to satisfy the Cash Flow Requirement (if the required payments to the City for Operating Expenses have been made), (ii) to satisfy required payments to the City for Operating Expenses (if the Cash Flow Requirement has been satisfied) or (iii) proportionately, to the Trustee for deposit in the Revenue Fund and to the City for the payment of Operating Expenses, until the total of all amounts deposited in the Revenue Fund during such Fiscal Year equals the Cash Flow Requirement and all Operating Expenses required to be paid shall have been paid. Thereafter, as long as the amount on deposit in the Revenue Fund in each month is equal to the Minimum Monthly Balance and the Cash Flow Requirement continues to be met, all such amounts in the Local Water Fund shall be paid as follows: *first*, to the Authority until the total of the amounts so paid equals the principal of and interest on any bonds, notes or other obligations of the Authority (other than Bonds, Bond Anticipation Notes, and Subordinated Indebtedness) payable within the then current Fiscal Year, together with all other amounts necessary to make the required deposits to the reserve and other funds and amounts established for such bonds, notes or other obligations; *second*, to the City until the amounts so paid are equal to the rental payment for such Fiscal Year and the unsatisfied balance, if any, of the rental payment for any prior Fiscal Year; and, *third*, to the Operation and Maintenance Reserve Fund, until the amount therein on deposit is equal to the O&M Reserve Requirement for such Fiscal Year. Any amounts remaining in the Local Water Fund on the last day of each Fiscal Year shall be paid to the General Account in the Operation and Maintenance Reserve Fund. (Section 4.2)

**Minimum Monthly Balance.** The Minimum Monthly Balance shall be calculated as of the first day of the month and shall be equal to the sum of:

(i) For each Series of Bonds which is Outstanding during the current Fiscal Year, an amount equal to the product obtained by multiplying (a) the difference between (1) the amount of interest due or projected to be due on the next succeeding Bond Payment Date for such and (2) the amount, if any, held in the applicable subaccount for such Series in the Capitalized Interest Account in the Debt Service Fund by (b) a fraction, the numerator of which is the number of full months since the end of the month preceding the last Bond Payment Date for such Series (or, with respect to the first Bond Payment Date for such Series, the number of full months since the last day of the month preceding the date of issuance of such Series) and the denominator of which is the number of months between Bond Payment Dates minus one (or, with respect to the first Bond Payment Date for a Series, the number of months between the last day of the month preceding the date of issuance of such Series and the first Bond Payment Date minus one); provided, however, that if this formula would produce (A) a fraction greater than one, then the fraction shall be equal to one, or (B) a denominator less than one, then the fraction shall be equal to one; plus

(ii) For each Series of Bonds which is Outstanding during the current Fiscal Year, an amount equal to the Principal Installment due or projected to be due on the next succeeding Bond Payment Date for such Series which falls within twelve months or less on which a Principal Installment is due, multiplied by a fraction, the numerator of which is the number of full months since the last day of the month preceding the last Bond Payment Date on which a Principal Installment was due (or, with respect to the first such Bond Payment Date, twelve minus the number of full months to the first Bond Payment Date on which a Principal Installment is due), and the denominator of which is eleven; provided, however, that if this formula would produce a fraction greater than one, then the fraction shall be equal to one. (Section 4.3)

**Deposits to Operation and Maintenance Reserve Fund.** There shall be deposited to the Operation and Maintenance Reserve Fund in each Fiscal Year from the sources described below the amount required, if any, so that the amounts on deposit therein satisfy the O&M Reserve Fund Requirement for the ensuing Fiscal Year.

Deposits to the Operation and Maintenance Reserve Fund may be made from the proceeds of the sale of Bonds of the Authority, from the Local Water Fund, or from any other moneys lawfully available therefor, subject to the following limitations:

(i) The maximum deposit to the Operation and Maintenance Reserve Fund from the proceeds of Bonds of the Authority, as of any time of calculation, may not exceed the O&M Reserve Fund Requirement then in effect, reduced by the cumulative sum of prior deposits thereto from proceeds of Bonds of the Authority.

(ii) Deposits to the Operation and Maintenance Reserve Fund from the Local Water Fund shall be subject to the priorities established in Section 4.2 of the Agreement.

(iii) If there shall be a deficit in the Operation and Maintenance Reserve Fund on May 1 of any Fiscal Year, and if as of such May 1 the Board does not project that available Revenues will at least equal the O&M Reserve Requirement for such Fiscal Year by June 30 of such Fiscal Year, then the Board shall include in its Annual Budget for the ensuing Fiscal Year an amount sufficient, together with other amounts available therefor, to at least equal the O&M Reserve Fund Requirement for the ensuing Fiscal Year.

If on July 1 of any Fiscal Year the amount on deposit in the Operation and Maintenance Reserve Fund is less than the O&M Reserve Fund Requirement, such deficit shall (subject to paragraph (i) above) be made up from the proceeds of the sale of Bonds issued during such Fiscal Year; provided, however, if, prior to May 1 of such Fiscal Year such deficit has not been made up from Bond proceeds, the Board shall include the amount of such deficit in its Annual Budget for the ensuing Fiscal Year and the amounts necessary to restore such deficit shall be deposited in the Operation and Maintenance Reserve Fund.

Amounts required to be deposited in the General Account shall be held separate and apart from other amounts held in the Operation and Maintenance Reserve Fund and applied as described below. (*Section 4.4*)

**Application of Moneys in the Operation and Maintenance Reserve Fund.** If on the first day of any month the Board has not paid to the City an amount equal to the product of (i) the amount required to be paid for Operating Expenses pursuant to Section 8.1 of the Lease, multiplied by (ii) a fraction the numerator of which is the number of months which have commenced during such Fiscal Year, and the denominator of which is 12, the Board shall withdraw from the Operation and Maintenance Reserve Fund and pay to the City, on demand, an amount equal to  $\frac{1}{12}$  of the amount so required to be paid pursuant to Section 8.1 of the Lease, or the entire balance in such Fund if less than sufficient. Amounts on deposit in the General Account may be applied to purposes provided for in Section 4.2 or to the Costs of Water Projects, but shall be retained therein to the extent required by the Annual Budget. (*Section 4.5*)

UPON THE EFFECTIVE DATE OF THE AMENDMENT TO THE AGREEMENT, AMOUNTS ON DEPOSIT IN THE GENERAL ACCOUNT ALSO MAY BE APPLIED TO THE PAYMENT OF BONDS IN ACCORDANCE WITH ARTICLE XII OF THE RESOLUTION.

**Application of Moneys in Board Expense Fund.** Amounts on deposit in the Board Expense Fund shall be applied by the Board solely for the purposes of paying expenses of the Board, in accordance with the Annual Budget. (*Section 4.6*)

**Application of Revenues After Default.** The Board has covenanted that if an "event of default" (as defined in the Resolution) shall occur, the Board shall pay or cause to be paid to the Trustee, upon its request, all moneys and securities then held by the Board in the Local Water Fund and thereafter the Revenues as promptly as practicable after receipt. (*Section 4.7*)

**Amounts Remaining.** Any amounts received or held by the Authority or the Trustee pursuant to the Resolution, any similar document or the Agreement after all Bonds and other evidences of indebtedness have been paid in full or are no longer Outstanding and after payment of all other obligations and expenses of the Authority, or provision for payment thereof has been made, shall be paid to the City.

Any payments by the City to the Water Board pursuant to Section 1045-h(3) of the Act shall be confined to consideration for the sale of goods or the rendering of services by the Water Board to the City pursuant to the Lease or the Agreement as contemplated by the Act. (*Section 4.8*)

**Rate Covenant.** The Board has covenanted and agreed to establish, fix and revise fees, rates or other charges for the use of or services furnished by the System which, together with any other available funds, are adequate to provide for (i) the timely payment of the Principal Installments of and interest on all Bonds and the

principal of and interest on any other indebtedness of the Authority payable from Revenues. (ii) the proper operation and maintenance of the System, (iii) all other payments required for the System not otherwise provided for and (iv) all other payments required pursuant to the Agreement and the Lease, without intending to limit the generality of the foregoing, the Board has also covenanted to establish and collect rates, fees and charges sufficient in each Fiscal Year so that Revenues collected in such Fiscal Year will be at least equal to the sum of (i) 115% of estimated Aggregate Debt Service and Projected Debt Service payable in such Fiscal Year (excluding any Refundable Principal Installment if payable from funds held in trust therefor and assuming with respect to Variable Rate Bonds that the effective rate of interest is that which the Authority determines so long as such rate is not less than the rate such Bonds bear at the time Aggregate Debt Service is determined), (ii) 100% of the Operating Expenses and Authority Expenses payable in such Fiscal Year and (iii) 100% of the amount necessary to pay the other Required Deposits for such Fiscal Year. However, a failure to generate such Revenues does not constitute an "event of default" if the Board takes timely action to correct any such deficit. The Board shall review, at least annually, such rates, fees and charges to determine whether such rates, fees and charges are, or will be, sufficient to meet the requirements thereof and shall promptly take action to cure or avoid any deficiency. Except to the extent required by Section 1045-j of the Act, as in effect on July 24, 1984, with regard to the requirement that tax exempt organizations be charged for service provided by the System or by existing agreements (including any successor agreements with Jamaica), the Board will not furnish or supply any product, use or service of the System free of charge or at a nominal charge. (*Section 6.1*)

**Consulting Engineer and Rate Consultant.** The Authority shall employ a Consulting Engineer and a Rate Consultant whose duties, respectively, shall be to make any certificates and perform any other acts required or permitted of the Consulting Engineer and the Rate Consultant under the Agreement and the Resolution. If so determined by the Authority, the same person or firm may perform the duties and functions of the Consulting Engineer and Rate Consultant.

In each Fiscal Year, the Consulting Engineer and the Rate Consultant shall make an examination of, and shall report to the Authority, the Board, the City and the Trustee, on the properties and operations of the System. The report of the Rate Consultant shall set forth among other findings, the Rate Consultant's recommendation as to any necessary or advisable revisions of rates, fees and charges for the ensuing Fiscal Year and such other advice and recommendation as it may deem desirable. The Consulting Engineer's report shall set forth its findings as to whether the System has been maintained in good repair and sound operating condition, and its estimate of the amount, if any, required to be expended to place such properties in such condition and the details of such expenditures and the approximate time required therefor. The City covenants that if any such report of the Consulting Engineer shall set forth that the properties of the System have not been maintained in good repair and sound operating condition, it will promptly restore the properties to good repair and sound operating condition with all expedition practicable. (*Section 6.2*)

**Covenant to Operate and Maintain System.** The City has covenanted that it shall, at all times:

(a) in accordance with the advice and recommendations of the Consulting Engineer, operate the System properly and in a sound and economical manner and maintain, preserve, and keep the same preserved and kept with the appurtenances and every part and parcel thereof, in good repair, working order and condition, and from time to time make, or cause to be made, all necessary and proper repairs, replacements and renewals so that at all times the operation of the System may be properly and advantageously conducted, regardless of any failure on the part of the Board to make the payments to the City required by Section 3.1 of the Lease; provided, however, that nothing contained in the Agreement shall require the City to operate, maintain, preserve, repair, replace, renew or reconstruct any part of the System if there shall be filed with the Board, the Authority and the Trustee (i) a certificate of the Commissioner acting as the Authorized Representative of the City stating that in the opinion of the City abandonment of operation of such part of the System will not adversely affect the operation of the System or the amount of Revenues derived therefrom and is not prejudicial to the interests of the Board, the Authority or the Bondholders and (ii) a Certificate of the Consulting Engineer concurring with such statement;



(b) enforce the rules and regulations governing the operation, use and services of the System established from time to time by the Board or the City;

(c) observe and perform all of the terms and conditions contained in the Act, and comply with all valid acts, rules, regulations, orders and directions of any legislative, executive, administrative or judicial body having competent jurisdiction of the City or the System; provided, however, that the failure of the City to comply with the covenant contained in this subsection (c) for any period shall not constitute a default on its part so long as the City (i) is taking reasonable and timely steps to permit compliance and (ii) the City shall have delivered to the Board and to the Authority a Certificate of the Consulting Engineer which (1) sets forth in reasonable detail the facts and circumstances attendant to such non-compliance, (2) sets forth the steps being taken by the City to permit compliance, (3) sets forth the estimated date on which the City will be in compliance and (4) states that in the opinion of the Consulting Engineer such non-compliance during the period described will not adversely affect the operation of the System or the amount of Revenues to be derived therefrom; and

(d) not create or suffer to be created any lien or charge upon the System or any part thereof except for Permitted Encumbrances. (*Section 6.3*)

**Annual Budget.** On May 1 of each year (or on such later date as the Authority, the Board and the City may agree) the Authority shall deliver to the Board a certified copy of the Authority Budget for the ensuing Fiscal Year showing the Cash Flow Requirement for such Fiscal Year. Based upon the information contained in (a) the Authority Budget, (b) the City's certification pursuant to Section 8.3 of the Lease and (c) the Certificate of the Consulting Engineer delivered to the Board pursuant to Section 8.3 of the Lease (collectively, the "Budget Documents"), the Board shall prepare the Annual Budget for the ensuing Fiscal Year. In addition to the information contained in the Budget Documents the Board shall also make provision in the Annual Budget for Board Expenses for the ensuing Fiscal Year, for the amount, if any, required to be deposited in the Operation and Maintenance Reserve Fund in accordance with Section 4.4 of the Agreement, and for the application of the amounts in the General Account therein. Thereafter, but in no event later than 15 days after the date of publication of the Executive Budget of the City, the Board shall adopt such Annual Budget. Promptly after adoption of the Annual Budget, and in no event later than June 10 (or such other date as the Authority, the Board and the City may agree) of each year, the Board shall establish the rates, fees and charges for the use of the System for the ensuing Fiscal Year. The Board may from time to time, either before or after commencement of the Fiscal Year to which it relates, amend the Annual Budget, but (except for its own expenses) only in accordance with and after receipt of amended Budget Documents. If as of the first day of any Fiscal Year an Annual Budget has not been adopted, the Annual Budget for the immediately preceding Fiscal Year shall be the Annual Budget for such Fiscal Year until a new Annual Budget is adopted. (*Section 6.4*)

**Tax Exemption.** The City, the Authority and the Board have covenanted that so long as any Bonds shall be Outstanding, no one will take any action, nor fail to take any action, which, if taken or not taken, as the case may be, would adversely affect the tax-exempt status of the interest payable on the Bonds then Outstanding the interest on which is excluded from gross income under the Internal Revenue Code of 1986, as amended. (*Section 6.5(b)*)

**Discontinuance of Service.** The Board has covenanted to enforce or cause the City to enforce the rules and regulations providing for discontinuance of, or disconnection from, the supply of water or the provision of sewer service, or both, as the case may be, for non-payment of fees, rents, rates or other charges imposed by the Board, provided that such discontinuance or disconnection shall not be carried out except in the manner and upon the notice as is required of a waterworks corporation pursuant to Sections 89(b)(3)(a)-(c) and 116 of the Public Service Law of the State. (*Section 6.7*)

**Covenant of City as to Rates and Charges.** The City has covenanted that, upon the issuance of the Bonds by the Authority, the City will not thereafter levy user fees, rents and other charges with respect to the System until all Bonds are paid or are no longer Outstanding pursuant to the terms of the Resolution; provided, however, that the City may levy ad valorem taxes to pay the costs and expenses of the System or to pay the

principal of and interest on general obligation bonds of the City heretofore or hereafter issued to finance the System or any part thereof. *(Section 6.9)*

**Books and Records.** Each of the Authority and the Board shall keep or cause to be kept proper books of record and account in which complete and correct entries shall be made of all transactions relating to their corporate purposes under the Act. In accordance with Section 1045-y of the Act, the Authority and the Board shall annually submit to the Mayor, the Comptroller and the Director of Management and Budget of the City a detailed report concerning their activities for the Fiscal Year. In addition, the Authority and the Board shall submit to the Mayor, the Comptroller and the Director of Management and Budget of the City audited annual financial statements of the Authority and the Board together with a report thereon of an accountant satisfactory to the Board. *(Section 6.11)*

**Liens.** Until the Bonds or other evidences of indebtedness issued by the Authority for its purposes under the Act have been paid in full or provision has been made therefor in accordance with the Resolution or similar document, the Agreement provides that the Board shall not create, and, to the extent it has the power to do so, shall not permit to be created, any lien upon or pledge of the Revenues except the lien and pledge thereon created by the Act. *(Section 6.12)*

**Security Interests.** Except to the extent provided in the Act, neither the Board nor the Authority may grant any Bondholder any security interest in any of the assets or Properties of the Board. *(Section 6.13)*

**Financing through State Revolving Fund.** In connection with the financing of Water Projects by the Authority with funds provided from the State Revolving Fund, the City may enter into a Project Financing Agreement or Agreements among DEC, EFC and the Authority and make in any such agreement certain representations, warranties, covenants and agreements. *(Section 6.16)*

**Agreement of the State.** Under the provisions of the Agreement, the parties pledge and agree, for and on behalf of the State as provided in the Act, that the State will not alter or limit the rights vested by the Act in the Authority or the Board to fulfill the terms of any agreement made with or for the benefit of the Bondholders, or in any way impair the rights and remedies of Bondholders, until the Bonds, together with the interest thereon, interest on any unpaid installment of interest, and all costs and expenses incurred in any action or proceeding by or on behalf of such holders, are fully met and discharged. *(Section 7.1)*

**Events of Default and Remedies.** An "event of default" or a "default" means any one of the following events: (i) failure by the Board to pay the Authority those amounts required under the Agreement; (ii) failure of the City or the Board to observe any covenant, term or condition of the Agreement (other than the payments the Board shall make to the Authority) and such failure shall have continued for a period of sixty (60) days after written notice, specifying such failure and requesting that it be remedied, is given to the City or the Board, or both, by the Authority unless the Authority shall agree in writing to extend such time prior to its expiration, provided such extension shall not be unreasonably withheld if the City or the Board has instituted and is diligently pursuing corrective action which cannot be completed within the applicable period; (iii) the Authority shall file a petition, or otherwise seek relief, under any federal or State bankruptcy or similar law; and (iv) the terms, conditions and security provided under the Agreement and the Resolution or the respective provisions of the Act pursuant to which the Resolution has been adopted or the Bonds have been issued or entered into (including, without limitation, the provisions under which the lien upon the Revenues has been created pursuant to the Agreement and the Resolution and the provisions establishing the powers and obligations of the Board and the relationship of the Authority to the Board and the City) shall be materially and adversely limited, altered or impaired by any legislative action or any final judgment. *(Section 8.1)*

Whenever an event of default shall have occurred and be continuing, the Authority and the Trustee may take whatever legal action may appear necessary or desirable to: (i) collect the payments then due and as they thereafter become due and (ii) so long as any Bonds are Outstanding, enforce performance and observance of any obligation or covenant of the City or the Board under the Agreement. In addition, if the Board defaults in

making the payments to the Authority required under the Agreement as a result of its failure to impose sufficient fees, rates, rents or other charges, the Authority may petition for the appointment of a receiver to administer the affairs of the Board in order to achieve Revenues sufficient to make such payments by establishing fees, rates, rents or other charges at least sufficient therefor. The remedies conferred upon or reserved to the Authority in respect of any event of default are not exclusive of other available remedies, but shall be in addition to every other remedy given under the Agreement or existing at law or in equity or by statute. (*Sections 8.2 and 8.3*)

**Termination.** The Agreement shall terminate and the covenants and other obligations contained therein shall be discharged and satisfied, when (i) payment of all indebtedness of the Authority has been made or provided for in accordance with the Resolution or similar document securing such indebtedness and (ii) either all payments required thereunder have been made in full, or provision for such payments satisfactory to the Authority has been made, or the City pays or assumes all liabilities, obligations, duties, rights and powers of the Authority under the Agreement. (*Section 9.1*)

**Amendments.** The parties to the Agreement may enter into any amendment, change or modification of the Agreement (if in writing, signed by each of the parties and consented to in writing by the Trustee if required by the Resolution) including, without limitation, amendments to Appendix A to the Agreement; provided that the parties shall enter into no such change or modification which materially adversely affects the rights of the holders of any Bonds by modifying or revoking certain enumerated provisions of the Agreement without first complying with the applicable provisions of the Resolution. (*Section 10.1*)

**Conflicts.** The Agreement provides that its provisions shall not change or in any manner alter the terms of the Resolution, or the security, rights or remedies of the Trustee or the Bondholders. In the event any provision of the Agreement conflicts at any time, or in any manner, with the provisions of the Resolution or any Bond, the provisions of the Resolution or Bond shall be controlling and conflicting provisions of the Agreement shall be disregarded. (*Section 12.1*)

## **Summary of the Lease**

**Term of Lease and Demise of Leased Property.** The City has leased the Leased Property to the Board for the term of the Lease (the "Lease Term"). The Lease Term commenced on the Effective Date (July 1, 1985) and continues until the later of the 40th anniversary of the Effective Date or the date on which all bonds, notes or other obligations of the Authority are paid in full or provision for such payment is made pursuant to the resolution, trust indenture or other instrument under which such bonds, notes or other obligations are issued. During the Lease Term the Board may use the Leased Property only for its corporate purposes and upon the terms and conditions contained in the Lease.

The Leased Property includes (whether now in use or hereafter acquired, and whether or not located within the boundaries of the City) all of the City's right, title and interest in: (i) the City's sewerage system, including but not limited to all plants, structures, equipment and other real and personal property or rights therein acquired, rehabilitated or constructed (including all work in progress as soon as commenced) and used for the purpose of collecting, treating, pumping, neutralizing, storing and disposing of sewage, including, but not limited to, main, collecting, outlet or other sewers, pumping stations, groundwater recharge basins, backflow prevention devices, sludge dewatering facilities, vessels, barges, clarifiers, filters and phosphorous removal equipment, vehicles and other property used in connection with the sewer system; (ii) the City's water system, including but not limited to all plants, structures and other real and personal property or rights therein, acquired, rehabilitated or constructed (including all work in progress as soon as commenced) and used or to be used for the purpose of supplying, distributing, accumulating or treating water, including, but not limited to, reservoirs, basins, dams, canals, aqueducts, pipelines, mains, pumping stations, water distribution systems, intake systems, waterworks, sources of water supply, purification or filtration plants, water meters and rights of flowage or diversion, vehicles and other property used in connection with the water system; and (iii) any other materials, supplies, plans and property contained in the above-mentioned plants and structures incidental to, or necessary or useful and convenient for, the operation of such facilities; provided, however, that the Leased Property shall not include the

City's right, title and interest in the following: (i) any property or rights of the City the conveyance of which pursuant to the Lease would cause a reversion to or in favor of, or permit a reentry by or in favor of, any third party; (ii) all mines and minerals whatsoever (but not including surface or subsurface waters) now or hereafter found and discovered, crops and timber, on or under the lands to be conveyed pursuant to the Lease; with power and authority for the City to perform certain mineral extraction and agricultural/timber activities; provided, however, that the City shall not undertake any such activities which interfere with the operation, maintenance or collection of Revenues of the System. (*Section 2.1*)

**Right of City to Enter Leased Property.** The City retains the right to enter upon any portion of the Leased Property, to use any property not constituting a part thereof which is located in, across or upon the Leased Property or for any purpose unless, in the reasonable judgment of the Board, such entry or use would adversely affect the collection of Revenues. (*Section 2.2*)

**Substitution of Board for City.** Where necessary or desirable and to the extent permitted by law, the City and the Board agree to use their best efforts to substitute the Board for the City with respect to any application or proceedings filed or commenced in relation to the Leased Property with the various State and Federal regulatory bodies having jurisdiction. (*Section 2.5*)

**Indemnification.** The City agrees, to the extent permitted by law and subject to certain conditions, to hold the Board harmless from any and all liability, loss or damage from or in connection with any act the Board does or omits in the exercise of its powers if taken or omitted in good faith and in pursuance of its corporate purposes. (*Sections 3.1, 3.2 and 7.2*)

**Operation and Maintenance of the Leased Property.** The City shall administer and operate the Leased Property, maintain the Leased Property in good and safe order and condition and make all repairs therein. The City's duty to "maintain" and "repair" shall include all necessary repairs, replacements, renewals, alterations and additions, whether structural, non-structural, ordinary or extraordinary and its duty to "administer" shall include, without limitation, the enforcement of regulations of the Board and the City relating to the use of the System. However, the Lease shall not impose any obligation or liability upon the City for the administration, operation, maintenance and repair of the System not previously imposed upon it in connection with its prior operation and maintenance of the System. Both the Board and the City shall use all reasonable care to prevent the occurrence of waste, damage or injury to the Leased Property. The System shall be used and operated and maintained in accordance with all applicable laws, rules and regulations. (*Sections 4.1, 4.2 and 4.3*)

**Construction and Acquisition.** The Board authorizes the City to perform the construction and effectuation of any Water Project specified in the Agreement and the City may incur Costs in connection therewith. The City may acquire all real and personal property, or any interest therein, necessary or useful for the construction or effectuation of a Water Project; provided that all such property or interest acquired by the City through the exercise of the power of eminent domain shall be taken in the name of the City. (*Sections 5.1, 5.2 and 5.3*)

**Billing and the Levy of Water and Sewer Charges.** The City has agreed to provide billing services to the Board. Such services include but are not limited to: (i) notification to users of the System of the water and sewer charges levied by the Board, (ii) collection of such charges (including the City's use of its power of enforcement and collection of unpaid taxes under the laws of the State to enforce and collect any delinquent water and sewer charges from the persons and property liable therefor) and (iii) maintenance of the books, records and accounts of the billing systems. (*Sections 6.1 and 6.2*)

**Late Payments.** All late payments of water and sewer charges are the property of the Board and shall be collected by the City on behalf of the Board. Notwithstanding the foregoing, the Board has assigned to the City all of its rights and interest in and to all outstanding charges levied and uncollected on all properties at the time title thereto is vested in the City pursuant to *in rem* proceedings in consideration for the City's payment to the Board, in each Fiscal Year after the Effective Date, of an amount equal to 2% of such outstanding charges

(unless, during the Lease Term, the City and the Board mutually agree on a different procedure for allocating such outstanding charges). (Section 6.3)

**Discontinuance of Billing Services.** If either the City or the Board no longer desires that the City provide the Board with billing services, the party desiring termination shall give written notice of such fact to the other party at least two years prior to the termination. Notwithstanding such termination of billing services, Section 6.2 of the Lease shall remain in full force and effect. (Section 6.4)

**Legal Services.** The Board has hired the City's Law Department to provide it with legal services. However, the Board may hire a different attorney or firm of attorneys to provide it with legal services. If the Board retains counsel to defend a claim against it without the prior approval of EFC Counsel of the City (which approval shall not be unreasonably withheld), the Board shall not be entitled to the indemnification from the City provided in Article III of the Lease with respect to such claim, unless the City elects in writing to provide such indemnification. (Sections 7.1 and 7.2)

**Payments of Costs by the Board.** The Board has agreed to pay to the City amounts sufficient to: (i) pay the cost of administration, maintenance, repair and operation of the Leased Property, including overhead costs incurred by the City attributable to the Leased Property (but less the amount of any governmental operating aid received or receivable within the current Fiscal Year with respect to the System), the cost of materials and supplies, and the amount of any judgment or settlement paid by the City arising out of a tort claim (but only if the costs of such claim are not otherwise reimbursed, the City's liability for such claim is related to Construction of a Water Project or operation or maintenance of the System and the costs of such claims do not exceed for any Fiscal Year 5% of the aggregate revenues shown on the Board's last year-end audited financial statements); (ii) reimburse the City for capital Costs incurred by the City in the Construction of Water Projects (if requested by the City and not otherwise reimbursed) including, without limitation, the payment of any judgment or settlement arising out of a contract claim related to the Construction of any Water Project; (iii) pay the cost of billing and collection services provided by the City; (iv) pay the cost of legal services provided by the City; and (v) reimburse the City for the compensation, or the costs of the services, of any City officers and employees provided on a full-time or part-time basis to the Board. (Section 8.1)

**Base Rental Payments.** In addition, the Board shall pay the City a rental payment for the System, but only to the extent requested by the City, and not to exceed the greater of (i) the principal and interest payable on general obligation bonds issued by the City for water and sewer purposes and certified by the City to be paid within such Fiscal Year, or (ii) 15% of the amount of principal and interest payable on the Bonds of the Authority and certified by the Authority to be paid within such Fiscal Year. (Section 8.2)

**Method of Payment.** The City shall certify within five business days after publication of the City's Executive Budget for the ensuing Fiscal Year the (i) amount which the City reasonably anticipates it will expend in connection with the costs described in Section 8.1 of the Lease and (ii) the amount of the payments described in Section 8.2 of the Lease; provided that, prior to the Board's payment to the City the Board shall have received, in addition to such certification by the City, a certificate of the Consulting Engineer to the effect that such amounts certified by the City for such payments and costs are reasonable and appropriate. Upon the Board's payment of all such amounts so certified or requested and any other payments required under the Act, or, after provisions for their payment have been made, the Board shall pay to the City, as Additional Rent in each Fiscal Year, any surplus of funds received. (Section 8.3)

**Disposition of Property.** The Board agrees that it will not sell, lease, sublease, assign, transfer, encumber (other than Permitted Encumbrances) or otherwise dispose of any part of the Leased Property, or any other real property or personal property which may be acquired by the Board, or its interest in the Lease, without the prior written approval of the City.

The City will not sell, transfer or otherwise dispose of real property or personal property included in the Leased Property without the Board's written consent. In the case of personal property, the value of which is less

than \$1 million per unit (or of greater value if the Board designates), the Board will adopt rules and procedures for the expedited disposition thereof. Upon the City's request to dispose of any real property or personal property valued in excess of \$1 million, the Board will give such consent only upon receipt of a certificate signed by the Consulting Engineer to the effect that such real or personal property may be disposed of without materially adversely affecting the Revenues of the System or impairing the ability of the Board to make any payments required by the Lease or the Agreement or any other agreement to which it may be a party or be bound. The City may also, with the prior written consent of the Board, grant interests in the Leased Property which, in the reasonable judgment of the Board, do not interfere with the operation and maintenance of the System and the collection of the Revenues from the System. *(Section 11.1)*

**Encumbrances.** The Board may not encumber the Leased Property without the prior written approval of the City. The City may grant temporary licenses for use of the Leased Property which do not interfere with the operation and maintenance of the System or the collection of Revenues therefrom. *(Section 11.3)*

### **Summary of the Authority General Resolution**

*Terms used in this Summary of the Resolution shall have the meanings ascribed thereto in "APPENDIX C—GLOSSARY AND SUMMARY OF CERTAIN DOCUMENTS—Glossary".*

**Pledge of Revenues and Funds.** The Authority pledges for the payment of the Principal Installments or Redemption Price of and any interest on the Bonds, in accordance with their terms and the provisions of the Resolution: (i) all Revenues, (ii) all moneys or securities in any of the Funds and Accounts created under the Resolution, except that moneys or securities on deposit in a Special Account are pledged only to the Series of Bonds to which such Account relates and moneys or securities on deposit in the Common Account are pledged only to the Bonds for which a Special Account has not been established pursuant to the General Resolution, and (iii) all other moneys and securities to be received, held or set aside by the Authority or by any Fiduciary pursuant to the Resolution; subject only to the provisions of the Resolution and the Agreement permitting the application of such amounts for or to the purposes and on the terms and conditions therein set forth. It is the intention of the Authority that, to the fullest extent permitted by law, such pledge shall be valid and binding from the time when it is made; that the Revenues, moneys, securities and other funds so pledged, and then or thereafter received by the Authority, shall immediately be subject to the lien of such pledge; and that the obligation to perform the contractual provisions therein contained shall have priority over any or all other obligations and liabilities of the Authority and shall be valid and binding as against all parties having claims of any kind in tort, contract or otherwise against the Authority, irrespective of whether such parties have notice thereof.

As further security for the payment of the Bonds, the Authority, under the Resolution, assigns, transfers and pledges to the Trustee all of its rights and interests under and pursuant to the Agreement (excluding rights to notice and other procedural rights, its right to indemnification and rights and interests not material to Bondholders), including, without limiting the generality of the foregoing, the present and continuing right: (i) to claim, collect or receive from the Board, all Revenues thereunder, (ii) to bring actions and proceedings thereunder for enforcement of such right of collection, and (iii) to do any and all things which the Authority is or may become entitled to do under the Agreement; provided that such assignment shall not impair or diminish any obligation of the Authority under the Agreement.

The Bonds are special obligations of the Authority payable solely from the Revenues and other amounts described in the Resolution and do not and will not constitute an indebtedness of the State, the City or the Board and neither the State, the City nor the Board shall be in any way liable thereon. *(Sections 203 and 501)*

**Establishment of Funds and Accounts.** The Resolution establishes the following Funds:

- (1) Construction Fund;
- (2) Revenue Fund;

- (3) Debt Service Fund;
- (4) Authority Expense Fund;
- (5) Debt Service Reserve Fund;
- (6) Subordinated Indebtedness Fund;
- (7) Surplus Fund; and
- (8) Arbitrage Rebate Fund.

The Resolution establishes in the Debt Service Reserve Fund a separate account known as the "Common Account", and provides that any Supplemental Resolution which authorizes a Special Credit Facility may establish one or more "Special Accounts" in the Debt Service Reserve Fund. The Resolution also establishes in the Debt Service Reserve Fund a separate account to be known as the "Capitalized Interest Account".

UPON THE EFFECTIVE DATE OF THE TWENTY-SECOND SUPPLEMENTAL RESOLUTION, THE RESOLUTION WILL PERMIT THE AUTHORITY TO ESTABLISH A SPECIAL ACCOUNT IN CONNECTION WITH THE ISSUANCE OF ANY SERIES OF BONDS.

The Trustee shall hold all of the Funds and Accounts, except the Authority Expense Fund, which shall be held by the Authority.

The Trustee is directed to make withdrawals and transfers from the Funds and Accounts established by the Resolution in order to comply with any agreement entered into upon or after the date of issuance of the Authority's Fiscal 1987 Series A Bonds providing for the rebate of certain arbitrage earnings to the United States. (*Section 502*)

**Construction Fund.** The Authority shall deposit from time to time in the Construction Fund the net proceeds from the sale of each Series of Bonds and make the deposits in the Funds and Accounts required by the applicable Supplemental Resolutions. The Authority shall also deposit from time to time in the Construction Fund any other amounts required to be deposited therein pursuant to the Resolution or the Agreement, including amounts received by the Authority for or in connection with the System and determined by the Authority to be deposited therein. Any proceeds of insurance maintained by the Board or the City against physical loss of or damage to the System, or of contractors' performance bonds pertaining to the construction of the System, shall also be paid into the Construction Fund.

Except as otherwise provided, amounts in the Construction Fund may only be expended to pay Costs of Water Projects (including Costs of Issuance). The Trustee shall make payments from the Construction Fund, except as otherwise provided, only upon receipt of a Disbursement Request signed by an Authorized Representative of the Authority.

To the extent that other moneys are not available therefor in any other Fund or Account, amounts in the Construction Fund shall be applied to the payment of principal of and interest on Bonds when due. (*Section 503*)

**Allocation of Revenues—Revenue Fund.** The Authority shall cause all Revenues received from the Board pursuant to the Agreement to be paid to the Trustee and deposited promptly upon receipt in the Revenue Fund. There shall also be deposited in the Revenue Fund all other amounts required by the Resolution or the Agreement to be so deposited. (*Section 504*)

UPON THE EFFECTIVE DATE OF THE TWENTY-SECOND SUPPLEMENTAL RESOLUTION, THE RESOLUTION WILL REQUIRE THE AUTHORITY TO DEPOSIT ALL REVENUES INTO THE REVENUE FUND.

**Payments Into Certain Funds.** From the Revenues in the Revenue Fund, the Trustee shall make, as soon as practicable in each month, the following deposits in the following order:

(i) to the Debt Service Fund all such amounts until the amount therein on deposit in such month equals the Minimum Monthly Balance for such month for all Series of Bonds Outstanding;

(ii) from the balance, if any, remaining in such month after making the deposits required in (i) above, to the Authority Expense Fund the entire balance until the total on deposit therein in such month is equal to the product obtained by multiplying (A) the sum of the Authority Expenses for the then current Fiscal Year plus (if included in the Authority Budget for the then current Fiscal Year) an amount (the "Reserve for Expenses") equal to one-sixth (th) of such Authority Expenses by (B) a fraction, the numerator of which is 12 minus the number of full months, excluding the month of calculation, remaining in the Fiscal Year, and the denominator of which is 12;

(iii) from the balance, if any, remaining after making the deposits required in (i) and (ii) above, *first*, to the Common Account in the Debt Service Reserve Fund, the amount, if any, necessary to make the total on deposit in the Common Account equal to the Debt Service Reserve Requirement for the Bonds to which such Common Account relates or, if less than sufficient, the entire balance and, *second*, to each Special Account until the amount therein on deposit equals the Debt Service Reserve Requirement for the Bonds to which each Special Account relates; provided, however, if the balance remaining is less than sufficient to credit in full each Special Account, credit shall be made pro rata among all Special Accounts in the same ratio as the Debt Service Reserve Requirement related to such Special Account bears to the sum of the Debt Service Reserve Requirements for all of the Bonds related to the Special Accounts; and

(iv) from the balance, if any, remaining after making the deposits required in (i), (ii) and (iii) above, to the Subordinated Indebtedness Fund the amount required to be deposited in accordance with the Authority Budget, or the entire balance, if less than sufficient.

Beginning with the first day of each Fiscal Year, the Trustee shall calculate the amounts deposited in the Revenue Fund on a daily basis until the total of all amounts deposited therein during such Fiscal Year is at least equal to the Cash Flow Requirement. On such date, if any, the Trustee is directed to give the notice to the Authority and the Board provided in Section 4.3(b) of the Agreement. Thereafter, during each Fiscal Year, no further Revenues shall be paid to the Trustee pursuant to paragraph Fourth of Section 4.2(c) of the Agreement so long as the Cash Flow Requirement, as the same may be revised from time to time, continues to be met. (*Section 505*)

**Debt Service Fund.** The Trustee shall, for each Series of Bonds Outstanding, pay from the Debt Service Fund the amounts due on each Bond Payment Date for the payment of the Principal Installments, if any, and from the moneys in the Debt Service Fund, including moneys in the Capitalized Interest Account in such Fund, interest on the Outstanding Bonds and on the redemption date or date of purchase, the amounts required for the payment of accrued interest on Bonds to be redeemed or purchased on such date unless the payment of such accrued interest shall be otherwise provided.

The Trustee may, and if so directed by an Authorized Representative of the Authority shall, prior to the forty-fifth day preceding the due date of each Sinking Fund Installment, apply the amounts accumulated in the Debt Service Fund for such Sinking Fund Installment, together with any interest on the Bonds for which such Sinking Fund Installment was established: (i) to the purchase of Bonds of like Series and maturity at prices (including any brokerage and other charges) not exceeding the Redemption Price payable for such Bonds when such Bonds are redeemable with such Sinking Fund Installment plus unpaid interest accrued or (ii) to the redemption of such Bonds, if redeemable by their terms, at or below said Redemption Price. Upon such purchase or redemption of any Bond, the Trustee shall then credit an amount equal to the principal of the Bond so purchased or redeemed toward the next Sinking Fund Installments thereafter to become due and the amount of any excess over the amount of such Sinking Fund Installment shall be credited against future Sinking Fund Installments in direct chronological order.

In any event, the Trustee shall, as soon as practicable after the forty-fifth day preceding the due date of any such Sinking Fund Installment, call for redemption a sufficient amount of Bonds of like Series and maturity to complete the retirement of the principal amount specified for such Sinking Fund Installment of such Bonds



whether or not it then has moneys in the Debt Service Fund to pay the applicable Redemption Price thereof on the redemption date. The Trustee shall apply to the redemption of the Bonds on each such redemption date the amount required for the redemption of such Bonds. (*Sections 506 and 514*)

**Authority Expense Fund.** The Authority shall apply amounts credited to the Authority Expense Fund to the payment of Authority Expenses. Any moneys in the Authority Expense Fund which the Authority determines are in excess of that needed to meet the sum of the unpaid Authority Expenses for such Fiscal Year plus (if such amount was included in the Authority Budget for such Fiscal Year) the Reserve for Expenses, shall be applied toward any deficiencies in the following Funds and Accounts in the order stated: the Debt Service Fund, Debt Service Reserve Fund and Subordinated Indebtedness Fund. Any remaining amounts shall be credited to the Revenue Fund. (*Section 507*)

**Debt Service Reserve Fund.** The Resolution establishes a Debt Service Reserve Fund and a Common Account therein. In addition, the Resolution provides that any Supplemental Resolution which provides for a Special Credit Facility to secure the principal, interest or Tender Option Price of any Bonds may establish one or more "Special Accounts" in the Debt Service Reserve Fund. From the proceeds of each Series of Bonds there shall be deposited in the Debt Service Reserve Fund the amount, if any, necessary to make the amount on deposit therein equal to the Debt Service Reserve Requirement, after giving effect to the issuance of such Bonds; and all such amounts will be credited to the Common Account, unless a Supplemental Resolution requires a deposit in a Special Account. Amounts on deposit in the Common Account will be applied, to the extent necessary, to pay the Principal Installments of and interest on the Bonds; provided, however, that the amounts in the Common Account may not be applied to pay the Principal Installments or Tender Option Price of or interest on Bonds for which such payments are secured by a Special Credit Facility, if the Supplemental Resolution authorizing such Bonds has established a Special Account. Likewise, amounts in any Special Account may not be applied to pay the Principal Installments of or interest on any Bond for which such payments may be made from the Common Account. Amounts on deposit in each of the Accounts in the Debt Service Reserve Fund shall be applied, to the extent other funds are not available in the Surplus Fund, the Subordinated Indebtedness Fund and the Authority Expense Fund, to pay the Principal Installments of, and interest on the Bonds to which such Account relates when due. Amounts so applied shall be derived first from cash or Investment Securities on deposit, and second from draws and demands on Financial Guaranties.

If, as of June 30 of each year, the amount in any Account in the Debt Service Reserve Fund exceeds the applicable Debt Service Reserve Requirement after giving effect to any Financial Guaranty deposited in such Fund, the Trustee shall withdraw from such Account the amount of any excess therein over the applicable Debt Service Reserve Requirement as of the date of such withdrawal and deposit the moneys so withdrawn into (i) the Arbitrage Rebate Fund, the amount established by the Authority to be required by the Code to be rebated to the Department of the Treasury and (ii) the Surplus Fund, the amount of any excess then remaining in the Debt Service Reserve Fund over the applicable Debt Service Reserve Requirement. If, as of February 1 of each year, the amount in any Account in the Debt Service Reserve Fund is less than the applicable Debt Service Reserve Requirement and, to the extent that such deficiency has not been made up by May 1 of such year by either (i) deposits pursuant to Section 505, Section 510 or Section 510-a of the Resolution or (ii) an increase in the market value of the Investment Securities therein, or (iii) a combination of (i) and (ii), the Authority shall, in its Authority Budget for the ensuing Fiscal Year, include the amount necessary to make up such deficiency as a Required Deposit.

UPON THE EFFECTIVE DATE OF THE TWENTY-SECOND SUPPLEMENTAL RESOLUTION, THE FIRST SENTENCE OF THE PROVISION OF THE RESOLUTION SUMMARIZED IN THE PRECEDING PARAGRAPH WILL READ AS FOLLOWS:

If, as of June 30 of each year, the amount in any Account in the Debt Service Reserve Fund exceeds the applicable Debt Service Reserve Requirement after giving effect to any Financial Guaranty deposited in such Fund, the Trustee shall, on the first business day of the following Fiscal Year, withdraw from such Account the amount of any excess therein over the applicable Debt Service Reserve Requirement as of the date of such withdrawal for deposit into (i) the Arbitrage Rebate Fund, the amount estimated by the Authority to be required

by the Code to be rebated to the Department of the Treasury, (ii) the Surplus Fund, the amount required to be deposited therein in accordance with the Authority Budget, and (iii) the Revenue Fund, the amount of any excess then remaining in the Debt Service Reserve Fund over the applicable Debt Service Reserve Fund Requirement.

Whenever the amount (exclusive of Financial Guaranties) in all of the Accounts in the Debt Service Reserve Fund, together with the amount in the Debt Service Fund, is sufficient to pay all Outstanding Bonds in accordance with their respective terms, the funds on deposit in the Debt Service Reserve Fund shall be transferred to the Debt Service Fund and applied to the redemption or payment at maturity of all Bonds Outstanding.

In lieu of the required deposits and transfers to the Debt Service Reserve Fund, the Authority may cause to be deposited into the Debt Service Reserve Fund Financial Guaranties in an amount equal to the difference between the Debt Service Reserve Requirement and the sums, if any, then on deposit in the Debt Service Reserve Fund or being deposited in the Debt Service Reserve Fund concurrently with such Financial Guaranties. The Financial Guaranties shall be payable (upon the giving of notice as required thereunder) on any date on which moneys will be required to be withdrawn from the Debt Service Reserve Account and applied to the payment of a Principal Installment of or interest on any Bonds and such withdrawal cannot be met by amounts on deposit in the Debt Service Reserve Fund. If a disbursement is made pursuant to Financial Guaranties, the Authority shall be obligated either (i) to reinstate the maximum limits of such Financial Guaranties or (ii) to deposit into the Debt Service Reserve Fund, funds in the amount of the disbursement made under such Financial Guaranties, or a combination of such alternatives, as shall provide that the amount in the Debt Service Reserve Fund equals the Debt Service Reserve Requirement.

In the event of the refunding of any Bonds, the Trustee shall, upon the written direction of the Authority, withdraw from the Debt Service Reserve Fund all or any portion of amounts accumulated therein with respect to the Bonds being refunded and deposit such amounts as provided in such written direction; provided that such withdrawal shall not be made unless (a) immediately thereafter the Bonds being refunded shall be deemed to have been paid pursuant to Section 1201 of the Resolution, and (b) the amount remaining in the Debt Service Reserve Fund after such withdrawal shall not be less than the Debt Service Reserve Requirement. (*Section 508*)

**Subordinated Indebtedness Fund.** The Trustee shall apply amounts on deposit in the Subordinated Indebtedness Fund solely to the maintenance of reserves for, or the payment of, Subordinated Indebtedness (or as otherwise provided by the resolution of the Authority authorizing each issue of Subordinated Indebtedness). The Trustee shall withdraw from the Subordinated Indebtedness Fund any amount necessary to render the balances in the Debt Service Fund or Debt Service Reserve Fund sufficient to meet the requirements of such Funds. (*Section 509*)

**Surplus Fund.** The Trustee shall, on each Bond Payment Date, apply moneys credited to the Surplus Fund in the following amounts: (i) to the Debt Service Fund the amount, if any, necessary (or all the moneys in the Surplus Fund if less than the amount necessary) to make up any deficiency in the amount required to be on deposit in such Fund and (ii) to the Debt Service Reserve Fund the amount, if any, necessary (or all the moneys in the Surplus Fund if less than the amount necessary) to make up any deficiency in the amount required to be on deposit in any Account in such Fund. Such transfer shall be made notwithstanding any other provisions of this Resolution requiring deposits in such Funds. Amounts on deposit in the Surplus Fund on the last day of a Fiscal Year shall be withdrawn from such Fund and transferred to the Board for deposit in the Local Water Fund. (*Section 510*)

**Arbitrage Rebate Fund.** Amounts on deposit in the Arbitrage Rebate Fund shall be applied by the Trustee to make payments to the Department of the Treasury of the United States of America. Notwithstanding the foregoing, the Trustee shall apply moneys credited to the Arbitrage Rebate Fund in the following amounts: (i) to the Debt Service Fund the amount, if any, necessary (or all the moneys in the Arbitrage Rebate Fund if less than the amount necessary) to make up any deficiency in the amount required to be on deposit in the Debt Service Fund and (ii) to the Debt Service Reserve Fund the amount, if any, necessary (or all the moneys in the

Arbitrage Rebate Fund if less than the amount necessary) to make up any deficiency in the amount required to be on deposit in any Account in the Debt Service Reserve Fund.

Amounts on deposit in the Arbitrage Rebate Fund in excess of the amount required to be maintained therein for the purposes of such Fund may be transferred and paid by the Trustee to the Surplus Fund. (*Section 510-a*)

**Subordinated Indebtedness.** The Authority may issue Subordinated Indebtedness payable out of and secured by a pledge of and lien on amounts in the Subordinated Indebtedness Fund available for such payment. Such Subordinated Indebtedness, however, shall be issued only for the purposes set forth in the Resolution and shall be secured by a pledge subordinate in all respects to the pledge created by the Resolution as security for the Bonds. (*Section 511*)

**Depositaries.** All moneys or securities held by the Trustee shall constitute trust funds and the Trustee may and shall, if directed by the Authority, deposit such moneys or securities with one or more Depositaries. All moneys or securities held by the Authority in the Authority Expense Fund shall be deposited with one or more Depositaries. All moneys or securities deposited under the provisions of the Resolution with the Trustee or any Depositary shall be held in trust and applied only in accordance with the provisions of the Resolution, and each of the Funds established by the Resolution shall be a trust fund for the purposes thereof.

Each Depositary holding moneys or securities in trust for the Trustee shall be a bank or trust company organized under the laws of the State or a national banking association (having its principal office within the State), having capital stock, surplus and undivided earnings aggregating at least \$100,000,000 and willing and able to accept the office on reasonable and customary terms and authorized by law to act in accordance with the provisions of the Resolution. (*Section 512*)

**Investment of Certain Funds.** Moneys held in the Debt Service Fund, the Debt Service Reserve Fund and the Subordinated Indebtedness Fund (subject to the terms of any resolutions or other instruments securing any issue of Subordinated Indebtedness) shall be invested and reinvested to the fullest practicable extent in Investment Securities which mature not later than such times as shall be necessary to provide moneys when needed to make payments required from such Funds; provided that in the case of the Debt Service Reserve Fund maturation may not occur later than fifteen years from the date of such investment, and in the case of the Debt Service Fund, investments shall be of the type described in clauses (ii), (iii) and (vi), and in the case of the Debt Service Reserve Fund, clauses (ii) and (iii), of the definition of "Investment Securities" (in either case, to the fullest extent practicable). Moneys in the Authority Expense Fund, the Revenue Fund, the Construction Fund, the Arbitrage Rebate Fund and the Surplus Fund may be invested in Investment Securities which mature no later than such times as shall be necessary to provide moneys when needed to make payments from such Funds. The Trustee shall make all investments in accordance with written instructions from any Authorized Representative of the Authority. Moneys in any Fund or Account may be combined with moneys in any other Fund or Account for the purpose of making such investments in Investment Securities.

Interest (net of that which represents a return of accrued interest paid in connection with the purchase of any investment) earned on any moneys or investments in such Funds and Accounts, other than the Construction Fund, the Arbitrage Rebate Fund and the Debt Service Reserve Fund, shall be paid into the Revenue Fund as and when received. Interest (net of that which represents a return of accrued interest paid in connection with the purchase of any investment) earned on any moneys or investments in (i) the Debt Service Reserve Fund shall be paid into the Arbitrage Rebate Fund or the Surplus Fund, (ii) the Construction Fund shall be paid to the Board for deposit in the Local Water Fund quarterly, on the 15th day of each July, October, January and April of each Fiscal Year upon receipt of a written request and a certificate of the Authority relating to the satisfaction of the Cash Flow Requirement and (iii) the Arbitrage Rebate Fund shall remain in such fund.

All Investment Securities acquired with moneys in any Fund or Account, including any Fund or Account held by the Authority, shall be held by the Trustee in pledge or by a Depositary as agent in pledge in favor of the Trustee. (*Section 514*)

**Additional Bonds.** The Authority may issue Bonds from time to time without limitation as to amount except as provided in the Resolution or as specified by law to generate funds sufficient to meet the Costs of Water Projects, to make deposits in the Funds and Accounts or to refund Outstanding Bonds, Bond Anticipation Notes, Subordinated Indebtedness or outstanding bonds of the City issued to pay the capital costs of the System. All Bonds shall be issued subject to the terms, conditions and limitations established in the Resolution and in one or more Series as therein provided.

Bonds shall be authenticated and delivered only upon the Trustee's receipt of, among other items:

- (a) a certified copy of the Supplemental Resolution authorizing such Series;
- (b) (i) in the case of the initial Series of Bonds, an executed copy of the Agreement and the Lease; and (ii) in the case of any subsequent Series of Bonds, an executed copy of any amendment or supplement to the Agreement or the Lease not theretofore delivered to the Trustee;
- (c) except in the case of Series of Bonds issued prior to July 1, 1986 and any Series of Refunding Bonds issued pursuant to Section 207 of the Resolution, a certificate of an Authorized Representative of the Authority setting forth (i) the Revenues for either of the last two full Fiscal Years immediately preceding the Fiscal Year in which such Bonds are to be issued and (ii) the Aggregate Debt Service during such Fiscal Year for which Revenues are set forth pursuant to clause (i) above (excluding from Aggregate Debt Service any Principal Installment or portion thereof which was paid from sources other than Revenues) and (iii) the sum of the Operating Expenses and the Required Deposits for such period, and showing that the amount set forth in (i) is at least equal to the sum of (x) an amount equal to 115% of the amount set forth in (ii) and (y) an amount equal to 100% of the amount set forth in (iii);
- (d) except in the case of the initial Series of Bonds under the Resolution and any Series of Refunding Bonds issued pursuant to Section 207 of the Resolution, a certificate of the Consulting Engineer setting forth the projected Operating Expenses for each of the five Fiscal Years following the Issuance of such Series of Bonds (plus the Fiscal Year in which such Bonds are issued);
- (e) except in the case of the initial Series of Bonds under the Resolution and any Series of Refunding Bonds issued pursuant to Section 207, a certificate, signed by an Authorized Representative of the Authority setting forth the estimated Required Deposits for each of the five Fiscal Years following the issuance of such Series of Bonds (plus the Fiscal Year in which such Bonds are issued); and
- (f) except in the case of the initial Series of Bonds under the Resolution and any Series of Refunding Bonds issued pursuant to Section 207, a certificate of the Rate Consultant (i) setting forth the estimated Revenues for each of the five Fiscal Years following the issuance of such Series of Bonds (plus the Fiscal Year in which such Bonds are issued) after giving effect to any increases or decreases in rates, fees and charges projected for such Fiscal Years and (ii) showing for each such Fiscal Year that the estimated Revenues for such Fiscal Year will be at least equal to the sum of (A) 115% of the maximum estimated Adjusted Aggregate Debt Service on all Bonds then Outstanding including the Bonds to be issued, and (B) 100% of the sum of the projected Operating Expenses and Required Deposits, as shown on the Certificate of the Consulting Engineer delivered pursuant to paragraph (e) above and the Certificate of the Authority delivered pursuant to paragraph (f) above, respectively. (*Sections 204 and 206*)

**Refunding Bonds.** One or more Series of Refunding Bonds may be issued pursuant to Section 207 of the Resolution at any time to refund any Outstanding Bonds provided that (i) estimated average annual Debt Service on such Series of Refunding Bonds shall not exceed the average annual Debt Service on the Bonds to be refunded and (ii) the maximum Debt Service in any Fiscal Year on such Series of Refunding Bonds shall not exceed the maximum Debt Service in any Fiscal Year on the Bonds to be refunded, all as shown in a Certificate signed by an Authorized Representative of the Authority and delivered to the Trustee prior to the authentication and delivery of such Series of Refunding Bonds. Refunding Bonds shall be issued in a principal amount sufficient, together with other moneys available therefor, to accomplish such refunding and to make the deposits in the Funds and Accounts required by the provisions of the Supplemental Resolution authorizing such Bonds. (*Section 207*)

**Bond Anticipation Notes.** Whenever the Authority shall authorize the issuance of a Series of Bonds, the Authority may, by resolution, authorize the issuance of notes (and renewals thereof) in anticipation of such Series of Bonds. The principal of and interest on such notes and renewals thereof shall be payable from the proceeds of such notes or from the proceeds of the sale of the Series of Bonds in anticipation of which such notes are issued. The proceeds of such Bonds may be pledged for the payment of the principal of and interest on such notes and any such pledge shall have a priority over any other pledge of such proceeds created by the Resolution. The Authority may also pledge the Revenues to the payment of the interest on, and subject to Section 707 of the Resolution, the principal of such notes. A copy of the Resolution of the Authority authorizing such notes, certified by an Authorized Representative of the Authority, shall be delivered to the Trustee following its adoption, together with such other information concerning such notes as the Trustee may reasonably request. *(Section 208)*

**Credit Facilities.** In connection with the issuance of any Series of Bonds, the Authority may obtain or cause to be obtained one or more Credit Facilities providing for payment of all or a portion of the Principal Installments, or Redemption Price or interest due or to become due on such Bonds, providing for the purchase of such Bonds by the issuer of such Credit Facility or providing funds for the purchase of such Bonds by the Authority.

The Authority may secure such Credit Facility by an agreement providing for the purchase of the Series of Bonds secured thereby with such adjustments to the rate of interest, method of determining interest, maturity or redemption provisions as specified by the Authority in the applicable Supplemental Resolution. The Authority may also in an agreement with the issuer of such Credit Facility agree to directly reimburse such issuer for amounts paid under the terms of such Credit Facility, together with interest thereon (the "Reimbursement Obligation"); provided, however, that no Reimbursement Obligation shall be created until amounts are paid under such Credit Facility. Any such Reimbursement Obligation (a "Parity Reimbursement Obligation") may be secured by a pledge of, and a lien on Revenues on a parity with the lien created by Section 501 of the Resolution. Upon the payment of amounts under the Credit Facility which payment results in the Parity Reimbursement Obligation becoming due and payable, such Parity Reimbursement Obligation shall be deemed to be part of the Series of Bonds to which the Credit Facility which gave rise to such Parity Reimbursement Obligation relates.

Any such Credit Facility shall be for the benefit of and secure such Series of Bonds or portion thereof, as specified in the applicable Supplemental Resolution. *(Section 209)*

**Indebtedness and Liens.** The Resolution provides that the Authority shall not issue any bonds, or other evidences of indebtedness, other than the Bonds, Bond Anticipation Notes, Subordinated Indebtedness and Parity Reimbursement Obligations, secured by a pledge of or other lien on the Revenues and shall not create or cause to be created any lien on such Revenues or on any amounts held by any Fiduciary, under the Resolution; however, the Authority may: (i) issue notes payable from the proceeds of Bonds or other obligations for the corporate purposes of the Authority payable or secured by Revenues derived on and after such date as the pledge of the Revenues provided in the Resolution is discharged and satisfied and (ii) issue bonds or other obligations for the corporate purposes of the Authority payable out of or secured by the pledge of amounts in the Local Water Fund after satisfaction of the Cash Flow Requirement for the then current Fiscal Year, and which recite on their face that such pledge of said amounts is and shall be in all respects subordinate to the provisions of the lien and pledge created by the Resolution. *(Section 707)*

**Agreement of the State.** In accordance with Section 1045-t of the Act, the Authority agrees, for and on behalf of the State, that the State will not alter or limit the rights vested by the Act in the Authority or the Board to fulfill the terms of any agreement made with or for the benefit of the Bondholders, or in any way impair the rights and remedies of Bondholders, until the Bonds, together with the interest thereon, with interest on any unpaid installment of interest, and all costs and expenses in connection with any action or proceeding by or on behalf of such holders, are fully met and discharged. *(Section 711)*

**Authority Budget.** The Authority shall, on or before May 1, in each Fiscal Year, adopt and file with the Trustee, the Board and the City, a certified copy of the Authority Budget showing the estimated Cash Flow Requirement and the components thereof (on a monthly basis) for the ensuing Fiscal Year, together with any other information required to be set forth therein by the Resolution or the Agreement. Such Authority Budget may set forth such additional information as the Authority may determine or as the Board or the City may request. If for any reason the Authority shall not have adopted the Authority Budget before such May 1, the Authority Budget for the then current Fiscal Year shall be deemed to be the Authority Budget for the ensuing Fiscal Year until a new Authority Budget is adopted. The Authority may at any time adopt an amended Authority Budget for the then current or ensuing Fiscal Year, but no such amended Authority Budget shall supersede any prior Budget until the Authority shall have filed with the Trustee, the Board and the City a copy of such amended Authority Budget. Each month the Authority shall recalculate the Cash Flow Requirement. (*Sections 712 and 713*)

**Enforcement and Amendment of Agreement and Lease.** The Authority shall enforce or cause to be enforced the provisions of the Agreement and the Lease and duly perform its covenants and agreements under the Agreement. The Authority will not consent or agree to or permit any rescission of or amendment to or otherwise take any action under or in connection with the Agreement or the Lease except in accordance with Article X of the Agreement of the Resolution. (*Section 714*)

**Supplemental Resolutions.** The Resolution permits the modification or amendment of the rights and obligations of the Authority and of the holders of the Bonds thereunder by a Supplemental Resolution, with the written consent of the holders of two-thirds of the principal amount of: (i) the Bonds then Outstanding and (ii) in case less than all of the several Series of Bonds then Outstanding are affected by the modification or amendment, of the Bonds of the Series so affected and then Outstanding; however, if such modification or amendment will, by its terms, not take effect so long as any Bonds of any specified like Series and maturity remain Outstanding, the consent of the holders of such Bonds shall not be required and such Bonds shall not be deemed to be Outstanding for the purpose of modification; provided no such modification or amendment shall change the terms of redemption, maturity of principal, installment of interest, or reduce the principal amount, Redemption Price, or rate of interest without the consent of the holder of the affected Bond, or reduce the percentages of consents required to effect any future modification or amendment.

The Authority may adopt (without the consent of any holders of the Bonds) supplemental resolutions to authorize additional Bonds; to add to the restrictions contained in the Resolution upon the issuance of additional indebtedness; to add to the covenants of the Authority contained in, or surrender any rights reserved to or conferred upon it by, the Resolution; to confirm any pledge under the Resolution of Revenues or other moneys; to preserve the Federal tax exemption of interest on the Bonds; or otherwise to modify any of the provisions of the Resolution (but no such other modification may be effective while any of the Bonds of any Series theretofore issued are Outstanding); or to cure any ambiguity, supply any omission or to correct any defect in the Resolution or to insert such provisions clarifying matters or questions arising under the Resolution as are necessary or desirable, and are not contrary to or inconsistent with the Resolution as theretofore in effect or to provide for additional duties of the Trustee (provided that the Trustee shall consent thereto). (*Arts. VIII and IX*)

**Defaults and Remedies.** The Resolution provides that if one or more of the following Events of Default shall occur, namely: (i) a default in the payment of the principal or Redemption Price of any Bond; (ii) a default in payment of any installment of interest on any Bond; (iii) a default by the Authority in the performance or observance of any other of its covenants, agreements or conditions in the Resolution for a period of 45 days after written notice thereof; (iv) a default under the Agreement or the Lease by the Board or the City for a period of 45 days after written notice thereof; or (v) a filing of a petition for relief under any Federal or State bankruptcy or similar law by the Authority; then, upon the happening and continuance of any Event of Default, the Trustee may, and upon the written request of the holders of not less than a majority in principal amount of the Bonds Outstanding the Trustee shall, declare the principal and accrued interest on all the Bonds then Outstanding, due and payable immediately subject, however, to rescission of such declaration and annulment of the default upon the remedying thereof

The Authority covenants that upon the occurrence of an Event of Default, the books of record and account of the Authority shall at all times be subject to the inspection and use of the Trustee and of its agents and attorneys and that, upon demand of the Trustee, the Authority will account, as if it were the trustee of an express trust, for all Revenues and other moneys, securities and funds pledged or held under the Resolution for such period as shall be stated in such demand.

Upon default, the Trustee may proceed to protect and enforce its rights and the rights of the holders of the Bonds under the Resolution forthwith by a suit or suits in equity or at law, whether for the specific performance of any covenant therein contained, or in aid of the execution of any power therein granted, or for an accounting against the Authority as if the Authority were the trustee of an express trust, or in the enforcement of any other legal or equitable right as the Trustee, being advised by counsel, shall deem most effectual to enforce any of its rights or to perform any of its duties under the Resolution. During the continuance of an Event of Default, Revenues shall be applied first, to the reasonable and proper charges and expenses of the Trustee; then (unless the principal of all of the Bonds shall have been declared payable) to the payment of all unpaid interest ratably, and then to unpaid principal or Redemption Price, ratably; and if all of the principal of the Bonds shall be due and payable, to the payment of unpaid principal and interest, without preference or priority of interest over principal, principal over interest or of any Bond or installment over any other Bond or installment, without any discrimination or preference. No Bondholder has any right to institute suit to enforce any provision of the Resolution or the execution of any trust thereunder or for any remedy thereunder, unless the Trustee has been requested by the holders of at least a majority in principal amount of the Bonds to take such action and has been offered adequate security and indemnity and has failed to commence such suit in the manner provided in the Resolution. The right to appoint a statutory trustee under Section 1045-p of the Act is expressly abrogated. (*Art. X*)

**Defeasance of Bonds Other than Variable Rate or Option Bonds.** Any Outstanding Bond shall prior to the maturity or redemption date thereof be deemed to have been paid and shall cease to be entitled to any lien, benefit or security under the Resolution if (i) in the case of any Bonds to be redeemed prior to their maturity, the Authority shall have given to the Trustee irrevocable instructions accepted in writing by the Trustee to publish on such date the notice of redemption therefor (other than Bonds purchased by the Trustee prior to the publication of the notice of redemption), (ii) there shall have been deposited with the Trustee either moneys in an amount sufficient, or Defeasance Obligations the principal of and the interest on which, when due, without reinvestment, will provide moneys which, together with the moneys deposited shall be sufficient, to pay when due the principal or Redemption Price (if applicable) and interest due and to become due on said Bonds and (iii) in the event said Bonds are not by their terms subject to redemption within the next succeeding 60 days, the Authority shall have given the Trustee irrevocable instructions to publish, as soon as practicable, a notice to the holders of such Bonds that the deposit required above has been made with the Trustee and that said Bonds are deemed paid in accordance with the Resolution and stating such maturity or redemption date upon which moneys are to be available to pay the principal or Redemption Price, if applicable, on such Bonds (other than Bonds purchased by the Trustee prior to the publication of the notice of redemption); provided that any notice published for Bonds constituting less than all of the Outstanding Bonds of any maturity within a Series shall specify the letter and number or other distinguishing mark of each such Bond. The Trustee shall, to the extent necessary, apply moneys to the retirement of said Bonds in amounts equal to the unsatisfied balances of any Sinking Fund Installments thereto.

The Trustee shall, if so directed by the Authority prior to the maturity date of Bonds deemed to have been paid which are not to be redeemed prior to their maturity date or prior to the publication of the above notice of redemption for Bonds deemed paid and to be redeemed, apply moneys deposited with the Trustee in respect of such Bonds and redeem or sell Defeasance Obligations so deposited with the Trustee and purchase such Bonds and the Trustee shall immediately thereafter cancel all such Bonds so purchased; provided, however, that the moneys and Defeasance Obligations remaining on deposit with the Trustee after the purchase and cancellation of such Bonds shall be sufficient to pay when due the Principal Installment or Redemption Price, if applicable, and interest due or to become due on all Bonds.

**Defeasance of Variable Rate Bonds.** The Resolution provides that for the purposes of determining whether Variable Rate Bonds shall be deemed to have been paid prior to the maturity or redemption date thereof, by the deposit of moneys, or Defeasance Obligations and moneys (if any), the interest due on such Bonds shall be calculated at the maximum rate permitted; provided, however, that if, as a result of such Bonds having borne interest at less than the maximum rate for any period, the total amount of moneys and Investment Securities on deposit with the Trustee for the payment of interest on such Bonds exceeds the total amount required to be deposited with the Trustee, the Trustee shall, if requested by the Authority, pay the amount in excess to the Authority free and clear of any lien or pledge securing the Bonds or otherwise existing under the Resolution.

**Defeasance of Option Bonds.** Under the Resolution, Option Bonds shall be deemed paid in accordance with the Resolution only if, in addition to satisfying several of the requirements applicable to other than Variable Rate or Option Bonds, there shall have been deposited with the Trustee moneys in an amount which shall be sufficient to pay the maximum amount of principal of and premium due, if any, and interest on such Bonds which could become payable to the holders of such Bonds upon the exercise of any options provided to the holders of such Bonds; provided, however, that if the options originally exercisable by the holder of an Option Bond are no longer exercisable, such Bond shall not be considered an Option Bond. (*Section 1201*)



**APPENDIX D**

**NEW YORK CITY WATER AND SEWER SYSTEM**  
**Audited Combined Financial Statements and Schedules**  
**Fiscal Years 1996 and 1995**

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**FISCAL YEAR 1996 AUDITED  
FINANCIAL STATEMENTS**

**OF**

**NEW YORK CITY WATER AND  
SEWER SYSTEM**

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**Independent Auditors' Report**

To the Members of the Boards of the  
New York City Municipal Water Finance Authority and the  
New York City Water Board

We have audited the accompanying combined balance sheets of the New York City Water and Sewer System as of June 30, 1996 and 1995 and the related combined statements of revenues, expenses and changes in retained earnings, and cash flows for the years then ended. These combined financial statements are the responsibility of the New York City Water and Sewer System's management. Our responsibility is to express an opinion on these combined financial statements based on our audits.

We conducted our audits in accordance with generally accepted auditing standards. Those standards require that we plan and perform the audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. We believe that our audits provide a reasonable basis for our opinion.

In our opinion, the combined financial statements referred to above present fairly, in all material respects, the financial position of the New York City Water and Sewer System as of June 30, 1996 and 1995, and the results of its operations and changes in retained earnings and its cash flows for the years then ended in conformity with generally accepted accounting principles.

Our audits were made for the purpose of forming an opinion on the combined financial statements taken as a whole. The supplementary information included in Schedules I through IX is presented for purposes of additional analysis and is not a required part of the combined financial statements. Such information has been subjected to the auditing procedures applied in the audits of the combined financial statements and, in our opinion, is fairly presented in all material respects in relation to the combined financial statements taken as a whole.

*KPMG Peat Marwick LLP*

October 18, 1996



**NEW YORK CITY WATER AND SEWER SYSTEM**

Combined Balance Sheets

June 30, 1996 and 1995

(in thousands)

Assets	1996	1995	Liabilities and Equity	1996	1995
Utility plant in service, less accumulated depreciation of \$ 3,304,184 in 1996 and \$ 3,084,337 in 1995 (notes 2, 5 and 7)	\$ 7,172,466	6,878,082	Long-term liabilities:		
Construction work-in-progress	<u>3,638,283</u>	<u>3,182,645</u>	Bonds and notes payable, less current portion (note 9)	6,615,022	5,546,556
	<u>10,810,749</u>	<u>10,060,727</u>	Net discount on bonds and notes payable	(298,314)	(255,845)
			Deferred bond refunding costs (note 2)	<u>(128,029)</u>	<u>(128,997)</u>
Current assets:			Total long-term liabilities	<u>6,188,679</u>	<u>5,161,714</u>
Unrestricted cash and cash equivalents (note 6)	6,503	3,686	Current liabilities:		
Investments (note 6)	<u>1,512</u>	<u>1,570</u>	Accounts payable and accrued expenses	37,320	26,841
Accounts receivable:			Revenues received in advance	58,353	70,538
Billed, less allowance for uncollectible water and sewer receivables of \$ 272,001 in 1996 and \$ 135,042 in 1995	274,480	409,665	Current portion of bonds and notes payable (note 9)	470,564	503,898
Unbilled	<u>80,367</u>	<u>74,981</u>	Payable to the City (note 8)	228,259	222,330
Receivable from the City (note 8)	28,329	2,758	Refunds payable to customers	<u>5,000</u>	<u>4,325</u>
Accrued interest receivable	<u>18</u>	<u>34</u>	Total current liabilities	<u>799,496</u>	<u>827,932</u>
Total current assets	<u>391,209</u>	<u>492,694</u>	Total liabilities	<u>6,988,175</u>	<u>5,989,646</u>
Restricted assets (notes 6 and 10):			Equity:		
Cash and cash equivalents	474,693	298,964	Contributed capital, net of allocated depreciation (note 2)	4,970,900	5,030,356
Investments	<u>466,411</u>	<u>487,071</u>	Retained earnings	<u>295,971</u>	<u>418,591</u>
Accrued interest receivable	<u>6,771</u>	<u>6,461</u>	Total equity	<u>5,266,871</u>	<u>5,448,947</u>
Total restricted assets	<u>947,875</u>	<u>792,496</u>	Commitments and contingencies (note 11)		
Deferred bond and financing expenses	<u>105,213</u>	<u>92,676</u>	Total liabilities and equity	<u>\$ 12,255,046</u>	<u>\$ 11,438,593</u>
Total assets	<u>\$ 12,255,046</u>	<u>\$ 11,438,593</u>			

See accompanying notes to combined financial statements.

## NEW YORK CITY WATER AND SEWER SYSTEM

### Combined Statements of Revenues, Expenses and Changes in Retained Earnings Years ended June 30, 1996 and 1995 (in thousands)

	<u>1996</u>	<u>1995</u>
Operating revenues:		
Water supply and distribution	\$ 532,171	504,596
Sewer collection and treatment	765,808	717,533
Other operating revenues	<u>72,251</u>	<u>78,326</u>
Total operating revenues	<u>1,370,230</u>	<u>1,300,455</u>
Operating expenses:		
Operation and maintenance (notes 3 and 7)	730,963	738,561
Provision for bad debts	317,051	95,989
Administration and general	<u>14,490</u>	<u>15,047</u>
Total operating expenses	<u>1,062,504</u>	<u>849,597</u>
Excess of operating revenues over operating expenses before depreciation and amortization	307,726	450,858
Depreciation and amortization	<u>240,949</u>	<u>283,374</u>
Operating income	66,777	167,484
Nonoperating revenues (expenses):		
Interest expense	(368,422)	(338,042)
Investment income	<u>67,646</u>	<u>57,511</u>
Net Loss	(233,999)	(113,047)
Retained earnings at beginning of year	418,591	386,414
Depreciation allocated to contributed capital (note 2)	<u>111,379</u>	<u>145,224</u>
Retained earnings at end of year	<u>\$ 295,971</u>	<u>418,591</u>

See accompanying notes to combined financial statements.

**NEW YORK CITY WATER AND SEWER SYSTEM**

Combined Statement of Cash Flows  
Years ended June 30, 1996 and 1995  
(in thousands)

	<u>1996</u>	<u>1995</u>
Cash flows from operating activities:		
Operating income	\$ <u>66,777</u>	<u>167,484</u>
Adjustments to reconcile operating income to net cash provided by operating activities:		
Depreciation and amortization	240,949	283,374
Provision for bad debts	317,051	95,989
Changes in assets and liabilities:		
(Increase) in receivables	(187,546)	(199,678)
(Increase) decrease in receivable from the City	(25,571)	2,729
Decrease in prepaid expenses	-	22,720
Increase (decrease) in payable to the City	5,929	(133,216)
Increase (decrease) in accounts payable and accrued expenses	10,479	(13,129)
(Decrease) in revenues received in advance	(12,185)	(9,077)
Increase (decrease) in refunds payable to customers	675	(16,693)
Total adjustments	<u>349,781</u>	<u>33,019</u>
Net cash provided by operating activities	<u>416,558</u>	<u>200,503</u>
Cash flows from capital and related financing activities:		
Proceeds from issuing bonds, notes and other borrowings, net of issue costs	1,696,451	1,505,595
Repayments of bonds, notes and other borrowings	(745,657)	(1,132,353)
Interest paid on bonds, notes and other borrowings	<u>(344,845)</u>	<u>(314,145)</u>
Net cash provided by capital and related financing activities	<u>605,949</u>	<u>59,097</u>
Cash flows from investing activities:		
Acquisition and construction of capital assets	(926,598)	(509,506)
Proceeds from sales and maturities of investments	37,204,289	30,152,223
Purchases of investments	<u>(37,190,117)</u>	<u>(30,009,396)</u>
Interest on investments	68,465	57,657
Net cash used in investing activities	<u>(843,961)</u>	<u>(309,022)</u>
Net increase (decrease) in cash and cash equivalents	178,546	(49,422)
Cash and cash equivalents, beginning of year	<u>302,650</u>	<u>352,072</u>
Cash and cash equivalents, end of year	\$ <u><u>481,196</u></u>	<u><u>302,650</u></u>

Reconciliation of Cash and Cash Equivalents Per Statement of Cash Flows to the Balance Sheet

	Assets		
	Unrestricted	Restricted	Total
Cash and cash equivalents - beginning	\$ 3,686	298,964	302,650
Net increase	<u>2,817</u>	<u>175,729</u>	<u>178,546</u>
Cash and cash equivalents - ending	\$ <u><u>6,503</u></u>	<u><u>474,693</u></u>	<u><u>481,196</u></u>

The following are the noncash capital and related financing activities:

- Interest expense includes the accretion of capital appreciation bonds discount in the amount of \$10,029 in 1996 and \$9,500 in 1995.
- Capital expenditures in the amount of \$228,259 and \$222,330 had been incurred but not paid at June 30, 1996 and 1995.
- The System received capital assets of \$51,923 in 1996 and \$25,420 in 1995 which represent contributed capital from the City.

See accompanying notes to combined financial statements.

# NEW YORK CITY WATER AND SEWER SYSTEM

## Notes to Combined Financial Statements

June 30, 1996 and 1995

### **(1) Organization**

The New York City Water and Sewer System (the "System") provides water supply and distribution, and sewage collection, treatment, and disposal for The City of New York (the "City"). The System, as presented in the accompanying combined financial statements, began operations on July 1, 1985 and consists of two legally separate and independent entities, the New York City Municipal Water Finance Authority (the "Authority") and the New York City Water Board (the "Board"). The Authority is a public benefit corporation created in accordance with the New York City Municipal Water Finance Act (the "Act"), duly enacted into law as Chapter 513 of the laws of 1984 of the State of New York, as amended by Chapter 514 of the laws of 1984 of the State of New York. The Board was created by Chapter 515 of the laws of 1984 of the State of New York. The Act empowers the Authority to issue bonds or notes to finance the cost of capital improvements to the System, borrow money and to refund any and all outstanding bonds and general obligation bonds of the City issued for water and sewer purposes. The Act empowers the Board to lease the System from the City and to fix and collect rates, fees, rents and other charges for the use of, or for services furnished, rendered, or made available by the System, to produce cash sufficient to pay debt service on the Authority bonds and to place the System on a self-sustaining basis.

The physical operation and capital improvements of the System are performed by the City's Department of Environmental Protection subject to contractual agreements with the Authority and Board.

In accordance with Statement 14 of the Governmental Accounting Standards Board (GASB), the Board and the Authority are combined for general purpose external reporting purposes since the Board and the Authority are fiscally interdependent. The System, in turn, is included for reporting purposes as a discretely presented component unit in the City's financial statements.

### **(2) Summary of Significant Accounting Policies**

The accompanying combined financial statements of the System have been prepared on the accrual basis of accounting. Revenues are recognized when earned and expenses recognized when incurred. Governmental Accounting Standards Board Statement 20, "Accounting and Financial Reporting for Proprietary funds and Other Government Entities that Use Proprietary Funds," provides proprietary activities with a choice of authoritative guidance issued after November 30, 1989. The System has elected to follow GASB pronouncements exclusively after that date. Other significant accounting policies are:

#### ***(a) Investments and Cash Equivalents***

Investments and cash equivalents consist principally of securities of the United States and its agencies, certificates of deposit, and repurchase agreements, and are carried at cost, which approximates market. For purposes of the combined statements of cash flows, the System



# NEW YORK CITY WATER AND SEWER SYSTEM

## Notes to Combined Financial Statements

### (2) Continued

generally considers all highly liquid debt instruments purchased with a maturity of three months or less to be cash equivalents.

#### *(b) Restricted Assets*

Proceeds from the issuance of debt and monies set aside for the operation and maintenance of the System are classified as restricted by applicable bond indentures.

#### *(c) Bond Discount and Bond Issuance Costs*

Bond discount and bond issuance costs are amortized over the life of the related bond issue, using the effective yield method of amortization for bond discount and the straight-line method for bond issuance costs.

#### *(d) Utility Plant in Service*

Utility plant in service acquired through purchase or internal construction is recorded at cost net of retirements. Contributed utility plant in service is recorded at its estimated historical cost based on appraisals or other methods when historical cost information is not available, net of depreciation. Depreciation is computed using the straight-line method based upon estimated useful lives as follows:

	<u>Years</u>
Buildings	40-50
Water supply and waste water treatment systems	15-50
Water distribution and sewage collection systems	15-75
Equipment	5-35

Depreciation on contributed utility plant in service is allocated to contributed capital after the determination of net income.

Maintenance and repairs of property are charged to maintenance expense. Replacements and betterments are recorded as utility plant in service.

#### *(e) Operating Revenues*

Revenues are based on billing rates imposed by the Board based upon customers' water and sewer usage. The System records estimated unbilled revenue at its year end.

#### *(f) Deferred Revenues*

Revenues received in advance of the period to which they relate are deferred and recorded as revenue when earned.

# NEW YORK CITY WATER AND SEWER SYSTEM

## Notes to Combined Financial Statements

### (2) Continued

#### *(g) Deferred Bond Refunding Costs*

Deferred bond refunding costs represent the loss incurred in advance refundings of outstanding bonds. In accordance with the provisions of GASB Statement 23, "Accounting and Financial Reporting of Debt Reported by Proprietary Activities", gains or losses arising from debt refundings are deferred and amortized over the lesser of the remaining life of the old debt or the life of the new debt.

#### *(h) Contributed Capital*

In accordance with the lease of the System from the City to the Board, the City transferred its water and sewer-related physical assets at historical cost, net of depreciation, and all work-in-progress, at cost, to the Board at July 1, 1985. Capital improvements financed by sources other than the proceeds of Authority revenue bonds (e.g., capital grants) are recorded as additions to contributed capital.

Changes in contributed capital for the fiscal years ended June 30, 1996 and 1995 are as follows:

	<u>1996</u>	<u>1995</u>
	(in thousands)	
Contributed capital, beginning of year	\$ 5,030,356	5,150,160
Plant and equipment contributed	51,923	25,420
Depreciation allocated to contributed capital	<u>(111,379)</u>	<u>(145,224)</u>
Contributed capital, end of year	\$ <u>4,970,900</u>	<u>5,030,356</u>

#### *(i) Reclassifications*

Certain reclassifications to the 1995 figures have been made in order to conform to the 1996 combined financial statement presentation.

#### *(j) Use of Estimates*

The preparation of financial statements requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent assets and liabilities at the date of the financial statements and the reported amounts of revenues and expenses during the reporting period. Actual amounts could differ from those estimates.

# NEW YORK CITY WATER AND SEWER SYSTEM

## Notes to Combined Financial Statements

### (3) Financing Agreement

The Financing Agreement (the "Agreement") provides that the Authority will issue bonds to finance the cost of capital investment in the water and sewer system serving the City. It also sets forth the funding of the debt service costs of the Authority, operating costs of the water and sewer system, and the rental payment to the City.

### (4) Cumulative Deficit Retained Earnings

At June 30, 1996 and 1995, the Authority had a cumulative deficit of \$1,869 million and \$1,573 million, respectively, which amount is less than the \$2,165 million and \$1,992 million cumulative retained earnings of the Board at June 30, 1996 and 1995, respectively.

### (5) Utility Plant in Service

Utility plant in service at June 30, 1996 and 1995 is comprised as follows:

	<u>1996</u>	<u>1995</u>
	(in thousands)	
Buildings	\$ 5,677	5,677
Water supply and waste water treatment systems	6,151,395	5,895,366
Water distribution and sewage collection systems	4,226,525	3,975,321
Equipment	<u>93,053</u>	<u>86,055</u>
	10,476,650	9,962,419
Less accumulated depreciation	<u>3,304,184</u>	<u>3,084,337</u>
	<u>\$ 7,172,466</u>	<u>6,878,082</u>

### (6) Investments, Cash Equivalents and Cash Deposits

The Water and Sewer General Revenue Bond Resolution (the "Resolution") authorizes the investment of bond proceeds. The guidelines issued by the Office of the New York State Comptroller and the Resolution establish the criteria for permissible investments of the System. In addition, the Water Board and the Water Authority have investment guidelines approved by their respective Board of Directors. The System may invest in Federal government obligations or any subdivision or instrumentality thereof, obligations of the State of New York or any subdivision or instrumentality thereof provided that they are in the two highest rating categories of a rating agency, bankers' acceptances or certificates of deposit (CDs) issued by a New York State commercial bank with capital or surplus in excess of \$100 million, corporate securities or commercial paper rated highest by a rating agency when compared to similar-type securities, or repurchase agreements that are collateralized by obligations of the Federal government.

# NEW YORK CITY WATER AND SEWER SYSTEM

## Notes to Combined Financial Statements

### (6) Continued

Investments and deposits held by the System at June 30, 1996 and 1995 comprised:

	<u>1996</u>	<u>1995</u>
	(in thousands)	
Unrestricted cash, cash equivalents and investments (plus accrued interest)	\$ 8,033	5,290
Restricted cash, cash equivalents and investments (plus accrued interest)	<u>947,875</u>	<u>792,496</u>
	<u>\$ 955,908</u>	<u>797,786</u>
This amount is comprised of:		
Carrying amount of deposits (includes CDs)	\$ 36,944	54,656
Investments (plus accrued interest)	<u>918,964</u>	<u>743,130</u>
	<u>\$ 955,908</u>	<u>797,786</u>

### *Cash Deposits*

The System's bank depositories are designated by the New York City Banking Commission consisting of the comptroller, the mayor, and the finance commissioner. Independent bank rating agencies are used in part to assess the financial soundness of each bank, and the System's banking relationships are under constant operational and credit reviews. Each bank in which the System's cash is deposited is required to have its principal office in New York State and have capital stock, surplus, and undivided earnings aggregating at least \$100 million. Additionally, no amounts can be deposited with any bank in excess of the greater of (i) 2% of its capital or (ii) the amount insured by the Federal Deposit Insurance Corporation (the "FDIC"). The System had \$34.9 million and \$55.8 million on deposit at June 30, 1996 and 1995, respectively, which were covered by Federal depository insurance or collateralized with securities held by the pledging financial institution's trust department, which are not in the System's name.

### *Investments*

The System's investments are categorized to give an indication of the level of risk assumed by the System at year end. Category 1, the lowest risk, includes investments that are insured or registered, or for which the securities are held by the System or its agent in the System's name. Category 2 includes uninsured and unregistered investments for which the securities are held by the counterparty's trust department or agent in the System's name. Category 3, the highest risk, includes uninsured and unregistered investments for which the securities are held by the counterparty, or by its trust department or agent but not in the System's name.

# NEW YORK CITY WATER AND SEWER SYSTEM

## Notes to Combined Financial Statements

### (6) Continued

Investments (inclusive of certain investments reported as cash equivalents) held by the System at June 30, 1996 and 1995 were all classified as Category 1 investments, and are comprised of:

	1996*		1995*	
	Cost	Market Value	Cost	Market Value
	(in thousands)			
U.S. Treasury securities	\$ 481,990	480,445	495,861	506,987
Federal agency issues	366,934	365,101	160,017	160,021
Commercial paper	526	529	0	0
Repurchase agreements	62,725	62,725	78,787	78,787
	\$ 912,175	908,800	734,665	745,795

\* Includes \$444,252 at cost and \$443,683 at market (1996) and, \$246,024 at cost and \$244,608 at market (1995) of investments reported as cash equivalents.

### (7) Lease Agreement

The Board is party to a long-term lease (the "Lease") with the City, which transfers all the water and sewer related real and personal property to the Board for the term of the lease. The lease term commenced on July 1, 1985 and continues until the later of the fortieth anniversary of the commencement of the lease or the date on which all bonds, notes or other obligations of the Authority are paid in full or provisions for such payment have been made pursuant to the applicable debt instrument. The lease provides for payments to the City to cover the following:

- (a) an amount sufficient to pay the cost of administration, maintenance, repair and operation of the leased property, which includes overhead costs incurred by the City attributable to the leased property, net of the amount of any Federal, State, or other operating grants received by the City;
- (b) an amount sufficient to reimburse the City for capital costs incurred by the City for the construction of capital improvements to the leased property which are not paid or reimbursed from any other source, to the extent requested by the City;
- (c) an amount sufficient to pay the cost of billing and other services provided by the City;
- (d) an amount sufficient to pay the cost of legal services provided by the City;
- (e) an amount sufficient to reimburse the City for the costs of the services of any city officer and employee provided on a full-time or part-time basis to the Board; and

# NEW YORK CITY WATER AND SEWER SYSTEM

## Notes to Combined Financial Statements

### (7) Continued

(f) the amount of any reconciliation payments, as defined.

In addition to the payments described above, the Board pays rent to the City to the extent requested by the City in each fiscal year in an amount not to exceed the greater of (a) the principal and interest payable on general obligation bonds issued by the City for water and sewer purposes certified by the City to be paid within such fiscal year or (b) 15% of principal and interest payable on the bonds of the Authority to be paid within such fiscal year. After all amounts certified by the City have been paid and all other required payments have been made, any surplus funds received by the Board in the current fiscal year are to be placed into the Board's general account in the operating and maintenance reserve fund.

A summary of operation and maintenance expenses at June 30, 1996 and 1995 is as follows:

	<u>1996</u>	<u>1995</u>
	(in thousands)	
Water transmission and distribution	\$186,231	183,552
Sewer collection systems	290,119	304,765
Customer accounting	3,877	5,816
City agency support cost	34,524	34,133
Fringe benefits	53,793	55,474
Judgments and claims	<u>1,384</u>	<u>853</u>
	569,928	584,593
Rental payments to the City	<u>161,035</u>	<u>153,968</u>
	<u>\$730,963</u>	<u>738,561</u>

### (8) Payable to and Receivable from the City

As of June 30, 1996 and 1995, all construction work-in-progress recorded by the System, which has not been reimbursed to the City, has been recorded as a payable to the City, net of the amount of any State or Federal capital grants received by the City. As of June 30, 1996 and 1995, the System has a receivable for overpayment of operations and maintenance expenses.

### (9) Bonds and Notes Payable

The Authority issues revenue bonds to finance a portion of the costs of the capital renovation and improvements program to the System, to fund certain reserves, to pay costs of issuance and to advance refund certain outstanding principal amounts of bonds.

# NEW YORK CITY WATER AND SEWER SYSTEM

## Notes to Combined Financial Statements

### (9) Continued

Bonds, notes payable, and commercial paper comprise the following for the year ended June 30, 1996:

	<u>Balance at Jun.30,1995</u>	<u>Issued</u>	<u>Retired</u>	<u>Balance at Jun.30,1996</u>
1987 Fiscal Series A - 5.00% to 7.00% Serial and Term Bonds maturing in varying installments through 2017	81,130	-	6,490	74,640
1987 Fiscal Series B - 5.00% to 7.90% Serial, and Capital Appreciation Bonds maturing in varying install- ments through 2017	19,435	-	6,180	13,255
1989 Fiscal Series A - 6.60% to 7.70% Serial, Term, and Capital Appreciation Bonds maturing in varying install- ments through 2018	20,195	-	12,070	8,125
1989 Fiscal Series B - 5.75% to 7.50% Serial, Term, and Capital Appreciation Bonds maturing in varying install- ments through 2013	124,880	-	24,455	100,425
1990 Fiscal Series A - 6.00% to 7.375% Serial, Term, and Capital Appreciation Bonds maturing in varying install- ments through 2019	191,400	-	20,915	170,485
1990 Fiscal Series B - 6.70% to 7.60% Serial and Term Bonds maturing in varying installments through 2020	160,670	-	4,865	155,805
1991 Fiscal Series A - 6.00% to 7.50% Serial, Term and Capital Appreciation Bonds maturing in varying installments through 2020	35,390	-	2,120	33,270
1991 Fiscal Series B - 6.00% to 7.25% Serial and Term Bonds maturing in varying installments through 2012	287,950	-	9,525	278,425
1992 Fiscal Series A - 5.30% to 7.10% Serial and Term Bonds maturing in varying installments through 2021	472,010	-	108,405	363,605
1992 Fiscal Series B - 5.20% to 6.875% Serial and Term Bonds maturing in varying installments through 2014	308,944	-	9,975	298,969

# NEW YORK CITY WATER AND SEWER SYSTEM

## Notes to Combined Financial Statements

### (9) Continued

	<u>Balance at Jun.30,1995</u>	<u>Issued</u>	<u>Retired</u>	<u>Balance at Jun.30,1996</u>
1992 Fiscal Series C - 6.20% and 6.50% Term Bonds maturing June 15, 2021	184,900	-	-	184,900
1993 Fiscal Series A - 3.10% to 6.15% Serial, Term, and Capital Apprecia- tion Bonds maturing in varying installments through 2020	1,106,510	-	12,420	1,094,090
1993 Fiscal Series B - 6.50% and 6.375% Term Bonds maturing 2020 and 2022	93,000	-	-	93,000
1993 Fiscal Series C - Adjustable rate Term Bonds maturing 2022	100,000	-	-	100,000
1994 Fiscal Series 1 - 3.00% to 6.00% Serial and Term Bonds maturing in varying installments through 2015	676,292	-	31,368	644,924
1994 Fiscal Series B - 4.625% to 5.40% Fixed Rate Bonds maturing in varying installments through 2008	659,025	-	-	659,025
1994 Fiscal Series C - Adjustable Rate term bonds maturing in varying installments through 2003	200,000	-	-	200,000
1994 Fiscal Series D - 2.78%. Auction Rate Bonds maturing in varying installments through 2013	83,500	-	-	83,500
1994 Fiscal Series E - 7.62% to 7.92% Inverse Rate Bonds, maturing in varying installments through 2013	83,500	-	-	83,500
1994 Fiscal Series F - 4.75% to 6.00% Serial Bonds maturing in varying installments through 2021	223,150	-	-	223,150
1994 Fiscal Series G - 5.50% to 5.678% Adjustable, Auction and Leveraged Reverse Rate Bonds maturing in varying installments through 2024	205,000	-	-	205,000
1995 Fiscal Series A - Adjustable Rate Term Bonds Maturing in varying installments through 2025	216,700	-	-	216,700
1995 Fiscal Series 1 - 5.25% to 6.875% Serial and Term Bonds maturing in varying installments through 2016	116,873	-	3,190	113,683



**NEW YORK CITY WATER AND SEWER SYSTEM**

Notes to Combined Financial Statements

**(9) Continued**

	<u>Balance at</u> <u>Jun.30,1995</u>	<u>Issued</u>	<u>Retired</u>	<u>Balance at</u> <u>Jun.30,1996</u>
1996 Fiscal Series 1 - 4.3% to 6.00% Serial Bonds maturing in varying installments through 2017	-	114,585	1,480	113,105
1996 Fiscal Series 2 - 2.95% to 5.20% Serial Bonds maturing in varying installments through 2017	-	28,895	120	28,775
1996 Fiscal Series 3 - 3.60% to 5.85% Serial Bonds maturing in varying installments through 2015	-	43,715	-	43,715
1996 Fiscal Series A - 4.1% to 6.00% Serial Bonds maturing in varying installments through 2009	-	485,420	1,125	484,295
1996 Fiscal Series B - 5.75% to 6.25% Serial Bonds maturing in varying installments through 2026	-	579,670	-	579,670
1996 Fiscal Series C - 4.2% to 5.75% Serial Bonds maturing in varying installments through 2012	-	78,450	-	78,450
Commercial Paper Series 1 - Variable Rate, Short-term Rolling Maturity Backed by L.O.C.	200,000	-	40,900	159,100
Commercial Paper Series 3 - Variable Rate, Short-term Rolling Maturity Backed by L.O.C.	100,000	-	-	100,000
Commercial Paper Series 4 - Variable Rate, Short-term Rolling Maturity Backed by L.O.C.	<u>100,000</u>	<u>-</u>	<u>-</u>	<u>100,000</u>
 Total debt payable	 6,050,454	 1,330,735	 295,603	 7,085,586
 Current portion of bonds and notes payable	 <u>503,898</u>	 <u>7,785</u>	 <u>41,119</u>	 <u>470,564</u>
 Bonds and notes payable, less current portion	 <u>5,546,556</u>	 <u>1,322,950</u>	 <u>254,484</u>	 <u>6,615,022</u>

# NEW YORK CITY WATER AND SEWER SYSTEM

## Notes to Combined Financial Statements

### **(9) Continued**

With respect to all series, the Board has agreed to maintain rates and charges to provide revenues at levels sufficient to pay principal and interest requirements. All series are special obligations of the Authority payable solely from and secured by a pledge of and lien on the gross revenue of the System, as defined.

Certain bonds issued by the Authority involve the concurrent issuance of long-term variable rate securities that are matched with long-term floating rate securities. These obligations, taken together as a whole, yield a fixed rate of interest at all times. These securities have been issued to achieve a lower prevailing fixed rate of interest in relation to traditional fixed rate bonds.

The proceeds from 1996 Series A bond issue for advance refunding were used to purchase United States Treasury Certificates of Indebtedness and Notes and State and Local Government Securities, which were deposited in an irrevocable trust with an escrow agent to provide for all future debt service payments on the refunded Water and Sewer Revenue Term Bonds noted above. As a result, the advance refundings of these term bonds met the requirements of an in-substance debt defeasance, and liability for those bonds has been removed from the combined balance sheets.

Although the advance refundings resulted in the recognition of accounting losses of \$13.7 million for the year ended June 30, 1996 the Authority in effect reduced its aggregate debt service payments by approximately \$5.6 million over the next 14 years and obtained economic benefits (difference between the present values of the old and new debt service payments) of \$4.0 million in 1996. The accounting loss is deferred in accordance with GASB Statement 23, "Accounting and Financial Reporting for Refundings of Debt Reported by Proprietary Activities", and will be amortized as a component of interest expense over the remaining life of the old debt.

In prior fiscal years the Authority defeased \$1.3 billion of outstanding bonds, respectively, by placing proceeds of refunding bonds issued in an irrevocable escrow account to provide for all future debt service payments. Proceeds were used to purchase U.S. Government Securities that were placed in the irrevocable escrow account. The investments and fixed earnings from the investments are sufficient to fully service the defeased debt until the debt is called or matured. Accordingly, the escrow account assets and liability for the defeased bonds are not included in the Authority's financial statements.

As of June 30, 1996, \$674.5 million of the defeased bonds had been retired from the assets of the escrow accounts.

# NEW YORK CITY WATER AND SEWER SYSTEM

## Notes to Combined Financial Statements

### (9) Continued

Debt service requirements to maturity at June 30, 1996 are as follows:

<u>Year ending June 30</u>	<u>Principal</u>	<u>Interest</u> (in thousands)	<u>Total</u>
1997	\$ 470,564	354,304	824,868
1998	119,432	343,821	463,253
1999	120,556	336,852	457,408
2000	134,820	331,476	466,296
2001	142,429	325,011	467,440
Thereafter until 2026	<u>6,097,785</u>	<u>4,630,572</u>	<u>10,728,357</u>
Total	<u>\$ 7,085,586</u>	<u>6,322,036</u>	<u>13,407,622</u>

### (10) Restricted Assets

Certain cash and investments, plus accrued interest, of the System are restricted as follows:

<u>The Board</u>	<u>1996</u>	<u>1995</u>
	(in thousands)	
Operation and maintenance reserve account	\$ 102,752	101,242
Operation and maintenance reserve general account	<u>19,831</u>	<u>44,529</u>
	<u>122,583</u>	<u>145,771</u>
<u>The Authority</u>		
Revenue fund	53,682	49,126
Arbitrage rebate fund	531	501
Debt service reserve fund	500,608	403,094
Debt service fund	562	3,777
Construction fund	269,740	182,633
Surplus fund	<u>169</u>	<u>7,594</u>
	<u>825,292</u>	<u>646,725</u>
	<u>\$ 947,875</u>	<u>792,496</u>

The operation and maintenance reserve account is established as a depository to hold the operations and maintenance reserve fund as required by the General Bond Resolution. It is required to hold one-sixth of the operating expenses as set forth in the annual budget. It is funded through the cash receipts of the Board. The operation and maintenance reserve general account is established as a depository to hold all excess funds of the Board after all legally mandated transfers have been made. It is available to meet any deficiencies in the flow of funds including debt service and alternatively can be used as a financing source for capital expenditures.

# NEW YORK CITY WATER AND SEWER SYSTEM

## Notes to Combined Financial Statements

### **(10) Continued**

The revenue fund is established as a depository to fund the debt service, construction and arbitrage funds. It is funded through the cash transfers from the New York City Water Board. The debt service reserve fund is established as a depository to hold the maximum annual debt service requirement for the next current or any future fiscal year. It is funded through revenue bond proceeds. The debt service fund is established as a depository to pay all principal and interest payments on the Authority's debt for the current fiscal year. It is funded through the revenue fund. The construction fund is established as a depository to pay all capital construction costs incurred by the Authority. It is funded through the revenue fund and the proceeds of bond and note sales. The arbitrage rebate fund is established to provide for arbitrage rebate payments to the U.S. Department of Treasury. It is funded through the revenue fund and the debt service reserve fund.

### **(11) Commitments and Contingencies**

#### *Construction*

The System has contractual commitments of approximately \$1.9 billion at June 30, 1996 for water and sewer projects.

#### *Contingencies*

##### Claims and Litigation

In accordance with the lease, the Board is required to reimburse the City for any judgment or settlement paid by the City arising out of a tort claim to the extent that the City's liability is related to capital improvements and the operation or maintenance of the System. However, in no event shall the payment made to the City, in any fiscal year, exceed an amount equal to 5% of the aggregate revenues shown on the last year-end audited financial statements of the System. In addition, the System is required to reimburse the City, to the extent requested by the City, for the payment of any judgment or settlement arising out of a contract claim with respect to the construction of capital improvements. In addition, the City has agreed, subject to certain conditions, to indemnify the Authority and the Board against any and all liability in connection with any act done or omitted in the exercise of their powers which is taken or omitted in good faith in pursuance of their purposes under the Act.

Currently, the City is a defendant in a significant number of lawsuits pertaining to the System. The litigation includes, but is not limited to, actions commenced and claims asserted against the City arising out of alleged torts, alleged breaches of contract, condemnation proceedings and other alleged violations of law. As of June 30, 1996, the potential future liability attributable to the System for claims outstanding against the City was estimated to be \$44 million. This amount is included in the City's General Long-Term Obligations Account Group. The potential future liability is the City's best estimate based on available information. The estimate may be revised as further information is obtained and as pending cases are litigated.

# NEW YORK CITY WATER AND SEWER SYSTEM

## Notes to Combined Financial Statements

### (11) Continued

#### *Arbitrage Rebate*

In order to maintain the exemption from Federal income tax of interest on bonds issued subsequent to January 1, 1986, the System will fund amounts required to be rebated to the Federal Government pursuant to Section 148 of the Internal Revenue Code of 1986, as amended ("Code"). The Code requires the payment to the United States Treasury of the excess of the amount earned on all non-purpose obligations over the amount that would have been earned if the gross proceeds of the issue were invested at a rate equal to the yield on the issue, together with any earnings attributable to such excess. Construction funds, debt service funds or any other funds or accounts funded with proceeds of such bonds, including earnings, or pledged to or expected to be used to pay interest on such bonds are subject to this requirement. Issues with respect to which all gross proceeds are expended for the governmental purpose of the issue within six months after the date of issue and debt service funds with annual gross earnings of less than \$100,000 are exempt from this requirement. Payment is to be made after the end of the fifth bond year and after every fifth bond year thereafter, and within 60 days after retirement of the bonds. At June 30, 1996, the System has not accrued for any such liability. However, the System believes the amounts, if any, to be rebated will not significantly effect the accompanying combined financial statements.

### (12) Jamaica Water Supply Company Acquisition

On May 28, 1996, the City acquired by condemnation a portion of the assets of the Jamaica Water Supply Company at a price of \$154.7 million, representing utility plant in service of \$145.9 and accounts receivable of \$8.8. Such amounts are included in the respective accounts of the System at June 30, 1996.

### (13) System Acquisition

The City's 1997 Capital Budget includes a plan for the Board to acquire title to the System's fixed assets for approximately \$2.3 billion. The Comptroller of the City has opposed the transaction and the Comptroller's position has been upheld in two decisions. A motion to appeal to the Court of Appeals has been granted.

### (14) Subsequent Events

On September 10, 1996, the City and the State announced a watershed agreement with the communities in the Catskill, Delaware and Croton watersheds, USEPA and several environmental groups. The estimated cost to the System of this proposed watershed agreement is approximately \$400 million.

On October 8, 1996, the Authority offered to sell fiscal 1997 Series A Water and Sewer System revenue bonds in the aggregate principal amount of \$365.1 million to advance refund revenue bonds and commercial paper, to pay certain costs of issuance and to fund certain reserves. The closing for the transaction is scheduled to take place on October 29, 1996.

## NEW YORK CITY WATER AND SEWER SYSTEM

Combined Schedule of Cash Receipts and Disbursements  
 Years ended June 30, 1996 and 1995  
 (in thousands)

	<u>1996</u>	<u>1995</u>
Cash receipts:		
Water supply and distribution and sewer collection and treatment	\$ 1,087,031	989,103
Other operating revenues	36,023	46,588
Revenues received in advance	25,834	31,465
Investment income	68,465	57,034
Subsidy income	33,646	34,768
Other	-	7,750
	<u>1,250,999</u>	<u>1,166,708</u>
Cash disbursements:		
Operation and maintenance	757,292	713,984
Administration and general	14,628	14,064
Interest payments	344,845	314,145
Retainage	281	-
Amounts refunded to customers	4,973	23,688
Other	9,776	1,351
	<u>1,131,795</u>	<u>1,067,232</u>
Total cash disbursements		
Excess of cash receipts over cash disbursements before financing uses	<u>119,204</u>	<u>99,476</u>
Financing sources (uses):		
Proceeds from bond and note sales, net of issuance costs	1,696,451	1,505,595
Investments	(136,780)	159,213
Construction payments	(923,736)	(636,382)
Repayment of bonds and notes	(745,657)	(1,132,353)
Cost of bond defeasance	(6,665)	-
	<u>(116,387)</u>	<u>(103,927)</u>
Total financing uses		
Excess (deficit) of cash receipts over cash disbursements	2,817	(4,451)
Unrestricted cash and cash equivalents at beginning of year	<u>3,686</u>	<u>8,137</u>
Unrestricted cash and cash equivalents at end of year	<u>\$ 6,503</u>	<u>3,686</u>

See accompanying independent auditors' report.

## NEW YORK CITY WATER AND SEWER SYSTEM

Combining Balance Sheet  
June 30, 1996  
(in thousands)

	New York City			Total
	Water Board	Municipal Water Finance Authority	Eliminations	
<b>Assets:</b>				
Utility plant in service, less accumulated depreciation of \$ 3,304,184	\$ 7,172,466	-	-	7,172,466
Construction work-in-progress	3,638,283	-	-	3,638,283
	<u>10,810,749</u>	<u>-</u>	<u>-</u>	<u>10,810,749</u>
<b>Current assets:</b>				
Unrestricted cash and cash equivalents	6,498	5	-	6,503
Investments	1,512	-	-	1,512
Accounts receivable:				
Billed, less allowance for uncollectible water and sewer receivables of \$272,001	274,480	-	-	274,480
Unbilled	80,367	-	-	80,367
Receivable from the City	28,329	-	-	28,329
Accrued interest receivable	18	-	-	18
Total current assets	<u>391,204</u>	<u>5</u>	<u>-</u>	<u>391,209</u>
<b>Restricted assets:</b>				
Cash and cash equivalents	73,002	401,691	-	474,693
Investments	47,964	418,447	-	466,411
Accrued interest receivable	1,617	5,154	-	6,771
Total restricted assets	<u>122,583</u>	<u>825,292</u>	<u>-</u>	<u>947,875</u>
Revenue requirement to be billed by and received from the Board	-	4,124,356	(4,124,356)	-
Deferred bond and financing expenses	-	105,213	-	105,213
Total assets	<u>\$ 11,324,536</u>	<u>5,054,866</u>	<u>(4,124,356)</u>	<u>12,255,046</u>
<b>Liabilities and Equity:</b>				
Long-term liabilities:				
Bonds and notes payable, less current portion	\$ -	6,615,022	-	6,615,022
Net discount on bonds and notes payable	-	(298,314)	-	(298,314)
Deferred bond refunding costs	-	(128,029)	-	(128,029)
Revenue requirements payable to the Authority	4,124,356	-	(4,124,356)	-
Total long-term liabilities	<u>4,124,356</u>	<u>6,188,679</u>	<u>(4,124,356)</u>	<u>6,188,679</u>
Current liabilities:				
Accounts payable and accrued expenses	1,018	36,302	-	37,320
Revenues received in advance	58,353	-	-	58,353
Current portion of bonds and notes payable	-	470,564	-	470,564
Payable to the City	-	228,259	-	228,259
Refunds payable to customers	5,000	-	-	5,000
Total current liabilities	<u>64,371</u>	<u>735,125</u>	<u>-</u>	<u>799,496</u>
Total liabilities	<u>4,188,727</u>	<u>6,923,804</u>	<u>(4,124,356)</u>	<u>6,988,175</u>
Equity:				
Contributed capital, net of allocated depreciation	4,970,900	-	-	4,970,900
Retained earnings (deficit)	2,164,909	(1,868,938)	-	295,971
Total equity	<u>7,135,809</u>	<u>(1,868,938)</u>	<u>-</u>	<u>5,266,871</u>
Commitments and contingencies				
Total liabilities and equity	<u>\$ 11,324,536</u>	<u>5,054,866</u>	<u>(4,124,356)</u>	<u>12,255,046</u>

See accompanying independent auditors' report.

## NEW YORK CITY WATER AND SEWER SYSTEM

Combining Balance Sheet  
June 30, 1995  
(in thousands)

	New York City			Total
	Water Board	Municipal Water Finance Authority	Eliminations	
<b>Assets:</b>				
Utility plant in service, less accumulated depreciation of \$3,084,337	\$ 6,878,082	-	-	6,878,082
Construction work-in-progress	3,182,645	-	-	3,182,645
	<u>10,060,727</u>	<u>-</u>	<u>-</u>	<u>10,060,727</u>
<b>Current assets</b>				
Unrestricted cash and cash equivalents	3,686	-	-	3,686
Investments	1,570	-	-	1,570
Accounts receivable:				
Billed, less allowance for uncollectible water and sewer receivables of \$135,042	409,665	-	-	409,665
Unbilled	74,981	-	-	74,981
Receivable from the City	2,758	-	-	2,758
Accrued interest receivable	34	-	-	34
Total current assets	<u>492,694</u>	<u>-</u>	<u>-</u>	<u>492,694</u>
<b>Restricted assets:</b>				
Cash and cash equivalents	95,246	203,718	-	298,964
Investments	49,073	437,998	-	487,071
Accrued interest receivable	1,452	5,009	-	6,461
Total restricted assets	<u>145,771</u>	<u>646,725</u>	<u>-</u>	<u>792,496</u>
Revenue requirement to be billed by and received from the Board	-	3,591,509	(3,591,509)	-
Deferred bond and financing expenses	-	92,676	-	92,676
Total assets	<u>\$ 10,699,192</u>	<u>4,330,910</u>	<u>(3,591,509)</u>	<u>11,438,593</u>
<b>Liabilities and Equity:</b>				
<b>Long-term liabilities:</b>				
Bonds and notes payable, less current portion	\$ -	5,546,556	-	5,546,556
Net discount on bonds and notes payable	-	(255,845)	-	(255,845)
Deferred bond refunding costs	-	(128,997)	-	(128,997)
Revenue requirements payable to the Authority	3,591,509	-	(3,591,509)	-
Total long-term liabilities	<u>3,591,509</u>	<u>5,161,714</u>	<u>(3,591,509)</u>	<u>5,161,714</u>
<b>Current liabilities:</b>				
Accounts payable and accrued expenses	10,733	16,108	-	26,841
Revenues received in advance	70,538	-	-	70,538
Current portion of bonds and notes payable	-	503,898	-	503,898
Payable to the City	-	222,330	-	222,330
Refunds payable to customers	4,325	-	-	4,325
Total current liabilities	<u>85,596</u>	<u>742,336</u>	<u>-</u>	<u>827,932</u>
Total liabilities	<u>3,677,105</u>	<u>5,904,050</u>	<u>(3,591,509)</u>	<u>5,989,646</u>
<b>Equity:</b>				
Contributed capital, net of allocated depreciation	5,030,356	-	-	5,030,356
Retained earnings (deficit)	1,991,731	(1,573,140)	-	418,591
Total equity	<u>7,022,087</u>	<u>(1,573,140)</u>	<u>-</u>	<u>5,448,947</u>
Commitments and contingencies				
Total liabilities and equity	<u>\$ 10,699,192</u>	<u>4,330,910</u>	<u>(3,591,509)</u>	<u>11,438,593</u>

See accompanying independent auditors' report.



## NEW YORK CITY WATER AND SEWER SYSTEM

Combining Statements of Revenues, Expenses  
and Changes in Retained Earnings  
Year ended June 30, 1996  
(in thousands)

	<u>New York City</u>			<u>Total</u>
	<u>Water Board</u>	<u>Municipal Water Finance Authority</u>	<u>Elimi- nations</u>	
Operating revenues:				
Water supply and distribution	\$ 532,171	-	-	532,171
Sewer collection and treatment	765,808	-	-	765,808
Other operating revenues	<u>35,134</u>	<u>37,117</u>	<u>-</u>	<u>72,251</u>
Total operating revenues	<u>1,333,113</u>	<u>37,117</u>	<u>-</u>	<u>1,370,230</u>
Operating expenses:				
Operation and maintenance	730,963	-	-	730,963
Provision for bad debts	317,051	-	-	317,051
Administration and general	<u>5,135</u>	<u>9,355</u>	<u>-</u>	<u>14,490</u>
Total operating expenses	<u>1,053,149</u>	<u>9,355</u>	<u>-</u>	<u>1,062,504</u>
Excess of operating revenues over operating expenses before depreciation and amortization	279,964	27,762	-	307,726
Depreciation and amortization	<u>223,866</u>	<u>17,083</u>	<u>-</u>	<u>240,949</u>
Operating income	56,098	10,679	-	66,777
Nonoperating revenue (expenses):				
Interest expense	-	(368,422)	-	(368,422)
Investment income	<u>5,701</u>	<u>61,945</u>	<u>-</u>	<u>67,646</u>
Net income (loss)	61,799	(295,798)	-	(233,999)
Retained earnings (deficit) at beginning of year	1,991,731	(1,573,140)	-	418,591
Depreciation allocated to contributed capital	<u>111,379</u>	<u>-</u>	<u>-</u>	<u>111,379</u>
Retained earnings (deficit) at end of year	<u>\$ 2,164,909</u>	<u>(1,868,938)</u>	<u>-</u>	<u>295,971</u>

See accompanying independent auditors' report.

## NEW YORK CITY WATER AND SEWER SYSTEM

Combining Statements of Revenues, Expenses  
and Changes in Retained Earnings  
Year ended June 30, 1995  
(in thousands)

	<u>New York City</u>			
	<u>Water Board</u>	<u>Municipal Water Finance Authority</u>	<u>Elimi- nations</u>	<u>Total</u>
Operating revenues:				
Water supply and distribution	\$ 504,596	-	-	504,596
Sewer collection and treatment	717,533	-	-	717,533
Other operating revenues	43,558	34,768	-	78,326
	<u>1,265,687</u>	<u>34,768</u>	<u>-</u>	<u>1,300,455</u>
Total operating revenues				
Operating expenses:				
Operation and maintenance	738,561	-	-	738,561
Provision for bad debts	95,989	-	-	95,989
Administration and general	7,431	7,616	-	15,047
	<u>841,981</u>	<u>7,616</u>	<u>-</u>	<u>849,597</u>
Total operating expenses				
Excess of operating revenues over operating expenses before depreciation and amortization	423,706	27,152	-	450,858
Depreciation and amortization	<u>273,116</u>	<u>10,258</u>	<u>-</u>	<u>283,374</u>
Operating income	150,590	16,894	-	167,484
Nonoperating revenue (expense):				
Interest expense	-	(338,042)	-	(338,042)
Investment income	7,861	49,650	-	57,511
	<u>158,451</u>	<u>(271,498)</u>	<u>-</u>	<u>(113,047)</u>
Net income (loss)				
Retained earnings (deficit) at beginning of year	1,688,056	(1,301,642)	-	386,414
Depreciation allocated to contributed capital	<u>145,224</u>	<u>-</u>	<u>-</u>	<u>145,224</u>
Retained earnings (deficit) at end of year	<u>\$ 1,991,731</u>	<u>(1,573,140)</u>	<u>-</u>	<u>418,591</u>

See accompanying independent auditors' report.

## NEW YORK CITY WATER AND SEWER SYSTEM

Combining Statement of Cash Flows  
Year ended June 30, 1996  
(in thousands)

	New York City		Total
	Water Board	Municipal Water Finance Authority	
Cash flows from operating activities:			
Operating income	\$ 56,098	10,679	66,777
Adjustments to reconcile operating income to net cash provided by (used in) operating activities:			
Depreciation and amortization	223,866	17,083	240,949
Provision for bad debts	317,051	-	317,051
Changes in assets and liabilities:			
(Increase) in receivables	(187,401)	(145)	(187,546)
(Increase) in receivable from the City	(25,571)	-	(25,571)
Increase in payable to the City	-	5,929	5,929
(Decrease) increase in accounts payable and accrued expenses	(9,715)	20,194	10,479
(Decrease) in revenues received in advance	(12,185)	-	(12,185)
Increase in refunds payable to customers	675	-	675
Increase in payable to the Authority (receivable from the Board)	532,847	(532,847)	-
Total adjustments	839,567	(489,786)	349,781
Net cash provided by (used in) operating activities	895,665	(479,107)	416,558
Cash flows from capital and related financing activities:			
Proceeds from issuing bonds, notes and other borrowings, net of issuance costs	-	1,696,451	1,696,451
Repayments of bonds, notes and other borrowings	-	(745,657)	(745,657)
Interest paid on bonds, notes and other borrowings	-	(344,845)	(344,845)
Net cash provided by capital and related financing activities	-	605,949	605,949
Cash flows from investing activities:			
Acquisition and construction of capital assets	(926,598)	-	(926,598)
Proceeds from sales and maturities of investments	262,875	36,941,414	37,204,289
Purchases of investments	(257,032)	(36,933,085)	(37,190,117)
Interest on investments	5,658	62,807	68,465
Net cash provided by (used in) investing activities	(915,097)	71,136	(843,961)
Net increase (decrease) in cash and cash equivalents	(19,432)	197,978	178,546
Cash and cash equivalents, beginning of year	98,932	203,718	302,650
Cash and cash equivalents, end of year	\$ 79,500	401,696	481,196

## Reconciliation of Cash and Cash Equivalents Per Statement of Cash Flows to the Balance Sheet

	Assets		
	Unrestricted	Restricted	Total
Cash and cash equivalents - beginning	\$ 3,686	298,964	302,650
Net increase	2,817	175,729	178,546
Cash and cash equivalents - ending	\$ 6,503	474,693	481,196

The following are the noncash capital and related financing activities:

- Interest expense includes the accretion of capital appreciation bonds discount in the amount of \$10,029.
- Capital expenditures in the amount of \$228,259 had been incurred but not paid at June 30, 1996.
- The Water Board received capital assets of \$51,923 in 1996 which represent contributed capital from the City.

See accompanying independent auditors' report.

## NEW YORK CITY WATER AND SEWER SYSTEM

Combining Statement of Cash Flows  
Year ended June 30, 1995  
(in thousands)

	New York City		Total
	Water Board	Municipal Water Finance Authority	
Cash flows from operating activities:			
Operating income	\$ 150,590	16,894	167,484
Adjustments to reconcile operating income to net cash provided by (used in) operating activities:			
Depreciation and amortization	273,116	10,258	283,374
Provision for bad debts	95,989	-	95,989
Changes in assets and liabilities:			
(Increase) in receivables	(199,177)	(501)	(199,678)
Decrease in receivable from the City	2,729	-	2,729
Decrease in prepaid expenses	22,720	-	22,720
(Decrease) in payable to the City	-	(133,216)	(133,216)
Increase (decrease) in accounts payable and accrued expenses	8,427	(21,556)	(13,129)
(Decrease) in revenues received in advance	(9,077)	-	(9,077)
(Decrease) in refunds payable to customers	(16,693)	-	(16,693)
Increase in payable to the Authority (receivable from the Board)	153,851	(153,851)	-
Total adjustments	331,885	(298,866)	33,019
Net cash provided by (used in) operating activities	482,475	(281,972)	200,503
Cash flows from capital and related financing activities:			
Proceeds from issuing bonds, notes and other borrowings, net of issuance costs	-	1,505,595	1,505,595
Repayments of bonds, notes and other borrowings	-	(1,132,353)	(1,132,353)
Interest paid on bonds, notes and other borrowings	-	(314,145)	(314,145)
Net cash provided by capital and related financing activities	-	59,097	59,097
Cash flows from investing activities:			
Acquisition and construction of capital assets	(509,506)	-	(509,506)
Proceeds from sales and maturities of investments	139,470	30,012,753	30,152,223
Purchases of investments	(122,503)	(29,886,893)	(30,009,396)
Interest on investments	8,006	49,651	57,657
Net cash provided by (used in) investing activities	(484,533)	175,511	(309,022)
Net decrease in cash and cash equivalents	(2,058)	(47,364)	(49,422)
Cash and cash equivalents, beginning of year	100,991	251,081	352,072
Cash and cash equivalents, end of year	\$ 98,933	203,717	302,650

## Reconciliation of Cash and Cash Equivalents Per Statement of Cash Flows to the Balance Sheet

	Assets		
	Unrestricted	Restricted	Total
Cash and cash equivalents - beginning	\$ 8,137	343,935	352,072
Net (decrease)	(4,451)	(44,971)	(49,422)
Cash and cash equivalents - ending	\$ 3,686	298,964	302,650

The following are the noncash capital and related financing activities:

- Interest expense includes the accretion of capital appreciation bonds discount in the amount of \$9,500.
- Capital expenditures in the amount of \$222,330 had been incurred but not paid at June 30, 1995.
- The Water Board received capital assets of \$25,420 in 1995 which represent contributed capital from the City.

See accompanying independent auditors' report.

## NEW YORK CITY WATER AND SEWER SYSTEM

Combining Schedule of Cash Receipts and Disbursements  
Year ended June 30, 1996  
(in thousands)

	New York City			Total
	Water Board	Municipal Water Finance Authority	Eliminations	
<b>Cash receipts:</b>				
Water supply and distribution and sewer collection and treatment	\$ 1,087,031	—	—	1,087,031
Other operating revenues	36,023	—	—	36,023
Revenues received in advance	25,834	—	—	25,834
Investment income	5,658	62,807	—	68,465
Subsidy Income	—	33,646	—	33,646
<b>Total cash receipts</b>	<b>1,154,546</b>	<b>96,453</b>	<b>—</b>	<b>1,250,999</b>
<b>Cash disbursements:</b>				
Operation and maintenance	757,292	—	—	757,292
Administration and general	5,337	9,291	—	14,628
Interest payments	—	344,845	—	344,845
Retainage	281	—	—	281
Amounts refunded to customers	4,973	—	—	4,973
Other	9,230	546	—	9,776
<b>Total cash disbursements</b>	<b>777,113</b>	<b>354,682</b>	<b>—</b>	<b>1,131,795</b>
<b>Excess (deficit) of cash receipts over cash disbursements before financing sources (uses)</b>	<b>377,433</b>	<b>(258,229)</b>	<b>—</b>	<b>119,204</b>
<b>Financing sources (uses):</b>				
Proceeds from bond and note sales, net of issuance costs	—	1,696,451	—	1,696,451
Transfers from the Board, net	—	396,817	(396,817)	—
Investments	22,196	(158,976)	—	(136,780)
Construction payments	—	(923,736)	—	(923,736)
Repayment of bonds and notes	—	(745,657)	—	(745,657)
Cost of bond defeasance	—	(6,665)	—	(6,665)
Transfers to the Authority, net	(396,817)	—	396,817	—
<b>Total financing sources (uses)</b>	<b>(374,621)</b>	<b>258,234</b>	<b>—</b>	<b>(116,387)</b>
<b>Excess of cash receipts over cash disbursements</b>	<b>2,812</b>	<b>5</b>	<b>—</b>	<b>2,817</b>
Unrestricted cash and cash equivalents at beginning of year	3,686	—	—	3,686
Unrestricted cash and cash equivalents at end of year	\$ 6,498	5	—	6,503

See accompanying independent auditors' report.

## NEW YORK CITY WATER AND SEWER SYSTEM

Combining Schedule of Cash Receipts and Disbursements  
Year ended June 30, 1995  
(in thousands)

	New York City			Total
	Water Board	Municipal Water Finance Authority	Elimi- nations	
<b>Cash receipts:</b>				
Water supply and distribution and sewer collection and treatment	\$ 989,103	-	-	989,103
Other operating revenues	46,588	-	-	46,588
Revenues received in advance	31,465	-	-	31,465
Investment income	8,021	49,013	-	57,034
Subsidy income	-	34,768	-	34,768
Other	7,750	-	-	7,750
<b>Total cash receipts</b>	<b>1,082,927</b>	<b>83,781</b>	<b>-</b>	<b>1,166,708</b>
<b>Cash disbursements:</b>				
Operation and maintenance	713,984	-	-	713,984
Administration and general	6,882	7,182	-	14,064
Interest payments	-	314,145	-	314,145
Amounts refunded to customers	23,688	-	-	23,688
Other	1,351	-	-	1,351
<b>Total cash disbursements</b>	<b>745,905</b>	<b>321,327</b>	<b>-</b>	<b>1,067,232</b>
<b>Excess (deficit) of cash receipts over cash disbursements before financing sources (uses)</b>	<b>337,022</b>	<b>(237,546)</b>	<b>-</b>	<b>99,476</b>
<b>Financing sources (uses):</b>				
Proceeds from bond and note sales, net of issuance costs	-	1,505,595	-	1,505,595
Transfers from the Board, net	-	349,315	(349,315)	-
Investments	7,869	151,344	-	159,213
Construction payments	-	(636,382)	-	(636,382)
Repayment of bonds and notes	-	(1,132,353)	-	(1,132,353)
Transfers to the Authority, net	(349,315)	-	349,315	-
<b>Total financing sources (uses)</b>	<b>(341,446)</b>	<b>237,519</b>	<b>-</b>	<b>(103,927)</b>
<b>Deficit of cash receipts over cash disbursements</b>	<b>(4,424)</b>	<b>(27)</b>	<b>-</b>	<b>(4,451)</b>
Unrestricted cash and cash equivalents at beginning of year	8,110	27	-	8,137
Unrestricted cash and cash equivalents at end of year	\$ 3,686	-	-	3,686

See accompanying independent auditors' report.

**APPENDIX E**

**FORM OF OPINION OF BOND COUNSEL**

## FORM OF OPINION OF BOND COUNSEL

, 1997

New York City Municipal  
Water Finance Authority  
75 Park Place, 6th Floor  
New York, New York 10007

Ladies and Gentlemen:

We have examined a record of proceedings relating to the issuance of \$449,525,000 aggregate principal amount of Water and Sewer System Revenue Bonds, Fiscal 1998 Series B (the "1998 Series B Bonds") by the New York City Municipal Water Finance Authority (the "Authority"), a body corporate and politic constituting a public benefit corporation of the State of New York (the "State"), created and existing under and pursuant to the Constitution and statutes of the State, including the New York City Municipal Water Finance Authority Act, being Title 2-A of Article 5 of the Public Authorities Law of the State, as amended (which, together with Section 1046 of the Public Authorities Law of the State, is herein referred to as the "Act").

The 1998 Series B Bonds are issued under and pursuant to the Act and a resolution of the Authority adopted November 14, 1985 entitled "Water and Sewer System General Revenue Bond Resolution," as supplemented to the date hereof (the "Resolution"), including by a resolution adopted September 18, 1997 entitled "Thirty-fourth Supplemental Resolution Authorizing the Issuance of \$449,525,000 Water and Sewer System Revenue Bonds, Fiscal 1998 Series B" (the "Thirty-fourth Supplemental Resolution") authorizing the 1998 Series B Bonds. Capitalized terms used herein and not otherwise defined have the respective meanings given to them in the Resolution.

Pursuant to the Act, the New York City Water Board (the "Board"), a public benefit corporation of the State, created and existing under the laws of the State, and The City of New York (the "City"), a municipal corporation of the State, have entered into a lease agreement, dated as of July 1, 1985, as amended (the "Lease"), whereby the Board has leased the New York City Water and Sewer System from the City for a term ending on the later of (a) the fortieth anniversary of the effective date of the Lease or (b) the date on which all bonds, notes or other obligations of the Authority have been paid in full or provision for such payment shall have been made in accordance with the instruments under which they were issued. Pursuant to the Act, the Authority, the Board and the City have entered into a financing agreement, dated as of July 15, 1985, as amended (the "Financing Agreement"), relating to, among other things, the financing of Water Projects.

The 1998 Series B Bonds are part of an issue of bonds of the Authority (the "Bonds") which the Authority has created under the terms of the Resolution and is authorized to issue from time to time for the purposes authorized by the Act and the Resolution, as then in effect, and without limitation as to amount except as provided in the Resolution or as may be limited by law. The 1998 Series B Bonds are being issued for the purposes set forth in the Resolution.

The Authority is authorized to issue Bonds, in addition to the 1998 Series B Bonds, only upon the terms and conditions set forth in the Resolution, and such Bonds, when issued, shall, with the 1998 Series B Bonds and with all other such Bonds theretofore issued, be entitled to the equal benefit, protection and security of the provisions, covenants and agreements of the Resolution.



The 1998 Series B Bonds are dated the date hereof and mature on June 15 in the years and in the respective principal amounts, and bear interest at the respective rates per annum, set forth below:

<u>Year</u>	<u>Principal Amount</u>	<u>Interest Rate</u>
2029	\$225,055,000	5.25 %
2030	224,470,000	5.125

Interest on the 1998 Series B Bonds is payable on June 15, 1998 and semiannually thereafter on December 15 and June 15 in each year.

The 1998 Series B Bonds are subject to redemption in the manner and upon the terms and conditions set forth in the Resolution. The 1998 Series B Bonds are issuable in the form of fully registered bonds in the denomination of \$5,000 or integral multiples thereof.

We are of the opinion that:

1. The Authority is a body corporate and politic constituting a public benefit corporation of the State, duly created and existing under the laws of the State with the right and lawful authority and power to enter into the Financing Agreement, to adopt the Resolution and the Thirty-fourth Supplemental Resolution and to issue the 1998 Series B Bonds.

2. The Resolution and the Thirty-fourth Supplemental Resolution have been duly and lawfully adopted by the Authority, are in full force and effect and are the legal, valid and binding agreements of the Authority enforceable in accordance with their terms. The Resolution and the Thirty-fourth Supplemental Resolution create the valid pledges they purport to create of the Revenues and any moneys or securities on deposit in the Funds and Accounts created thereby, subject only to the provisions of the Resolution, the Thirty-fourth Supplemental Resolution and the Financing Agreement permitting the application thereof for or to the purposes and on the terms and conditions permitted thereby, including the making of any required payments to the United States with respect to arbitrage earnings.

3. The 1998 Series B Bonds have been duly and validly authorized and issued. The 1998 Series B Bonds are valid and binding special obligations of the Authority payable as provided in the Resolution, are enforceable in accordance with their terms and the terms of the Resolution and are entitled, together with all other Bonds issued under the Resolution to the benefits of the Resolution and the Act.

4. The 1998 Series B Bonds are payable solely from the Revenues and other amounts pledged to such payment under the Resolution. The 1998 Series B Bonds are not a debt of the State, the City or the Board and neither the State, the City, the Board nor any other political subdivision of the State is liable on them.

5. The Lease and the Financing Agreement have been duly authorized, executed and delivered by the respective parties thereto and constitute valid and binding obligations of such parties, enforceable in accordance with their terms.

6. The Revenues derived from the operation of the System are the property of the Board. The Financing Agreement validly transfers the right, title and interest of the Board in the Revenues to the Authority to the extent and as provided in the Financing Agreement, subject only to the provisions of the Act, the Financing Agreement and the Resolution permitting the application thereof for or to the purposes, and on the terms and conditions, therein set forth.

7. The Internal Revenue Code of 1986 (the "Code") imposes certain requirements which must be met subsequent to the issuance and delivery of the 1998 Series B Bonds for interest thereon to be and remain excluded from gross income for Federal income tax purposes. Noncompliance with such requirements could cause the interest on the 1998 Series B Bonds to be included in gross income for Federal income tax purposes retroactive to the date of issue of the 1998 Series B Bonds. Pursuant to the Thirty-fourth Supplemental Resolution, the Authority has covenanted to maintain the exclusion from gross income of the interest on the Bonds pursuant to Section 103 of the Code and, in furtherance thereof, to comply with the Tax Certificate as to

arbitrage and the provisions of Sections 103 and 141-150 of the Internal Revenue Code of 1986, with respect to the Bonds for Federal income tax purposes and that it shall provide for any required rebate to the United States. In addition, the Authority and the New York State Environmental Facilities Corporation (the "EFC"), in connection with the expected simultaneous issuance by EFC of bonds issued to finance or refinance loans to the Authority, have mutually covenanted that they will each take such actions as may be necessary and within their control to assure that such EFC bonds continue to be obligations described in Section 103 of the Code.

Under existing law and assuming compliance with the tax covenants described herein, interest on the 1998 Series B Bonds is excluded from gross income for Federal income tax purposes under Section 103 of the Code. We are also of the opinion that such interest is not treated as a preference item in calculating the alternative minimum tax imposed under the Code with respect to individuals and corporations. Interest on the 1998 Series B Bonds is, however, included in the adjusted current earnings of certain corporations for purposes of computing the alternative minimum tax on such corporations. However, we note that a portion of the interest on 1998 Series B Bonds owned by corporations may be subject to the Federal alternative minimum tax, which is based in part on adjusted current earnings.

Interest on the 1998 Series B Bonds is exempt, under existing law, from personal income tax of the State of New York and its political subdivisions, including The City of New York.

The difference between the principal amount of the 1998 Series B Bonds (collectively, the "Discount Bonds") and the initial offering price to the public (excluding bond houses, brokers, or similar persons or organizations acting in the capacity of underwriters or wholesalers) at which price a substantial amount of Discount Bonds of the same maturity was sold constitutes original issue discount which is excluded from gross income for Federal income tax purposes to the same extent as interest on the 1998 Series B Bonds. Further, such original issue discount accrues actuarially on a constant interest rate basis over the term of each Discount Bond and the basis of each Discount Bond acquired at such initial offering price by an initial purchaser thereof will be increased by the amount of such accrued original issue discount. The accrual of original issue discount may be taken into account as an increase in the amount of tax-exempt income for purposes of determining various other tax consequences of owning the Discount Bonds, even though there will not be a corresponding cash payment.

Except as stated in the preceding paragraphs, we express no opinion as to any other Federal or state tax consequences of the ownership or disposition of the 1998 Series B Bonds. Furthermore, we express no opinion as to any Federal, state or local tax law consequences with respect to the 1998 Series B Bonds, or the interest thereon, if any action is taken with respect to the 1998 Series B Bonds or the proceeds thereof upon the advice or approval of other counsel.

We have examined an executed 1998 Series B Bond, and, in our opinion, the form of said bond and its execution are regular and proper. However, we have not verified, and express no opinion as to the accuracy of, any "CUSIP" identification number which may be printed on any of the 1998 Series B Bonds.

The above opinions are qualified to the extent that the enforceability of rights and remedies may be limited by bankruptcy, insolvency, or other laws affecting creditors' rights and the unavailability of equitable remedies.

In rendering the opinions set forth in paragraphs 5 and 6 above, we wish to advise you that we have, with your consent, relied upon the opinion of the Corporation Counsel of The City of New York dated the date hereof and addressed to you as to the validity, binding effect and enforceability of the Financing Agreement and the Lease with respect to the Board and the City.

Very truly yours,

**BOOK-ENTRY-ONLY FORM**

## BOOK-ENTRY-ONLY FORM

The Depository Trust Company ("DTC") will act as securities depository for the Fiscal 1998 B Bonds. The Fiscal 1998 B Bonds will be issued as fully-registered securities registered in the name of Cede & Co. (DTC's partnership nominee). One fully-registered bond certificate will be issued for each maturity of the Fiscal 1998 B Bonds, each in the aggregate principal amount of such maturity, and will be deposited with DTC. If, however, the aggregate principal amount of any maturity exceeds \$200 million, one certificate will be issued with respect to each \$200 million of principal amount and an additional certificate will be issued with respect to any remaining principal amount of such maturity.

DTC is a limited-purpose trust company organized under the New York Banking Law, a "banking organization" within the meaning of the New York Banking Law, a member of the Federal Reserve system, a "clearing corporation" within the meaning of the New York Uniform Commercial Code, and a "clearing agency" registered pursuant to the provisions of Section 17A of the Securities Exchange Act of 1934. DTC holds securities that its Participants deposit with DTC. DTC also facilitates the settlement among Participants of securities transactions, such as transfers and pledges, in deposited securities through electronic computerized book-entry changes in Direct Participants' accounts, thereby eliminating the need for physical movement of securities certificates. Direct Participants include securities brokers and dealers, banks, trust companies, clearing corporations, and certain other organizations ("Direct Participants"). DTC is owned by a number of its Direct Participants and by the New York Stock Exchange, Inc., the American Stock Exchange, Inc., and the National Association of Securities Dealers, Inc. Access to the DTC system is also available to others such as securities brokers and dealers, banks, and trust companies that clear through or maintain a custodial relationship with a Direct Participant, either directly or indirectly ("Indirect Participants"). The Rules applicable to DTC and its Participants are on file with the Securities and Exchange Commission.

Purchases of Fiscal 1998 B Bonds under the DTC system must be made by or through Direct Participants, which will receive a credit for the Fiscal 1998 B Bonds on DTC's records. The ownership interest of each actual purchaser of each Fiscal 1998 B Bond ("Beneficial Owner") is in turn to be recorded on the Direct and Indirect Participants' records. Beneficial Owners will not receive written confirmation from DTC of their purchase, but Beneficial Owners are expected to receive written confirmations providing details of the transaction, as well as periodic statements of their holdings, from the Direct or Indirect Participant through which the Beneficial Owner entered into the transaction. Transfers of ownership interests in the Fiscal 1998 B Bonds are to be accomplished by entries made on the books of participants acting on behalf of Beneficial Owners. Beneficial Owners will not receive certificates representing their ownership interests in Fiscal 1998 B Bonds, except in the event that use of the book-entry system for the Fiscal 1998 B Bonds is discontinued.

To facilitate subsequent transfers, all Fiscal 1998 B Bonds deposited by Direct Participants with DTC are registered in the name of DTC's partnership nominee, Cede & Co. The deposit of any series of bonds with DTC and their registration in the name of Cede & Co. effect no change in beneficial ownership. DTC has no knowledge of the actual Beneficial Owners of any Fiscal 1998 B Bonds; DTC's records reflect only the identity of the Direct Participants to whose accounts such bonds are credited, which may or may not be the Beneficial Owners. The Participants will remain responsible for keeping account of their holdings on behalf of their customers.

Conveyance of notices and other communications by DTC to Direct Participants, by Direct Participants to Indirect Participants, and by Direct Participants and Indirect Participants to Beneficial Owners will be governed by arrangements among them, subject to any statutory or regulatory requirements as may be in effect from time to time.

Redemption notices shall be sent to Cede & Co. If less than all of the Fiscal 1998 B Bonds within a maturity are being redeemed, DTC's practice is to determine by lot the amount of the interest of each Direct Participant in such maturity to be redeemed.

Neither DTC nor Cede & Co. will consent or vote with respect to Fiscal 1998 B Bonds. Under its usual procedures, DTC mails an Omnibus Proxy to the Authority as soon as possible after the record date. The Omnibus Proxy assigns Cede & Co.'s consenting or voting rights to those Direct Participants to whose accounts the Bonds are credited on the record date (identified in a listing attached to the Omnibus Proxy).

Principal, premium, if any, and interest payments on the Fiscal 1998 B Bonds, will be made to DTC. DTC's practice is to credit Direct Participants' accounts on a payment date in accordance with their respective holdings shown on DTC's records unless DTC has reason to believe that it will not receive payment on a payment date. Payments by Participants to Beneficial Owners will be governed by standing instructions and customary practices, as is the case with securities held for the accounts of customers in bearer form or registered in "street name," and will be the responsibility of such Participant and not of DTC, the Trustee, or the Authority, subject to any statutory or regulatory requirements as may be in effect from time to time. Payment of principal, premium, if any, and interest to DTC is the responsibility of the Authority or the Trustee, disbursement of such payments to Direct Participants shall be the responsibility of DTC, and disbursement of such payments to the Beneficial Owners shall be the responsibility of Direct and Indirect Participants.

DTC may discontinue providing its services as securities depository with respect to the Fiscal 1998 B Bonds at any time by giving reasonable notice to the Authority or the Trustee. Under such circumstances, in the event that a successor securities depository is not obtained, bond certificates are required to be printed and delivered.

The Authority may decide to discontinue use of the system of book-entry transfers through DTC (or a successor securities depository). In that event, bond certificates will be printed and delivered.

The information in this section concerning DTC and DTC's book-entry system has been obtained from sources that the Authority believes to be reliable, but the Authority takes no responsibility for the accuracy thereof.

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**SPECIMEN INSURANCE POLICY**

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Financial Guaranty Insurance  
Company  
115 Broadway  
New York, NY 10006  
(212) 312-3000  
(800) 352-0001



A GE Capital Company

## Municipal Bond New Issue Insurance Policy

<b>Issuer:</b>	<b>Policy Number:</b>
	<b>Control Number:</b> 0010001
<b>Bonds:</b>	<b>Premium:</b>

Financial Guaranty Insurance Company ("Financial Guaranty"), a New York stock insurance company, in consideration of the payment of the premium and subject to the terms of this Policy, hereby unconditionally and irrevocably agrees to pay to State Street Bank and Trust Company, N.A., or its successor, as its agent (the "Fiscal Agent"), for the benefit of Bondholders, that portion of the principal and interest on the above-described debt obligations (the "Bonds") which shall become Due for Payment but shall be unpaid by reason of Nonpayment by the Issuer.

Financial Guaranty will make such payments to the Fiscal Agent on the date such principal or interest becomes Due for Payment or on the Business Day next following the day on which Financial Guaranty shall have received Notice of Nonpayment, whichever is later. The Fiscal Agent will disburse to the Bondholder the face amount of principal and interest which is then Due for Payment but is unpaid by reason of Nonpayment by the Issuer but only upon receipt by the Fiscal Agent, in form reasonably satisfactory to it, of (i) evidence of the Bondholder's right to receive payment of the principal or interest Due for Payment and (ii) evidence, including any appropriate instruments of assignment, that all of the Bondholder's rights to payment of such principal or interest Due for Payment shall thereupon vest in Financial Guaranty. Upon such disbursement, Financial Guaranty shall become the owner of the Bond, appurtenant coupon or right to payment of principal or interest on such Bond and shall be fully subrogated to all of the Bondholder's rights thereunder, including the Bondholder's right to payment thereof.

This Policy is non-cancellable for any reason. The premium on this Policy is not refundable for any reason, including the payment of the Bonds prior to their maturity. This Policy does not insure against loss of any prepayment premium which may at any time be payable with respect to any Bond.

As used herein, the term "Bondholder" means, as to a particular Bond, the person other than the Issuer who, at the time of Nonpayment, is entitled under the terms of such Bond to payment thereof. "Due for Payment" means, when referring to the principal of a Bond, the stated maturity date thereof or the date on which the same shall have been duly called for mandatory sinking fund redemption and does not refer to any earlier date on which payment is due by reason of call for redemption (other than by mandatory sinking fund redemption), acceleration or other advancement of maturity and means, when referring to interest on a Bond, the stated date

Financial Guaranty Insurance  
Company  
115 Broadway  
New York, NY 10006  
(212) 312-3000  
(800) 352-0001



*A GE Capital Company*

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## **Municipal Bond New Issue Insurance Policy**

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for payment of interest. "Nonpayment" in respect of a Bond means the failure of the Issuer to have provided sufficient funds to the paying agent for payment in full of all principal and interest Due for Payment on such Bond. "Notice" means telephonic or telegraphic notice, subsequently confirmed in writing, or written notice by registered or certified mail, from a Bondholder or a paying agent for the Bonds to Financial Guaranty. "Business Day" means any day other than a Saturday, Sunday or a day on which the Fiscal Agent is authorized by law to remain closed.

In Witness Whereof, Financial Guaranty has caused this Policy to be affixed with its corporate seal and to be signed by its duly authorized officer in facsimile to become effective and binding upon Financial Guaranty by virtue of the countersignature of its duly authorized representative.

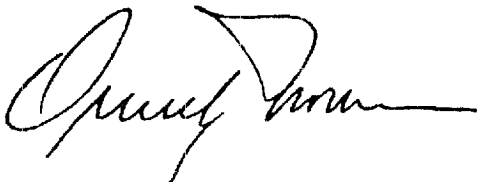
**SPECIMEN**  


**President**

**Effective Date:**

**Authorized Representative**

State Street Bank and Trust Company, N.A., acknowledges that it has agreed to perform the duties of Fiscal Agent under this Policy.



**Authorized Officer**





80872

1-2. NAME OF ISSUER AND DESCRIPTION OF ISSUE : NEW YORK CITY MUNICIPAL WATER FINANCE AUTHORITY  
WATER AND SEWER SYSTEM REVENUE BONDS,  
FISCAL 1998 SERIES B

3. STATE : NY

4. DATED DATE : 09/25/1997

5. DATE OF FINAL MATURITY OF OFFERING : 06/15/2030 6. DATE OF SALE : 09/18/1997

7. PAR VALUE OF OFFERING : \$ 449,525,000

8. PAR AMOUNT UNDERWRITTEN (if there is no underwriting syndicate): \$

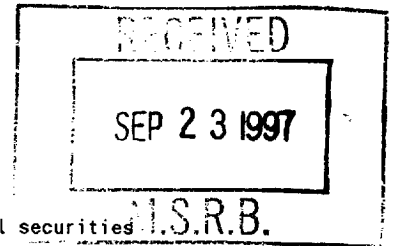
9. AMENDED OR STICKERED OS? NO NUMBER OF SERIES IN OS : 1  
(Enter Y or N) (Fill out one form for each series)

10. CHECK ALL THAT APPLY:

- a.  At the option of the holder thereof, all securities in this offering may be tendered to the issuer of such securities or its designated agent for redemption or purchase at par value of more at least as frequently as every nine months until maturity, earlier redemption, or purchase by the issuer or its designated agent.
- b.  At the option of the holder thereof, all securities in this offering may be tendered to the issuer of such securities or its designated agent for redemption or purchase at par value of more at least as frequently as every two years until maturity, earlier redemption, or purchase by the issuer or its designated agent.
- c.  This offering is exempt from SEC rule 15c2-12 under section (c)(1) of that rule. Section (c)(1) of SEC rule 15c2-12 states that an offering is exempt from the requirements of the rule if the securities offered have authorized denominations of \$100,000 or more and or sold to no more than 35 persons each of whom the participating underwriter believes: (1) has the knowledge and expertise necessary to evaluate the merits and risks of the investment; and (2) is not purchasing for more than one account, with a view toward distributing the securities.

11. MANAGING UNDERWRITER : PaineWebber Incorporated

16. CUSIP NUMBERS (and corresponding maturity dates)  
06/15/2029 64970KAD9 06/15/2030 64970KAE7



17. MSRB rule G-34 requires that CUSIP numbers be assigned to each new issue of municipal securities unless the issue is ineligible for CUSIP number assignment under the eligibility criteria of the CUSIP Service Bureau.

Check here if the issue is ineligible for CUSIP number assignment.

State the reason why the issue is ineligible for CUSIP number assignment:

18. Submit two copies of the completed form along with the official statement to: Municipal Securities Rulemaking Board, 1640 King Street, Suite 300, Alexandria, VA 22314. Incomplete submissions will be returned for correction.