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REPORT OF THE RIVER MASTER OF THE DELAWARE RIVER

FOR THE PERIOD DECEMBER 1, 2000-NOVEMBER 30, 2001

Open-File Report 2005-1204

U.S. Department of the Interior
U.S. Geological Survey

CALENDAR FOR REPORT YEAR 2001

DECEMBER 2000

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Report of the River Master of the Delaware River For the period December 1, 2000 - November 30, 2001

By Bruce E. Krejmas, Gary N. Paulachok, and William J. Carswell, Jr.

Open-File Report Report 2005-1204

U.S. Department of the Interior
U.S. Geological Survey

U.S. Department of the Interior
Gale A. Norton, Secretary

U.S. Geological Survey
P. Patrick Leahy, Acting Director

U.S. Geological Survey, Reston, Virginia: 2005

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Conversion Factors and Vertical Datum

Multiply	By	To obtain
	Length	
inch (in.)	25.4	millimeter (mm)
foot (ft)	0.3048	meter (m)
mile (mi)	1.609	kilometer (km)
	Area	
square mile (mi^2)	2.590	square kilometer (km^2)
	Volume	
million gallons (Mgal)	3,785	cubic meter (m^3)
million gallons (Mgal)	1.547	cubic foot per second day (ft^3/s)-d
billion gallons (Bgal)	3.785	cubic hectometer (hm^3)
cubic foot per second-day (ft^3/s)-d	0.002447	cubic hectometer (hm^3)
	Flow rate	
million gallons per day (Mgal/d)	1.547	cubic foot per second (ft^3/s)
million gallons per day (Mgal/d)	0.04381	cubic meter per second (m^3/s)
billion gallons per day (Bgal/d)	43.81	cubic meter per second (m^3/s)
cubic foot per second (ft^3/s)	0.02832	cubic meter per second (m^3/s)

Datum: Vertical coordinate information is referenced to the North American Vertical Datum of 1988 (NAVD 88). Horizontal coordinate information is referenced to the North American Datum of 1927 (NAD 27).

Temperature in degrees Fahrenheit (°F) may be converted to degrees Celsius (°C) as follows:
°C=(°F-32)/1.8

RIVER MASTER LETTER OF TRANSMITTAL AND SPECIAL REPORT

OFFICE OF THE DELAWARE RIVER MASTER
United States Geological Survey
415 National Center
Reston, Virginia 20192

September 1, 2005

The Honorable
William H. Rehnquist
Chief Justice of the United States

The Honorable
Ruth Ann Minner
Governor of Delaware

The Honorable
Richard J. Codey
Acting Governor of New Jersey

The Honorable
George E. Pataki
Governor of New York

The Honorable
Edward G. Rendell
Governor of Pennsylvania

The Honorable
Michael R. Bloomberg
Mayor of the City of New York

No. 5, Original.—October Term, 1950
State of New Jersey, Complainant,
v.
State of New York and City of New York, Defendants,
Commonwealth of Pennsylvania and State of Delaware, Intervenors.

Dear Sirs and Madam:

For the record and in compliance with the provisions of the Amended Decree of the Supreme Court of the United States entered June 7, 1954, I am transmitting herewith the 48th Annual Report of the River Master of the Delaware River for the 12-month period from December 1, 2000, to November 30, 2001. In this report, this period is referred to as the River Master report year or the report year.

During the 2001 River Master report year, monthly precipitation in the upper Delaware River Basin ranged from 36 percent of the long-term average during April and November 2001 to 149 percent of the long-term average during March 2001. Total precipitation during the report year was 8.33 inches less than the long-term average. Precipitation during the December to May period, when reservoirs typically refill, was 2.80 inches less than the 60-year average. Precipitation during the report year was above normal in December, March, June, and September, and below normal in the other 8 months.

On December 1, 2000, when the report year began, combined storage in the New York City reservoirs in the upper Delaware River Basin was 220.805 billion gallons (Bgal) or 81.5 percent of combined storage capacity. Median combined storage on December 1, computed on the basis of 33 years of record, is 166.770 Bgal. Operations on December 1, 2000, were being conducted as prescribed by the Decree. Storage varied little during winter but, in early April, storage increased rapidly. The reservoirs were full in April and all the reservoirs spilled. Storage declined gradually from May to July, and then more rapidly from July to November. On the basis of combined storage, the basin entered drought watch on October 29, 2001, and drought warning on November 4, 2001. On November 30, 2001, combined storage in the New York City reservoirs was 66.406 Bgal, or 24.5 percent of combined capacity. Operations in the basin were conducted at reduced levels from October 29 to November 30, 2001.

The Delaware River Master Advisory Committee met at Matamoras, Pennsylvania, on April 25, 2001, to discuss hydrologic conditions in the basin and operational procedures for the 2001 reservoir-release season. During the report year, the following individuals served as members of the Advisory Committee:

Delaware	Dr. Robert R. Jordan
New Jersey	Robert C. Shinn, Jr.
New York	N.G. Kaul
New York City	Joel A. Miele, Sr.
Pennsylvania	Irene B. Brooks

The River Master informed the Committee that, on the basis of information provided by New York City, the excess-release quantity beginning June 15 was 7.381 Bgal. On the basis of modifications to reservoir release programs in Delaware River Basin Commission (DRBC) Docket No. D-77-20 CP (Revision No. 4), the excess-release quantity was to be used for various purposes. On the basis of hydrologic conditions in early June, the Parties to the Decree unanimously agreed to release that portion of the excess-release quantity that could be released starting June 15.

During the report year, the River Master and staff participated in a number of water-supply related meetings of the Delaware River Basin Commission. The Deputy Delaware River Master met periodically with representatives of the Parties to the Decree as a non-voting member of DRBC's Flow Management Technical Advisory Committee. Issues of particular interest to the River Master involved management of reservoir releases and regulated streamflow in the upper Delaware River Basin.

The U.S. Geological Survey (USGS) continued the operation of its field office of the Delaware River Master at Milford, Pennsylvania. Gary N. Paulachok, Deputy Delaware River Master, continued in charge of the office, assisted by Bruce E. Krejmas, Hydrologist, and Heidi L. Soden, Secretary.

During the year, the USGS office at Milford continued the weekly distribution of a summary hydrologic report. These reports contain preliminary data on precipitation in the upper Delaware River Basin, releases and spills from New York City reservoirs to the Delaware River, diversions to the New York City water-supply system, reservoir contents, daily segregation of flow of the Delaware River at the Montague gaging station, and diversions by New Jersey. The reports were distributed to members of the Delaware River Master Advisory Committee and to other parties interested in Delaware River operations. A monthly summary of hydrologic conditions also was provided to Advisory Committee members.

The first section of this report documents Delaware River operations during the report year. During the year, the City of New York diverted 243.306 Bgal from the Delaware River Basin and released 125.440 Bgal from Pepacton, Cannonsville, and Neversink Reservoirs to the Delaware River. The River Master directed releases from these reservoirs to the Delaware River totaling 100.984 Bgal.

The second section of this report describes water quality at various monitor sites on the Delaware Estuary. The section includes basic data on chemical properties and physical characteristics of the water and presents summary statistics on the data.

Throughout the year, diversions to supply water to New York City and releases designed to maintain the flow of the Delaware River at Montague were made as directed by the River Master. Diversions by New York City from its reservoirs in the Delaware River Basin did not exceed the limit stipulated by the Decree. Diversions by New Jersey also were within mandated limits.

The River Master and staff are grateful for the continued cooperation and support of the Parties to the Decree. Also, the contributions of the PPL Corporation and Southern Company in informing the River Master of plans for power generation and furnishing data on reservoir releases are greatly appreciated.

A draft version of this report was furnished to the River Master Advisory Committee members for review and comment. These comments have been incorporated into this report.

Sincerely yours,

/Signed/

Stephen F. Blanchard
Delaware River Master

DELAWARE RIVER OPERATIONS

Abstract

A Decree of the United States Supreme Court in 1954 established the position of Delaware River Master. In addition, the Decree authorizes diversions of water from the Delaware River Basin and requires compensating releases from certain reservoirs, owned by New York City, to be made under the supervision and direction of the River Master. The Decree stipulates that the River Master will furnish reports to the Court, not less frequently than annually. This report is the 48th Annual Report of the River Master of the Delaware River. It covers the 2001 River Master report year, that is, the period from December 1, 2000, to November 30, 2001.

During the report year, precipitation in the upper Delaware River Basin was 8.33 inches less than the long-term average. Combined storage in Pepacton, Cannonsville, and Neversink Reservoirs was above the long-term median on December 1, 2000. Reservoir storage increased rapidly in early April 2001 and all the reservoirs filled and spilled. Storage declined steadily from early July to November. Delaware River operations were conducted as prescribed by the Decree from December 1, 2000, to October 28, 2001, and at reduced levels from October 29, 2001, to November 30, 2001, when drought watch and warning conditions prevailed.

Diversions from the Delaware River Basin by New York City and New Jersey were in compliance with the terms of the Decree or with the reduced limits in effect during drought watch and warning conditions. Reservoir releases were made as directed by the River Master at rates designed to meet the flow objective for the Delaware River at Montague, N.J., on 155 days during the report year. Releases were made at experimental conservation rates—or rates designed to relieve thermal stress and protect the fishery in the tailwaters of the reservoirs—on all other days.

During the report year, New York City and New Jersey complied fully with the terms of the Decree, and during drought watch and warning conditions, complied fully with the terms of the "Interstate Water Management Recommendations of the Parties to the Decree" (DRBC Resolution 83-13), and directives and requests of the River Master.

As part of a long-term program, the quality of water in the Delaware Estuary between Trenton, N.J., and Reedy Island Jetty, Del., was monitored at various locations. Data on water temperature, specific conductance, dissolved oxygen, and pH were collected by electronic instruments at four sites. In addition, discrete water-quality data were collected at 3 sites on a monthly basis and at 19 sites on a semimonthly basis.

Introduction

An Amended Decree of the United States Supreme Court, entered June 7, 1954, authorized diversions of water from the Delaware River Basin and provided for releases of water from certain New York City reservoirs to the Delaware River. The Decree stipulated that these diversions and releases were to be made under the supervision and direction of the Delaware River Master. The Decree also stipulated that reports on Delaware River operations be made to the Court not less frequently than annually. This report documents operations from December 1, 2000, to November 30, 2001, or the 2001 River Master report year. The report also presents information on water quality in the Delaware Estuary during the report year.

Some hydrologic data presented in this report include records of streamflow and water quality for U.S. Geological Survey (USGS) data-collection stations. These records were collected, computed, and furnished by the offices of the U.S. Geological Survey at Troy, New York; Malvern and New Cumberland, Pennsylvania; and West Trenton, New Jersey, in cooperation with the States of New York and New Jersey, the Commonwealth of Pennsylvania, and the City of New York. The locations of major streams and reservoirs, and selected streamflow-gaging stations in the Delaware River Basin are shown in figure 1.

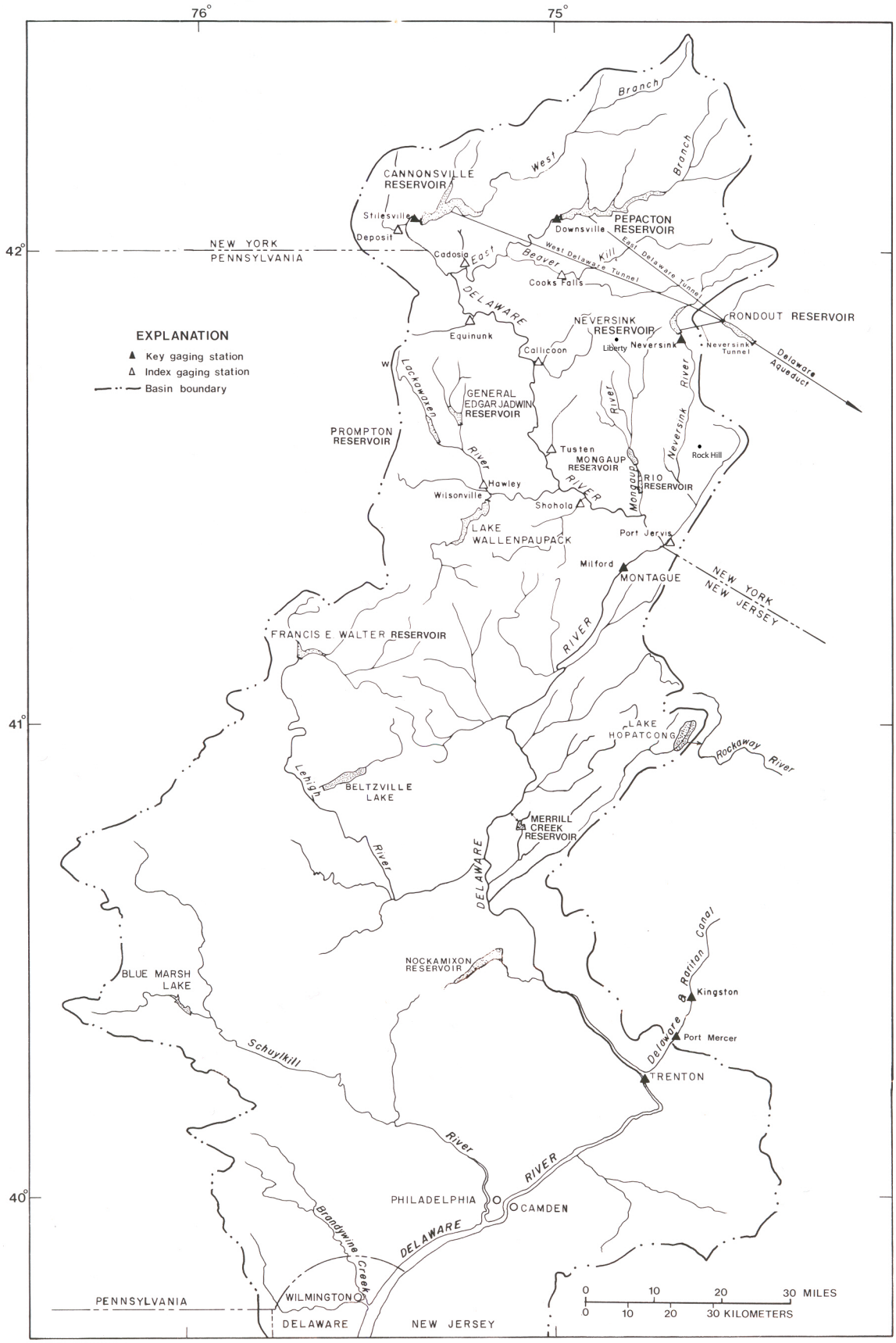

Figure 1. Delaware River Basin above Wilmington, Delaware.

Acknowledgments

The River Master's daily operation records were prepared from hydrologic data collected chiefly on a day-to-day basis. Data for these records were collected and computed by the Office of the Delaware River Master or were furnished by the following agencies and utilities: Data for Pepacton, Cannonsville, and Neversink Reservoirs by the New York City Department of Environmental Protection, Bureau of Water Supply; for Lake Wallenpaupack by the PPL Corporation; and for Rio Reservoir by Southern Company. Precipitation data and quantitative precipitation forecasts were provided by the National Weather Service.

Definition of Terms and Procedures

The following definitions apply to various terms and procedures used in the operations documented in this report. A table for converting inch-pound units to the International System of Units (SI) is given on page vi.

- **Capacity**.—Total usable volume in a reservoir between the point of maximum depletion and the elevation of the lowest crest of the spillway.
- **Conservation releases**.—Controlled releases from reservoirs designed to maintain specified flows in stream channels below the reservoirs.
- **Daily excess-release credits**.—Daily credits and deficits during the seasonal release period (June 15 to the following March 15) are computed as the arithmetic difference between the daily mean discharge of the Delaware River at Montague, N.J., and 1,750 ft^3/s. The daily credit cannot exceed the 24-hour period releases from Pepacton, Cannonsville, and Neversink Reservoirs routed to Montague and made in accordance with direction, except as follows: during the seasonal period, credits also are applied for part or all of other releases from these reservoirs that contribute to the daily mean discharge at Montague between 1,750 ft^3/s and the applicable excess-release rate.
- **Directed releases**.—Controlled releases from New York City reservoirs in the upper Delaware River Basin, designed by the Delaware River Master to meet the Montague flow objective.
- **Diversions**.—The transfer of water by New York City from Pepacton, Cannonsville, and Neversink Reservoirs in the upper Delaware River Basin through the East Delaware, West Delaware, and Neversink Tunnels, respectively, to the City's water-supply system. Also, the transfer of water by New Jersey from the Delaware River through the Delaware and Raritan Canal.
- **Excess quantity**.—As defined by the Decree, the excess quantity of water is equal to 83 percent of the amount by which the estimated consumption in New York City during the year is less than the City's estimate of continuous safe yield (1,665 Mgal/d stipulated by the 1954 Decree) from all its sources of supply obtainable without pumping, except that the excess quantity shall not exceed 70 Bgal. Each year, the seasonal period for release of the excess quantity begins on June 15. The flow objective for the period becomes effective at Montague on that date and remains in effect until the following March 15, or until the cumulative total of excess-release credits equals the seasonal quantity, whichever occurs first.
- **Index gaging station**.—A particular site on a tributary of the upper Delaware River where systematic observations of gage height and discharge are made. These stations are used mainly during the directed-release season to estimate inflows of surface water to the Delaware River.
- **Key gaging stations**.—Particular sites on the East Branch Delaware River, West Branch Delaware River, Neversink River, Delaware and Raritan Canal, and mainstem Delaware River where continuous, systematic observations of gage height and discharge are made. These stations are used on a year-round basis in River Master operations.
- **Point of maximum reservoir depletion**.—Elevation of the top of the highest outlet, sometimes referred to as minimum full-operation level.

- **Rate of flow**.—Mean discharge for a specified 24-hour period, in cubic feet per second or million gallons per day.
- **Rate of flow at Montague**.—Daily mean discharge of the Delaware River at Montague, N.J., computed on a calendar-day basis.
- **Reservoir-controlled releases**.—Controlled releases from reservoirs passed through outlet valves in the dams or through turbines in powerplants. These releases do not include spillway overflow at the reservoirs.
- **Storage or contents**.—Usable volume of water in a reservoir. Unless otherwise indicated, volume is computed on the basis of level pool and above the point of maximum depletion.
- **Time of day**.—Time of day is expressed in 24-hour Eastern Standard Time, which during the report year included a 23-hour day on April 1 and a 25-hour day on October 28.
- **Uncontrolled runoff at Montague**.—Runoff from the drainage area above Montague excluding the drainage area above Pepacton, Cannonsville, Neversink, Wallenpaupack, and Rio Dams, but including spillway overflow at these dams.

Precipitation

Precipitation in the Delaware River Basin above Montague totaled 34.93 in. for the 2001 report year and was 8.33 in. less than the long-term average, December 1940-November 2000. Monthly precipitation ranged from 36 percent of the long-term average in April and November 2001 to 149 percent of average in March 2001. Data on monthly precipitation during the report year and long-term average precipitation are presented in table 1[1]. These data were computed from records collected by the National Weather Service; the New York City Department of Environmental Protection, Bureau of Water Supply; and the River Master, at 10 geographically distributed stations.

The seasonal period from December to May typically is when surface-water and ground-water reservoirs fill. During this period in 2000-2001, total average precipitation at the 10 stations was 17.52 in., which is 86 percent of the 60-year average. During June to November, average precipitation at the 10 stations was 17.41 in., which is 76 percent of the long-term average. The maximum monthly precipitation was 7.24 in. in December 2000, measured at Liberty, New York; the minimum monthly precipitation was 0.65 in. in October 2001, measured at Rock Hill, New York (locations shown on Figure 1).

Operations

December to May

Operations on December 1, 2000, were conducted as prescribed by the Decree. The Montague flow objective was 1,810 ft^3/s, and the allowable diversions to New York City and New Jersey were 800 Mgal/d and 100 Mgal/d, respectively. Conservation releases from New York City reservoirs were made at the experimental release rates shown in table 2.

From December 2000 to May 2001, the first half of the report year, total precipitation was 2.80 in. below average. Monthly precipitation ranged from 36 percent of the long-term average in April 2001 to 149 percent in March 2001 (table 1). Runoff in the upper basin was in the normal range during February; above normal during December and April; and below normal during January, March, and May.

On December 1, 2000, when the 2001 report year began, Pepacton Reservoir contained 109.916 Bgal of water in storage above the point of maximum depletion, or 78.4 percent of the 140.190 Bgal stor-

[1]All numbered tables in the section "Delaware River Operations" are grouped at the end of this section, beginning on page 22.

age capacity. Cannonsville Reservoir contained 87.204 Bgal, or 91.1 percent of the 95.706 Bgal storage capacity. Neversink Reservoir contained 23.685 Bgal, or 67.8 percent of the 34.941 Bgal storage capacity. Combined storage in these reservoirs on December 1 was 220.805 Bgal, or 81.5 percent of combined capacity. Daily storage in Pepacton, Cannonsville, and Neversink Reservoirs is shown in tables 3, 4, and 5, respectively, and combined storage during the report year is illustrated in Figure 2.

From December to May, inflow to the City's reservoirs typically exceeds outflow and storage increases. The average inflow to Pepacton, Cannonsville, and Neversink Reservoirs for these 6 months during the 60-year period from December 1940 to May 2000 was 303.3 Bgal. During the corresponding 6 months of the current report year, inflow to the three reservoirs totaled 249.7 Bgal. Evaporation loss is not included in the computations.

Combined storage fluctuated moderately from December to March. Precipitation at the end of March, in combination with snow melt from an above-average snowpack, resulted in a storage increase to full capacity during mid-April. Combined storage decreased gradually through May. The combined storage of the reservoirs was about 93 percent of full capacity at the end of May.

Combined storage in the three New York City reservoirs was 220.704 Bgal on November 30, 2000 and 252.898 Bgal on May 31, 2001, a net increase of 32.194 Bgal or 11.9 percent of capacity. The maximum combined storage during the period from December to May was 276.596 Bgal on April 16. Typically, maximum storage in the individual reservoirs occurs on different days. Maximum storage in Pepacton

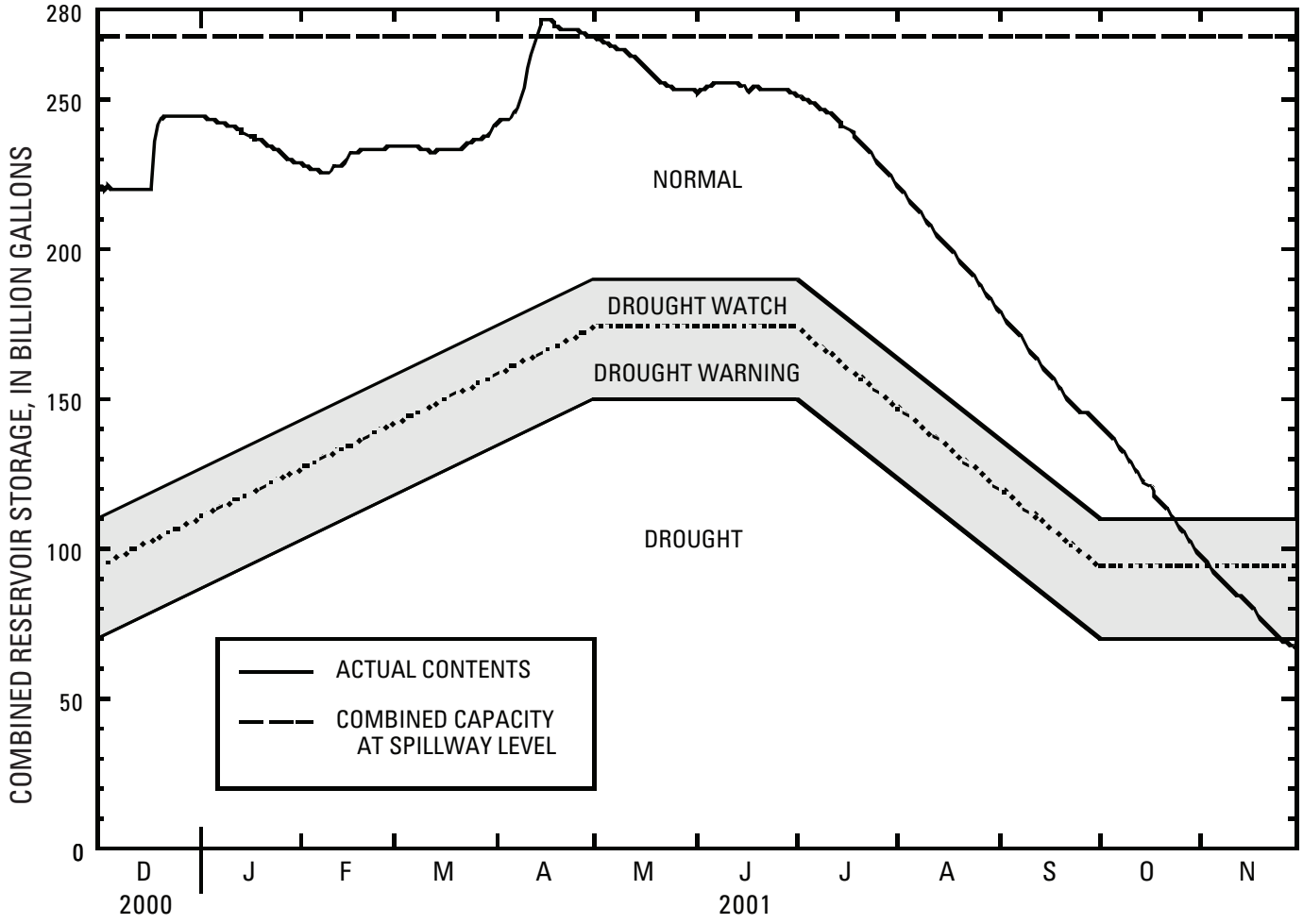

Figure 2. Operation curves and actual contents for New York City reservoirs in the Delaware River Basin, December 1, 2000 to November 30, 2001.

Reservoir during the December to May period was 141.561 Bgal on April 17; maximum storage in Cannonsville Reservoir was 102.434 Bgal on April 11; and maximum storage in Neversink Reservoir was 35.553 Bgal on April 10, 2001. Pepacton Reservoir spilled April 14-26, Cannonsville Reservoir spilled from December 18 to January 10 and from March 21 to May 11, and Neversink Reservoir spilled April 8-28. A total of 73.033 Bgal of water spilled from these reservoirs during the December to May period.

During the December to May period, diversions to Rondout Reservoir by New York City totaled 118.178 Bgal (649 Mgal/d). The forecasted discharge at Montague, exclusive of water released from the City reservoirs, was less than the flow objective on 10 days in May, and releases were directed. The observed daily mean discharge at Montague was less than the applicable flow objective on 5 days, but all observed flows were within 15 percent of the flow objective. Applicable design rates for the gaging station on the Delaware River at Montague, N.J. are presented in table 6.

June to November

Monthly precipitation from June to November was above average in June and September and below average in July, August, October and November. Total precipitation during the period was 17.41 in. or 5.53 in. less than the 60-year average (table 1).

Releases were directed to meet the Montague flow objective on 145 days between June 1 and November 30, 2001, when the forecasted discharge at Montague, exclusive of water released from the New York City reservoirs, was less than the flow objective. Releases at experimental conservation rates or at rates designed to protect the fishery were made at other times during the period. On the basis of River Master records, a total of 5,223 (ft^3/s)-d or 3.384 Bgal was released from May 31 to July 25 for fisheries protection in the upper Delaware River Basin.

From June 1 to June 14, the Montague flow objective was 1,750 ft^3/s (table 6). The forecasted flow, exclusive of releases from Pepacton, Cannonsville, and Neversink Reservoirs, did not fall below the flow objective and no releases were directed.

The New York City Department of Environmental Protection, Bureau of Water Supply, Quality, and Protection furnished the River Master with the following data for the 2001 calendar year, as stipulated by the Decree:

1. The estimated continuous safe yield from all the City's sources, obtainable without pumping, is 1,665 Mgal/d, or a total during calendar year 2001 of 1.665 Bgal/d x 365 days = 607.725 Bgal.
2. The estimated consumption that the City must provide for, from all its sources of supply during calendar year 2001, is 591.582 + 7.250 = 598.832 Bgal.

On the basis of the Decree and the above data, the aggregate quantity of excess-release water was 83 percent of (607.725 - 598.832), or 7.381 Bgal.

Data on water consumption by the City of New York for each calendar year since 1950, from all sources of supply, are presented in table 7.

On April 19, 2001, the reservoir release programs, described in DRBC Docket No. D-77-20 CP (Revision No. 4), were extended to April 30, 2002. A copy of the agreement extending the programs is included in this report as Appendix A. As part of these programs, 50 percent of the annual excess-release quantity was placed in a fishery-protection bank to augment releases during drought warning. The remainder of the excess-release quantity could be used to provide an increase in the Montague flow objective or could be banked in accordance with the procedures outlined in the Lower Basin Drought Management Plan.

On June 15, 2001, the beginning of the seasonal excess-release period, the Montague flow objective was increased to 1,800 ft^3/s (table 6). Storage in the New York City reservoirs declined rapidly throughout summer and fall in response to below normal runoff and above normal releases required to meet the Montague flow objective (fig. 2). Combined storage declined below the drought watch level of the operation curves on October 24, 2001, and then remained below that level for 5 consecutive days. On October 29, 2001, the Montague flow objective was reduced to 1,655 ft^3/s and the allowable diversions to New York City were reduced to 680 Mgal/d, as required by DRBC Docket No. D-77-20 CP (Revision No. 4). Combined storage continued to decline to the drought warning level on November 4, 2001, and consequently, the Montague flow objective was reduced to 1,550 ft^3/s and allowable diversions to New York City and New Jersey were reduced to 560 Mgal/d and 70 Mgal/d, respectively. Storage continued to decline and reached an emergency level on November 26, 2001. The 5-consecutive days criterion for implementing drought-emergency operations was not met before the end of the River Master year.

Between June 15 and November 30, 2001, the forecasted flow at Montague, exclusive of releases from the New York City reservoirs, was less than the flow objective on 145 days and releases were directed. On 81 days during the June 15 to November 30 period, the observed flow was less than the flow objective. On 71 of these 81 days, observed flows were within 10 percent of the flow objective. Applicable design rates for the gaging station Delaware River at Montague, N.J. are presented in table 6.

The total discharge measured at Montague, the portion derived from uncontrolled runoff from the drainage area below the reservoirs, the portion contributed by power reservoirs, and the portion contributed by Pepacton, Cannonsville, and Neversink Reservoirs from July to November are shown in Figure 3. In developing the water budget for Montague, uncontrolled runoff was computed as the residual of observed flow minus releases and spill from all reservoirs, and, therefore, was subject to errors in observations, transit times, and routing of the various components of flow. The conservation release from Rio Reservoir is included in the uncontrolled-runoff component. The net effect of these uncertainties is incorporated in the derived hydrograph of uncontrolled runoff. Diversions to Rondout Reservoir from June 1 to November 30, 2001, totaled 125.128 Bgal.

Summary of Operations

From December 1, 2000, to November 30, 2001, diversions from three New York City reservoirs in the Delaware River Basin to Rondout Reservoir totaled 243.306 Bgal, and all releases from the three reservoirs to the Delaware River totaled 125.440 Bgal. River Master directed releases to the Delaware River from these reservoirs totaled 100.984 Bgal.

During the year, maximum storage in Pepacton Reservoir was 141.561 Bgal on April 17; 102.434 Bgal in Cannonsville Reservoir on April 11; and 35.553 Bgal in Neversink Reservoir on April 10. Maximum combined storage in the three reservoirs was 276.596 Bgal on April 16, 2001. The total combined spill for the year was 73.033 Bgal.

During the year, minimum storage in Pepacton Reservoir was 51.915 Bgal (37.0 percent of capacity) on November 30, 2001; 3.245 Bgal (3.4 percent of capacity) in Cannonsville Reservoir on November 26, 2001; and 11.019 Bgal (31.5 percent of capacity) in Neversink Reservoir on November 30, 2001. Minimum combined storage in the three reservoirs was 66.406 Bgal on November 30, 2001.

On November 30, 2001, the end of the report year, combined storage in the three reservoirs was 66.406 Bgal or 24.5 percent of combined capacity. From December 1, 2000, to November 30, 2001, the net change in combined storage was -154.298 Bgal, or a decrease in contents of 57.0 percent of combined capacity.

The distribution of combined storage for the three reservoirs on the first day of the month, for the reference period June 1967 to November 2000, and for the report year, is shown in Figure 4. Storage was above median from December to March and below median from April to November. Storage was above the 75th percentile in January and below the 25th percentile in June, October, and November.

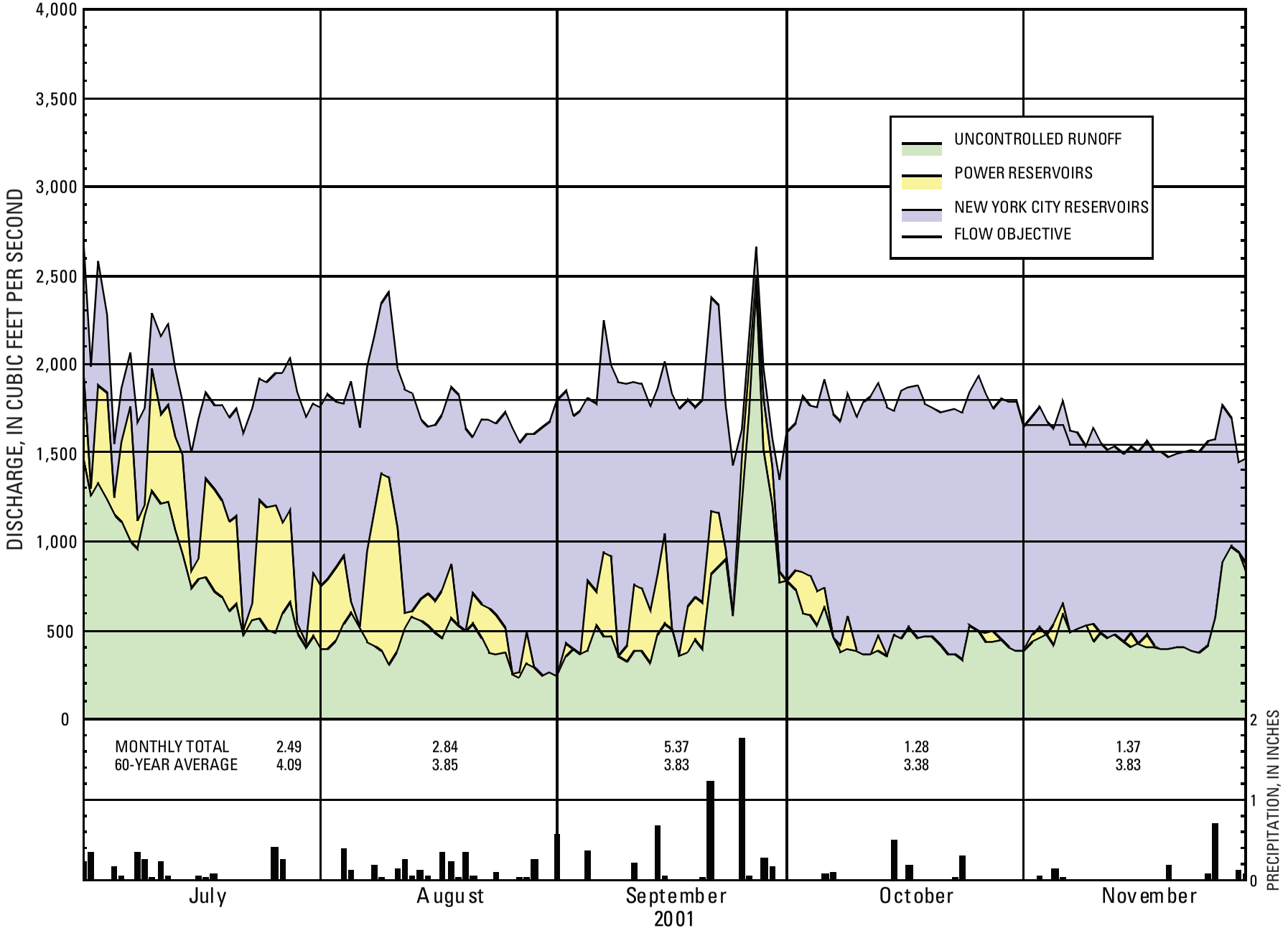

Figure 3. Components of flow, Delaware River at Montague, N.J., July 1 to November 30, 2001.

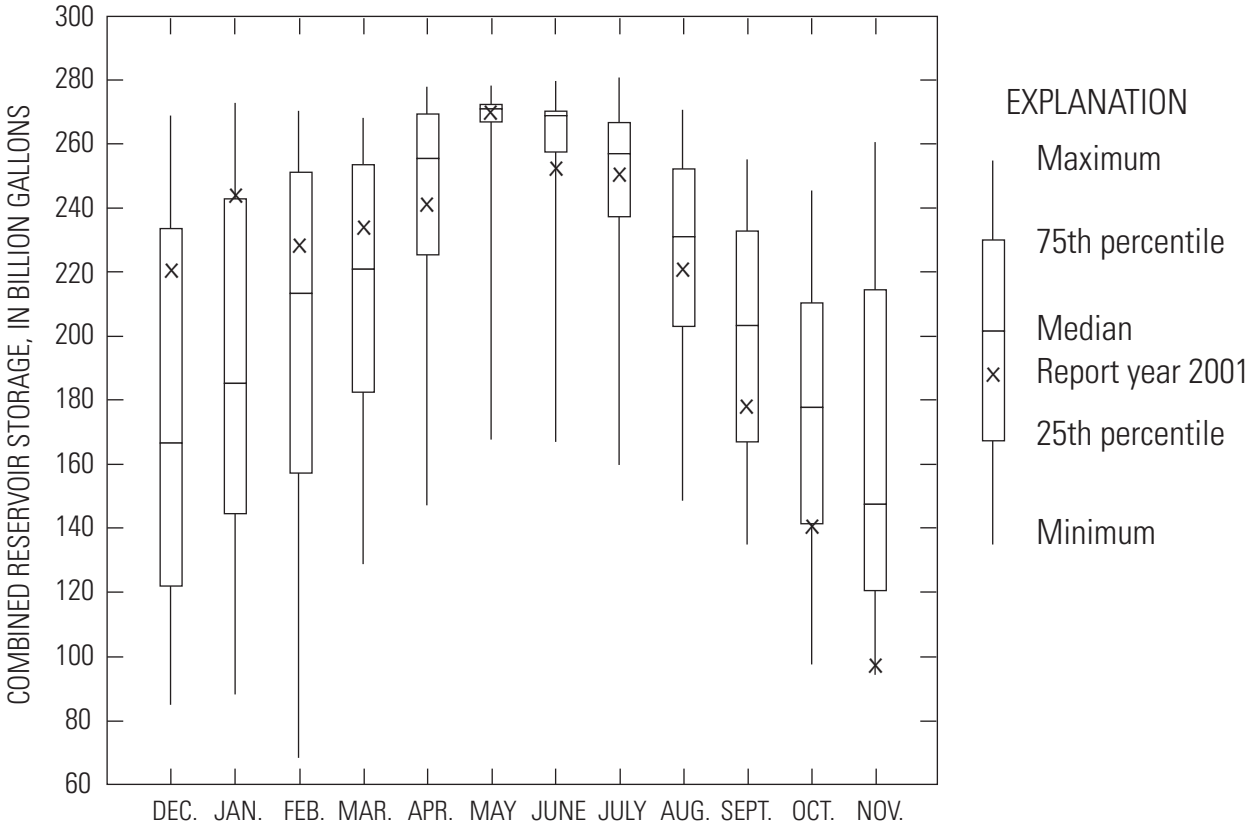

Figure 4. Combined storage in Pepacton, Cannonsville, and Neversink Reservoirs on the first day of the month, December 2000 to November 2001 (this report year), and summary statistics for the period of record, June 1967 to November 2000.

Supplemental Releases from Wallenpaupack Powerplant

An agreement between the PPL Corporation and New York City provides for supplemental releases from the Wallenpaupack hydroelectric powerplant if the Delaware River Basin Commission requests compensation for water consumed at the corporation's Martins Creek steam-electric generating station. Releases may be requested if the flow of the Delaware River at Trenton, N.J., is expected to be less than 3,000 ft^3/s for more than 3 consecutive days. No supplemental releases were requested during the report year.

Streamflow

Components of Flow, Delaware River at Montague, N.J.

The data and computations of the various components of flow form the basic operational records used by the River Master to carry out specific responsibilities related to the Montague formula. The operational record has two parts: forecasted flow at Montague, exclusive of controlled releases from New York City's reservoirs (table 8), and segregation of components of daily mean flow at Montague (table 9).

The following components may be present in the flow of the Delaware River at Montague:

1. Controlled releases from Lake Wallenpaupack on Wallenpaupack Creek, for the production of hydroelectric power.

2. Controlled releases from Rio Reservoir on Mongaup River, for the production of hydroelectric power.
3. Runoff from the uncontrolled area above Montague, including spill from New York City reservoirs.
4. Controlled releases from Pepacton, Cannonsville, and Neversink Reservoirs of New York City.

The releases from New York City's reservoirs necessary to maintain the Montague objective were computed from the forecasted flow at Montague, exclusive of controlled releases from the reservoirs.

Time of Travel

The following are average times for the effective travel of water from the various sources of controlled supply to Montague. These times were used for flow routing during the 2001 report year:

Source	Hours
Pepacton Reservoir	60
Cannonsville Reservoir	48
Neversink Reservoir	33
Lake Wallenpaupack	16
Rio Reservoir	8

The travel times were computed from reservoir and powerplant operations data and historical gaging-station records. The travel times generally are suitable for use in the operations of the River Master. Occasionally, however, significant exceptions are observed. For example, when a large release from Cannonsville Reservoir follows a small release, a substantial portion of the water fills the channel en route, and the remainder may arrive at Montague as much as 18 hours later. During winter, the formation of ice cover, together with low streamflow, gradually increases the resistance to flow, resulting in increased travel times. Because ice-affected travel times increase gradually over several days, and releases were not being directed to meet the Montague objective during periods of ice cover, no adjustments were made to compensate for increased travel times during these periods.

Segregation of Flow at Montague

The River Master daily operations record of reservoir releases and segregation of the various components contributing to the flow of the Delaware River at Montague are presented in table 9. The data are arranged to conform to the downstream movement of water from the various sources to Montague. Summation of data along individual lines in the table is equivalent to routing the various flow contributions to Montague, using the average travel times given previously. Uncontrolled runoff was computed as a residual by subtracting the flow contributions of all other sources from the observed discharge at Montague.

Computation of Directed Releases

During the report year, the River Master used the following information for daily operations: (1) discharges computed from recorded or reported stream gage heights, for various 24-hour periods, without real-time information on any changes in stage-discharge relations; (2) daily discharge from New York City's three reservoirs, measured with venturi meters; (3) rainfall reports for the previous 24 hours; (4) actual powerplant releases converted to daily discharge; (5) advance estimates of power demand converted to daily discharge; (6) advance estimates of uncontrolled runoff at Montague; and (7) average travel times for routing water from various sources. Although uncertainty is inherent in forecasts of future conditions, these data by necessity are used in the daily designs and direction of reservoir releases.

The 60-hour travel time of water from Pepacton Reservoir to Montague is greater than the travel time of water from any other reservoir in the upper Delaware River Basin. Releases from Cannonsville and Neversink Reservoirs were timed to arrive at Montague concurrently with releases from Pepacton Reservoir. To allow for differences in travel times, daily directed releases were scheduled to begin from Pepacton Reservoir at 1200 hours, from Cannonsville Reservoir at 2400 hours, and from Neversink Reservoir at 1500 hours the following day.

Releases from the City's reservoirs required to maintain the specified flow at Montague were computed from forecasts of releases from Lake Wallenpaupack and Rio Reservoir and estimates of uncontrolled runoff at Montague. To account for the travel times from these sources to Montague, the computation requires that estimates of the following components of flow be made 2 or more days in advance: (1) release of water from Lake Wallenpaupack; (2) release of water from Rio Reservoir; and (3) uncontrolled runoff at Montague. The River Master daily operations record for computing daily directed release requirements during periods of low flow is given in table 8.

The electric utilities furnished forecasts of power generation and releases. Because the hydroelectric plants were used chiefly for meeting peak-power demands, the forecasts were subject to various modifying factors including the vagaries of weather on electricity demand. In addition, because the power companies are members of regional power pools, demand for power outside of the local service area unexpectedly may affect generation schedules. As a result, at times, the actual use of water for power generation differed considerably from the forecasts used in the design of reservoir releases.

For computational purposes during periods of low flow, estimates of uncontrolled runoff at Montague were treated as two components: (1) current runoff and (2) forecasted increase in runoff from precipitation. Estimates for these components are given in table 8.

During ice-free conditions, current runoff was computed using a routing and recession procedure based on discharges at 0800 hours at the following USGS gaging stations:

Station Name	Drainage Area (mi^2)
Beaver Kill at Cooks Falls, N.Y.	241
Cadosia Creek at Cadosia, N.Y.	17.9
Oquaga Creek at Deposit, N.Y.	67.6
Equinunk Creek at Equinunk, Pa.	56.3
Callicoon Creek at Callicoon, N.Y.	110
Tenmile River at Tusten, N.Y.	45.6
Lackawaxen River at Hawley, Pa.	290
Shohola Creek near Shohola, Pa.	83.6
Neversink River at Port Jervis, N.Y.	336

During the winter period, the advance estimate of uncontrolled runoff (current conditions) was made on the basis of flows at a reduced network of gaging stations and the recession curve for computed uncontrolled flow at Montague.

The forecasted runoff from precipitation is shown in table 8 under the heading "Weather Adjustment." Throughout the year, the National Weather Service office in Binghamton, N.Y., furnished quantitative forecasts of average precipitation and air temperatures for the drainage area above Montague, N.J. During winter, runoff was estimated on the basis of the current status of snow and ice, along with forecasted precipitation and temperature. During other periods, forecasted precipitation was used to estimate runoff.

The forecasted flow at Montague, exclusive of releases from New York City's reservoirs (table 8), is computed as the sum of forecasted releases from power reservoirs, estimated uncontrolled runoff including conservation releases from Rio Reservoir, and weather adjustments. If the computed flow was less than the

flow objective at Montague, then the deficiency was made up by directed releases from the City's reservoirs.

When forecasts of precipitation or powerplant releases were revised appreciably, the releases required from the reservoirs were recomputed. Commonly, this procedure resulted in a reduced release requirement for New York City reservoirs for that day and, consequently, water was conserved. Only the final data for releases from New York City reservoirs are given in table 8.

Analysis of Forecasts

Forecasts of streamflow at Montague, developed on the basis of anticipated contributions from the components described previously (excluding releases from New York City's reservoirs), differed on most days from observed flow. Occasionally, variations in the components were partially compensating and observed flows were in good agreement with forecasted flows.

The forecasted flow of the Delaware River at Montague, exclusive of releases from New York City reservoirs, was less than the flow objective on most days from July 1 to November 30, 2001. The following tabulation compares estimates of three components of flow at Montague with actual operations during this period.

Releases and Runoff	Forecasted flow [(ft^3/s)-d]	Actual flow [(ft^3/s)-d]
Power releases		
Lake Wallenpaupack	20,915	20,492
Rio Reservoir	7,239	8,107
Runoff from uncontrolled area	99,392	89,142

From July 1 to November 30, actual releases from Lake Wallenpaupack averaged 2 percent less than forecasted releases, and actual releases from Rio Reservoir averaged 12 percent more than forecasted releases. Observed runoff from the uncontrolled area was about 10 percent less than forecasted runoff.

On any given day, the forecasted releases and actual releases can differ considerably. The range of actual daily releases from July 1 to November 30 are as follows: daily releases at Lake Wallenpaupack differed by 198 ft^3/s less to 315 ft^3/s more than forecasted releases, and daily releases at Rio Reservoir differed by 128 ft^3/s less to 624 ft^3/s more than forecasted releases. On the basis of observed flows at Montague, total directed releases from New York City's reservoirs during the report year were 0.6 percent less than that required for exact forecasting.

Comparison of hydrographs of forecasted daily runoff and observed daily runoff from the uncontrolled area (fig. 5) indicates that the forecasts generally were suitable for use in designing releases from New York City's reservoirs. Numerical adjustments to the designs were made when needed to compensate for errors in the forecasts, but because of travel times, the effects of the adjustments on flows at Montague are not evident until several days after the design date.

Analysis of the precipitation forecasts shows that the total precipitation amount forecasted for the 3-day design periods is reasonably accurate, but often the timing of storms may be earlier or later than forecasted. The accuracy of the runoff forecasts is affected greatly by the timing of precipitation events. In addition, if the actual storm track differs from the forecasted track, the amount and timing of runoff can be substantially different than predicted.

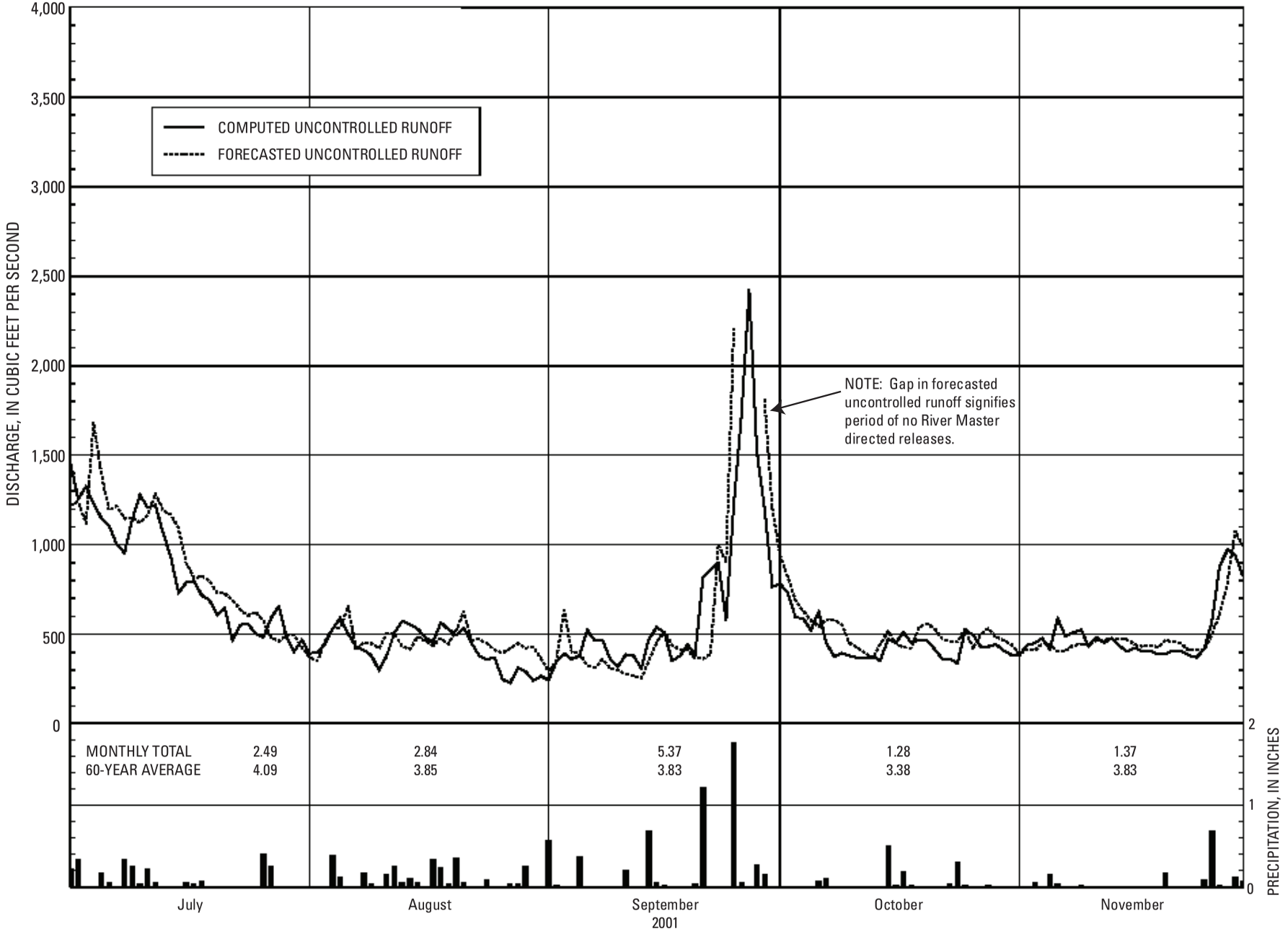

Figure 5. Uncontrolled runoff component, Delaware River at Montague, N.J., July 1 to November 20, 2001.

Diversions to New York City Water Supply

The 1954 Amended Decree authorizes New York City to divert water from the Delaware River Basin at a rate not to exceed 800 Mgal/d. The Decree also specifies that the diversion rate shall be computed as the aggregate total diversion beginning June 1 of each year divided by the number of days elapsed since the preceding May 31.

Diversions during the report year from Pepacton, Cannonsville, and Neversink Reservoirs to the New York City water-supply system (Rondout Reservoir) are given in table 10. Included is a running account of the average rates of combined diversions from the three reservoirs, computed as prescribed by the Decree or the "Interstate Water Management Recommendations of the Parties to the Decree (DRBC Resolution 83-13)." The following tabulation shows allowable maximum diversion rates and average actual diversions for various periods during the report year.

Effective dates	Allowable diversion (Mgal/d)	Average actual diversion (Mgal/d)
June 1, 2000, to May 31, 2001	800	624
June 1, 2001, to October 28, 2001	800	707
October 29, 2001, to November 3, 2001	680	681
November 4-30, 2001	560	558

During the year, a total of 243.306 Bgal of water was diverted to the New York City water-supply system. The allowable diversion was 321.691 Bgal.

Storage in New York City Reservoirs

The following tabulation summarizes the "point of maximum depletion" and other pertinent levels and contents of Pepacton, Cannonsville, and Neversink Reservoirs. This information was provided by the New York City Board of Water Supply.

Level	Pepacton Reservoir		Cannonsville Reservoir		Neversink Reservoir	
	Elevation (ft)	Contents (Bgal)	Elevation (ft)	Contents (Bgal)	Elevation (ft)	Contents (Bgal)
Full pool or spillway crest	1,280.00	*140.190	1,150.00	*95.706	1,440.00	*34.941
Point of maximum depletion	1,152.00	*3.511	1,040.00	*1.020	1,319.00	*0.525
Sill of diversion tunnel	1,143.00	*4.200	+1,035.00	*1.564	1,314.00	
Sill of river outlet tunnel	1,126.50		1,020.50		1,314.00	
Dead storage		1.800		0.328		1.680

*Contents shown are quantities stored between listed elevations.

+Elevation of mouth of inlet channel of diversion works.

Storage in Pepacton, Cannonsville, and Neversink Reservoirs, above the "point of maximum depletion," or minimum full-operating level, is given in tables 3, 4, and 5.

On December 1, 2000, combined storage in the three reservoirs was 220.805 Bgal, or 81.5 percent of combined capacity. As noted previously, storage fluctuated moderately during the winter and then

increased to full capacity in April. Pepacton Reservoir spilled a total of 3.863 Bgal from April 14-26, 2001. Cannonsville Reservoir spilled a total of 58.802 Bgal from December 18, 2000, to January 10, 2001, and from March 21 to May 11, 2001. Neversink Reservoir spilled a total of 10.368 Bgal from April 8-28, 2001. Combined storage reached a maximum for the year on April 16, 2001, when all three reservoirs were spilling. The seasonal decline in storage began in May, earlier than usual. Combined storage declined to 66.406 Bgal, or 24.5 percent of combined capacity, on November 30, 2001.

Comparison of River Master Operations Data With Other Streamflow Records

River Master operations essentially are day-to-day operations, which by necessity use preliminary data on streamflow. In this section, records used in River Master operations are compared to final data published for USGS gaging stations. Data on releases were reported in million gallons per day and converted to cubic feet per second for use in the comparisons.

Releases from New York City Reservoirs

River Master operations data on controlled releases from Pepacton, Cannonsville, and Neversink Reservoirs to the Delaware River were furnished by New York City. These data were obtained from calibrated instruments connected to venturi meters installed in the outlet conduits of the reservoirs.

The USGS gaging station on East Branch Delaware River at Downsville, N.Y., is 0.5 mi downstream from Downsville Dam (fig. 1). Discharge measured at this station includes releases from Pepacton Reservoir and a small amount of seepage and any runoff that enters the channel between the dam and the gaging station. The drainage area is 371 mi^2 at the dam and 372 mi^2 at the gaging station.

The following tabulation compares releases from Pepacton Reservoir (table 9), reported by New York City, to the final records for the USGS gaging station on East Branch Delaware River at Downsville, N.Y. (table 11), for the flow objectives shown.

Flow objective (ft^3/s)	45	70	95	356-360	619-645
N.Y.C.-measured flow (ft^3/s)	45.0	69.6	94.4	358	631
USGS-measured flow (ft^3/s)	46.8	66.0	85.5	350	635
Percent difference*	-3.8	+5.5	+10.4	+2.3	-0.6

$$*\text{Computed as } \frac{\text{(N.Y.C.-measured flow minus USGS-measured flow)}}{\text{(USGS-measured flow)}} \times 100$$

The differences at all flow rates except 95 ft^3/s are less than 6 percent. The River Master's office made one discharge measurement during the year. This measurement yielded a difference similar to that shown in the tabulation at the 70 ft^3/s flow rate. The calibration of instruments connected to the venturi meters was adjusted periodically by New York City to improve the accuracy of the recorded data.

The USGS gaging station on West Branch Delaware River at Stilesville, N.Y., is 1.4 mi downstream from Cannonsville Dam (fig. 1). Discharge measured at this station includes releases from Cannonsville Reservoir and runoff from 2 mi^2 of drainage area between the dam and the gaging station. The drainage area is 454 mi^2 at the dam and 456 mi^2 at the gaging station.

The following tabulation compares releases from Cannonsville Reservoir (table 9), reported by New York City, to the final records for the USGS gaging station on West Branch Delaware River at Stilesville, N.Y. (table 12), for the flow objectives shown.

Flow objective (ft^3/s)	45	160	300-900	900-1400
N.Y.C.-measured flow (ft^3/s)	45.0	160	566	1,190
USGS-measured flow (ft^3/s)	55.3	162	537	1,180
Percent difference*	-18.6	-1.2	+5.4	+0.8

*Computed as $\frac{\text{(N.Y.C.-measured flow minus USGS-measured flow)}}{\text{(USGS-measured flow)}} \times 100$

The gaging-station records are considered fair at flows greater than 100 ft^3/s and poor at flows less than 100 ft^3/s. The records include substantial runoff from precipitation on the area between the dam and the gaging station and seepage near the base of the dam. On January 21, 1998, the seepage was measured at 3.9 ft^3/s, which was greater than rates estimated in prior years. The differences in flow between reservoir-release records and USGS gaging-station records continue to be monitored by the River Master's office, in cooperation with New York City and the USGS Water Science Center in Troy, N.Y. To further investigate the differences, one discharge measurement was made during the report year, just below the Cannonsville release outlet. By measuring flow at this location, most of the runoff contribution from the intervening area between the outlet and the gaging station is eliminated, although seepage near the base of the dam is included. The measurement differed from New York City release records by +4.6 percent (unadjusted) and +6.9 percent (adjusted) for the 160 ft^3/s flow objective.

The USGS gaging station on Neversink River at Neversink, N.Y., is 1,650 ft downstream from Neversink Dam (fig. 1). Discharge measured at this station includes releases from Neversink Reservoir and, during storms, a small amount of runoff that originates between the dam and the gaging station. The drainage area is 92.5 mi^2 at the dam and is 92.6 mi^2 at the gaging station.

The following tabulation compares releases from Neversink Reservoir (table 9), reported by New York City, to the final records for the USGS gaging station on Neversink River at Neversink, N.Y. (table 13), for the flow objectives shown.

Flow objective (ft^3/s)	25	53	74	90-95
N.Y.C.-measured flow (ft^3/s)	24.8	52.5	74.3	92.4
USGS-measured flow (ft^3/s)	25.4	50.1	66.3	89.4
Percent difference*	-2.4	+4.8	+12.1	+3.4

*Computed as $\frac{\text{(N.Y.C.-measured flow minus USGS-measured flow)}}{\text{(USGS-measured flow)}} \times 100$

The River Master's office made one discharge measurement during the year to further investigate the differences between reservoir-release records and USGS gaging-station records. This measurement yielded differences similar to those in the tabulation at the 53 ft^3/s flow rate.

Releases from Lake Wallenpaupack

Records of daily discharge through the Wallenpaupack powerplant were furnished by the PPL Corporation and published by the U.S. Geological Survey as Wallenpaupack Creek at Wilsonville, Pa. (table 14). These discharges represent the flow through the turbines of the powerplant and were computed on a midnight-to-midnight basis. For River Master operations, flows were computed on a 24-hour basis beginning at 0800 hours to compensate for the 16-hour travel time to Montague (table 9).

From December 2000 to November 2001, the River Master's record agrees with the published U.S. Geological Survey record except for some very small differences that result mainly from differences in time frame and rounding of computations. Overall, the records agree to within 0.2 percent for the year.

Delaware River at Montague, N.J.

The River Master's operations record for the Delaware River at Montague, N.J. (table 9) showed 0.2 percent more discharge for the report year than the published U.S. Geological Survey record for the gaging station at that location (table 15). Daily values for the two records were in good agreement.

Diversion Tunnels

Records of diversions through the East Delaware, West Delaware, and Neversink Tunnels (fig. 1) were furnished by the City of New York. These records were obtained from the City's calibrated instruments connected to venturi meters installed in the tunnel conduits. The measured flows were transmitted electronically, on a 15-second interval, to the New York City Department of Environmental Protection computer at the Rondout Effluent Chamber. On 5-minute intervals, release and diversion quantities for the preceding 5-minute period were computed on the basis of the instantaneous rate-of-flow data from each instrument. These 5-minute quantities were summed to compute daily total flows, which were reported to the River Master's office on a daily basis. On a weekly basis, the diversion values were checked against the flow meter totalizer readings and were corrected when necessary. Periodic current-meter measurements were made by the River Master's office to verify the reported diversions. The measurements were made in the outlet channels below the tunnels.

The East Delaware Tunnel is used to divert water from Pepacton Reservoir to Rondout Reservoir. Conditions in the outlet channel of the East Delaware Tunnel were unfavorable for flow measurements during the report year because of high water levels in Rondout Reservoir. Comparison of diversion data provided by New York City with gage height record for the outlet channel of the East Delaware Tunnel did not indicate any large discrepancies in diversions reported by the City.

The generating plant at the downstream end of the East Delaware Tunnel operated most days of the report year. When the powerplant was not in operation, some water leaked through the wicket gates and was not recorded on the totalizer. A current-meter measurement made in 1989 shows that the rate of leakage (assumed constant) is about 8.0 Mgal/d. Because the powerplant was not in operation for the equivalent of 54 days during the 2001 report year, the unmeasured leakage totaled about 0.4 Bgal. The record of diversions through the East Delaware Tunnel is considered essentially correct.

The West Delaware Tunnel is used to divert water from Cannonsville Reservoir to Rondout Reservoir. One current-meter measurement of flow in the West Delaware Tunnel outlet channel was made during the year. This measurement shows that the venturi instrument gave a larger result, specifically, +0.7 percent for the totalizer and +0.9 percent for the rate-of-flow indicator, when compared to the current-meter measurement. Inspections of the channel below the outlet, when valves were closed, revealed only negligible leakage.

A hydroelectric powerplant uses water diverted through the West Delaware Tunnel, but the plant operates only when diversions are less than 300 Mgal/d. When the powerplant is not operating, the valves on the pipelines to the plant are closed, and there is no leakage through the system. The results of the measurements and inspections made during the report year and previous years indicate that the reported record of diversions through the West Delaware Tunnel is essentially correct.

The Neversink Tunnel is used to divert water from Neversink Reservoir to Rondout Reservoir. One current-meter measurement of flow from Neversink Tunnel was made during the report year. This measurement shows that the venturi instrument gave a larger result, specifically, +6.1 percent for the totalizer and +7.1 percent for the rate-of-flow indicator, when compared to the current-meter measurement. The record of diversions through the Neversink Tunnel is considered essentially correct.

A hydroelectric plant uses water diverted through the Neversink Tunnel. When the powerplant is not operating and the main valve on the diversion tunnel is open, leakage develops that is not recorded on the venturi instruments. One measurement made in 1999 showed a leakage rate of 16.2 ft^3/s (10.5 Mgal/d). When the powerplant was operating, the leakage was included in the recorded flow. No leakage occurs when the main valve on the tunnel is closed.

During the 2001 report year, the powerplant operated part of the day on most days and was not operated the equivalent of 254 days. Using the leakage rate noted above and records of power-plant operation, about 2.7 Bgal of water was diverted but not recorded.

Diversions by New Jersey

The Amended Decree authorizes New Jersey to divert water from the Delaware River or its tributaries in New Jersey to areas outside the Delaware River Basin, without compensating releases. These diversions may not exceed 100 Mgal/d as a monthly average, and the daily mean diversion may not exceed 120 Mgal/d. The USGS gaging station on Delaware and Raritan Canal at Port Mercer, N.J. (fig. 1), is used as the official control point for measuring diversions by New Jersey (table 16).

The following tabulation gives the allowable diversion by New Jersey, the period in which the diversion was in effect, and the maximum monthly diversion during the report year:

Effective dates	Allowable monthly average diversion (Mgal/d)	Maximum monthly average diversion (Mgal/d)	Month of maximum average diversion
Dec. 1, 2000, to Nov. 3, 2001	100	101	August 2001
Nov. 4-30, 2001	70	61.0	November 2001

The maximum daily mean diversion was 114 Mgal on August 5, 2001. Diversions by New Jersey were within the allowable limits prescribed by the Decree except during August, when the monthly mean diversion was slightly elevated, but within the accuracy of the recorded discharge.

Conformance of Operations as Provided Under Amended Decree of The U.S. Supreme Court Dated June 7, 1954

From December 1, 2000, to October 28, 2001, operations of the Delaware River Master were conducted as stipulated by the Decree. From October 29, 2001, to November 30, 2001, operations were conducted as prescribed by the "Interstate Water Management Recommendations of the Parties to the Decree (DRBC Resolution 83-13 and DRBC Docket No. D-77-20 CP (Revision No. 4), which were designed to alleviate impending or actual drought conditions in the basin.

Diversions from the Delaware River Basin to the New York City water-supply system were less than those authorized by the Decree and the "Interstate Water Management Recommendations of the Parties to the Decree." Under compensating releases of the Montague Formula, New York City released water from its reservoirs at rates designed by the River Master to maintain the applicable flow objectives at Montague. During the report year, New York City complied fully with the directives of the River Master.

Diversions from the Delaware River Basin by New Jersey were in compliance with applicable limits. New Jersey complied fully with the requests of the River Master.

Table 1. Precipitation in the Delaware River Basin above Montague, N.J.

[All values, except percentages, in inches]

Month	December 1940 to November 2000 Monthly Average	December 2000 to November 2001			
		Amount	Percent of average	Surplus (+) or deficit (-)	
				Month	Cumulative
December	3.34	4.30	129	+.96	+.96
January	3.02	1.46	48	-1.56	-.60
February	2.65	2.38	90	-.27	-.87
March	3.33	4.95	149	+1.62	+.75
April	3.77	1.35	36	-2.42	-1.67
May	4.21	3.08	73	-1.13	-2.80
June	3.96	4.06	103	+.10	-2.70
July	4.09	2.49	61	-1.60	-4.30
August	3.85	2.84	74	-1.01	-5.31
September	3.83	5.37	140	+1.54	-3.77
October	3.38	1.28	38	-2.10	-5.87
November	3.83	1.37	36	-2.46	-8.33
12 months	43.26	34.93	81	-8.33	

Table 2. Conservation release rates for New York City reservoirs in the Delaware River Basin

[All values in cubic feet per second]

Reservoir	Effective dates	Conservation release rates		
		Basic	Augumented	Experimental
Pepacton	December 1 to March 31	6	50	45
	April 1-7	6	70	45
	April 8-30	19	70	45
	May 1-31	19	70	70
	June 1 to August 31	19	70	95
	September 1-30	19	70	70
	October 1-31	19	70	45
	November 1-30	6	50	45
Cannonsville	December 1 to March 31	8	33	45
	April 1-15	8	45	45
	April 16 to May 31	23	45	45
	June 1-14	23	45	160
	June 15 to August 15	23	325	160
	August 16 to September 15	23	45	160
	September 16 to October 31	23	45	45
	November 1-30	23	33	45
Neversink	December 1 to March 31	5	25	25
	April 1-7	5	45	25
	April 8-30	15	45	25
	May 1 to September 30	15	45	53
	October 1-31	15	45	25
	November 1-30	5	25	25

Table 3. Storage in Pepacton Reservoir, N.Y., for year ending November 30, 2001

[Storage in millions of gallons above elevation 1,152.00 ft. Add 7,711 million gallons for total contents above sill of outlet tunnel, elevation 1,126.50 ft. Storage at spillway level is 140,190 million gallons]
(River Master daily operations record; gage reading at 0800 hours)

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	109,916	117,249	108,508	107,573	109,948	139,050	128,673	129,908	116,930	102,492	89,199	74,675
2	109,738	116,981	108,427	107,220	110,811	138,664	128,357	129,678	116,562	101,789	88,893	73,901
3	109,202	116,796	108,088	107,108	111,415	138,351	128,849	129,306	116,026	101,538	88,533	73,445
4	109,056	116,578	107,959	106,932	111,939	138,149	129,060	129,025	115,542	101,164	87,969	72,626
5	108,765	116,545	107,653	106,948	112,398	137,857	129,849	128,708	115,194	100,652	87,524	72,033
6	108,282	116,261	107,637	106,948	113,453	137,657	129,112	128,233	114,678	100,249	87,095	71,211
7	108,217	115,993	107,541	106,564	114,545	137,181	129,130	127,723	114,296	99,939	86,480	70,485
8	107,847	115,608	107,268	106,484	116,144	136,763	129,359	127,320	113,700	99,336	86,208	69,801
9	107,589	115,459	107,060	106,388	118,512	136,636	129,394	127,128	113,173	98,813	85,512	68,920
10	107,204	115,227	106,868	106,212	122,773	136,272	129,430	126,726	112,563	98,245	85,101	67,933
11	106,932	114,895	107,460	106,116	127,023	135,982	129,642	126,132	112,168	97,801	84,594	67,188
12	106,692	114,578	107,573	105,748	130,404	135,801	129,571	125,783	111,889	97,328	84,145	66,252
13	106,564	114,097	107,605	105,717	134,264	135,203	129,377	125,314	111,480	96,810	83,597	65,507
14	106,148	113,964	107,798	105,653	137,730	134,805	128,989	124,846	110,925	96,385	83,401	64,583
15	105,796	113,700	108,217	105,558	140,505	134,390	128,937	124,447	110,469	96,159	82,997	63,629
16	105,478	113,305	108,298	105,415	141,412	133,887	128,655	124,031	109,786	95,690	82,663	62,827
17	105,701	113,024	108,443	105,383	141,561	133,455	129,042	123,756	109,380	95,040	82,037	62,066
18	112,613	112,745	108,524	105,462	141,431	133,078	129,465	123,187	108,943	94,531	81,636	61,156
19	115,194	112,431	108,411	105,510	140,987	132,541	129,678	122,756	108,476	94,051	81,374	60,346
20	116,311	112,070	108,363	105,462	140,634	132,093	129,837	122,429	108,040	93,662	80,906	59,565
21	116,964	111,644	108,347	105,605	140,375	131,719	129,943	121,660	107,573	93,258	80,465	58,709
22	117,266	111,447	108,298	105,860	140,338	131,274	129,961	121,248	107,124	92,813	80,028	57,926
23	117,635	111,089	108,185	106,244	140,449	130,954	130,191	120,855	106,724	92,264	79,469	56,978
24	117,602	110,533	107,863	106,580	140,505	130,670	130,457	120,582	106,340	91,806	79,128	56,082
25	117,702	110,322	107,814	106,932	140,264	130,369	130,741	119,818	105,844	91,482	78,789	55,337
26	117,551	110,160	107,573	107,092	140,246	130,014	130,830	119,699	105,241	91,423	78,235	54,686
27	117,585	109,819	107,831	107,236	140,024	129,837	130,972	119,240	104,779	91,100	77,789	53,859
28	117,451	109,267	107,718	107,412	139,730	129,571	131,167	118,951	104,272	90,569	77,212	53,325
29	117,585	109,024		107,702	139,418	129,483	130,777	118,411	103,846	90,059	76,662	52,729
30	117,451	108,540		108,266	139,160	129,359	130,422	117,922	103,137	89,855	75,984	51,915
31	117,400	108,653		109,105		128,919		117,484	102,775		75,241	
Change	+7,208	-8,747	-935	+1,387	+30,055	-10,241	+1,503	-12,938	-14,709	-12,920	-14,614	-23,326
Equiv. Mgal/d	+232.5	-282.2	-33.4	+44.7	+1,001.8	-330.4	+50.1	-417.4	-474.5	-430.7	-471.4	-777.5
Equiv. ft^3/s	+360	-437	-51.7	+69.2	+1,550	-511	+77.5	-646	-734	-666	-729	-1,203

Change for year -58,277 Mgal | Equivalent for year -159.7 Mgal/d | Equivalent for year -247 ft^3/s

Table 4. Storage in Cannonsville Reservoir, N.Y., for year ending November 30, 2001

[Storage in millions of gallons above elevation 1,040.00 ft. Add 2,584 million gallons for total contents above sill outlet tunnel, elevation 1,020.50 ft. Storage at spillway level is 95,706 million gallons]
(River Master daily operations record; gage reading at 0800 hours)

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	87,204	97,396	89,073	94,976	98,297	96,993	91,827	89,165	76,661	53,214	33,368	9,787
2	87,334	97,363	88,784	95,098	98,217	96,864	92,101	88,967	76,053	52,409	32,648	9,299
3	87,479	97,041	88,435	95,082	97,846	96,623	92,207	88,967	75,348	51,592	32,027	8,816
4	87,666	96,527	88,237	95,143	97,557	96,430	92,207	88,906	74,602	50,986	31,267	8,374
5	87,782	96,350	88,013	95,204	97,347	96,237	92,527	88,906	73,887	50,297	30,386	7,950
6	87,956	96,205	87,883	95,341	97,524	96,269	92,847	88,921	73,185	49,445	29,385	7,567
7	88,146	96,092	87,797	95,295	97,959	96,205	93,059	88,663	72,510	48,726	28,671	7,288
8	88,252	95,996	87,493	95,371	98,844	96,237	92,877	88,602	71,914	47,703	27,945	7,075
9	88,283	95,851	87,479	95,311	99,939	96,205	92,923	88,541	71,331	46,858	27,162	6,765
10	88,526	95,706	87,753	95,326	101,420	96,124	92,710	88,480	70,563	46,112	26,345	6,521
11	88,739	95,554	89,058	95,158	102,434	96,092	92,573	88,374	69,781	45,456	25,545	6,330
12	88,921	95,417	89,530	95,128	101,919	95,706	92,497	88,343	69,000	44,800	24,694	6,129
13	89,180	95,174	89,925	95,128	101,693	95,402	92,344	88,013	68,364	44,122	23,823	5,952
14	89,332	94,885	90,488	95,174	101,307	95,234	91,994	87,522	67,675	43,622	23,072	5,816
15	89,484	94,626	91,066	95,326	100,631	94,809	91,690	87,074	66,948	42,815	22,322	5,571
16	89,712	94,322	92,314	95,493	99,890	94,444	90,838	86,756	66,248	41,953	21,649	5,379
17	90,229	94,002	92,770	95,600	99,376	93,926	90,747	86,352	65,650	41,312	20,891	5,100
18	95,189	93,683	92,983	95,584	98,893	93,409	90,731	86,063	64,899	40,430	20,168	4,881
19	97,830	93,607	93,303	95,676	98,297	92,892	90,473	85,571	64,198	39,484	19,465	4,666
20	98,539	93,394	93,485	95,569	98,474	92,329	90,047	85,094	63,536	38,402	18,761	4,425
21	98,587	93,075	93,805	95,615	98,217	91,675	89,804	84,212	62,734	37,549	17,966	4,180
22	98,362	92,649	93,896	95,947	98,104	91,523	89,773	83,432	62,033	37,004	17,172	3,946
23	98,056	92,329	94,018	96,414	97,766	91,568	89,819	82,825	61,320	36,360	16,255	3,699
24	97,750	91,842	94,170	96,575	97,718	91,523	90,032	82,232	60,488	36,092	15,451	3,446
25	97,557	91,568	94,307	96,720	97,589	91,523	90,108	81,625	59,560	36,003	14,518	3,284
26	97,331	90,777	94,444	96,671	97,508	91,431	90,047	80,975	58,668	35,786	13,708	3,245
27	97,267	90,488	94,793	96,736	97,347	91,431	89,986	80,253	57,801	35,518	13,011	3,294
28	97,138	90,093	94,946	96,848	97,186	91,553	89,834	79,465	56,983	35,172	12,257	3,355
29	97,058	89,697		96,913	97,202	91,705	89,575	78,678	55,994	34,686	11,475	3,414
30	97,396	89,317		97,041	97,090	91,690	89,302	78,056	55,018	34,052	10,726	3,472
31	97,476	89,134		98,104		91,781		77,324	54,031		10,269	
Change	+10,561	-8,342	+5,812	+3,158	-1,014	-5,309	-2,479	-11,978	-23,293	-19,979	-23,783	-6,797
Equiv. Mgal/d	+340.7	-269.1	+207.6	+101.9	-33.8	-171.3	-82.6	-386.4	-751.4	-666.0	-767.2	-226.6
Equiv. ft^3/s	+527	-416	+321	+158	-52.3	-265	-128	-598	-1,162	-1,030	-1,187	-350
Change for year -83,443 Mgal					Equivalent for year -228.6 Mgal/d						Equivalent for year -354 ft^3/s	

Table 5. Storage in Neversink Reservoir, N.Y., for year ending November 30, 2001

[Storage in millions of gallons above elevation 1,319.00 ft. Add 525 million gallons for total contents above sill of outlet tunnel, elevation 1,314.00 ft. Storage at spillway level is 34,941 million gallons]
(River Master daily operations record; gage reading at 0800 hours)

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	23,685	29,733	31,026	31,775	33,804	34,665	32,232	32,023	27,792	22,783	18,544	13,147
2	23,753	29,814	30,952	31,855	33,974	34,650	32,377	32,014	27,507	22,615	18,562	12,960
3	23,797	29,860	30,891	31,892	34,013	34,572	32,795	31,761	27,215	22,466	18,572	12,775
4	23,817	29,928	30,845	31,958	34,057	34,463	33,101	31,672	26,914	22,431	18,398	12,568
5	23,882	30,013	30,758	32,061	34,121	34,384	33,235	31,583	26,672	22,271	18,261	12,560
6	23,951	30,132	30,749	32,103	34,224	34,306	33,408	31,443	26,452	22,105	18,070	12,551
7	23,991	30,177	30,698	32,160	34,453	34,189	33,485	31,243	26,232	21,919	17,830	12,537
8	23,999	30,259	30,661	32,085	34,774	34,155	33,553	31,090	26,051	21,692	17,574	12,522
9	24,055	30,301	30,621	31,860	35,070	34,023	33,611	30,975	25,813	21,484	17,342	12,520
10	24,140	30,346	30,693	31,873	35,553	33,867	33,654	30,822	25,542	21,253	17,096	12,511
11	24,165	30,328	30,762	31,868	35,458	33,713	33,708	30,644	25,366	21,070	16,864	12,482
12	24,259	30,456	30,758	31,878	35,344	33,568	33,770	30,451	25,201	20,840	16,641	12,511
13	24,331	30,529	30,822	31,878	35,399	33,529	33,620	30,273	25,138	20,600	16,407	12,508
14	24,323	30,542	30,887	31,976	35,443	33,485	33,441	30,164	24,998	20,428	16,404	12,479
15	24,311	30,612	30,970	31,995	35,319	33,283	33,278	29,964	24,924	20,399	16,420	12,488
16	24,385	30,661	31,030	31,939	35,294	33,086	33,057	29,865	24,838	20,187	16,424	12,488
17	24,409	30,661	31,104	31,962	35,234	32,914	33,616	29,760	24,699	19,942	16,447	12,453
18	27,770	30,721	31,150	32,042	35,175	32,719	34,243	29,607	24,556	19,719	16,420	12,320
19	28,228	30,730	31,132	32,090	35,135	32,596	34,135	29,446	24,430	19,482	16,146	12,187
20	28,425	30,795	31,229	32,146	35,100	32,386	33,920	29,477	24,360	19,231	15,867	12,057
21	28,535	30,854	31,313	32,208	35,080	32,274	33,649	29,473	24,218	19,122	15,857	11,913
22	28,694	30,877	31,304	32,339	35,165	32,232	33,283	29,297	24,063	19,007	15,854	11,806
23	28,835	30,873	31,354	32,562	35,150	32,094	32,995	29,133	23,914	18,832	15,551	11,656
24	28,994	30,910	31,420	32,643	35,150	32,047	32,919	29,030	23,797	18,643	15,241	11,515
25	29,026	30,961	31,494	32,771	35,130	31,939	32,838	28,870	23,637	18,611	14,923	11,394
26	29,066	30,980	31,620	32,834	35,090	31,761	32,747	28,778	23,561	18,811	14,589	11,336
27	29,222	30,980	31,644	32,972	35,026	31,873	32,643	28,592	23,437	18,672	14,262	11,276
28	29,360	30,947	31,724	33,038	35,016	32,037	32,510	28,403	23,302	18,547	13,936	11,172
29	29,423	31,012		33,134	34,887	32,108	32,307	28,224	23,302	18,533	13,607	11,104
30	29,558	30,952		33,245	34,774	32,165	32,137	28,014	23,171	18,551	13,559	11,019
31	29,656	31,007		33,625		32,198		27,892	22,976		13,358	
Change	+6,059	+1,351	+717	+1,901	+1,149	-2,576	-61	-4,245	-4,916	-4,425	-5,193	-2,339
Equiv. Mgal/d	+195.5	+43.6	+25.6	+61.3	+38.3	-83.1	-2.0	-136.9	-158.6	-147.5	-167.5	-78.0
Equiv. ft^3/s	+302	+67.4	+39.6	+94.9	+59.3	-129	-3.1	-212	-245	-228	-259	-121

Change for year -12,578 Mgal | Equivalent for year -34.5 Mgal/d | Equivalent for year -53.3 ft^3/s

Table 6. Design rates for Delaware River at Montague, N.J. gaging station, December 1, 2000 to November 30, 2001

[Rates in cubic feet per second]

Effective dates	Montague Design Rate
December 1, 2000 to March 14, 2001	1,810
March 15 to June 14, 2001	1,750
June 15 to October 31, 2001	1,800
November 1-6, 2001	1,655
November 7-30, 2001	1,550

Table 7. Consumption of water by New York City, 1950 to 2001
Data furnished by New York City, Department of Environmental Protection, Bureau of Water Supply

[Mgal/d, million gallons per day; Bgal, billion gallons]

Year	Average daily consumption			Annual Consumption (Bgal)
	City Proper (Mgal/d)	Outside Communities (Mgal/d)	Total (Mgal/d)	
1950	953.3	29.1	982.4	358.576
51	1,041.9	28.1	1,070.0	390.550
52	1,087.0	32.7	1,119.7	409.810
53	1,093.9	44.6	1,138.5	415.552
54	1,063.4	46.3	1,109.7	405.040
1955	1,109.9	45.3	1,155.2	421.648
56	1,111.3	48.9	1,160.2	424.633
57	1,169.0	57.2	1,226.2	447.563
58	1,152.9	49.6	1,202.5	438.912
59	1,204.3	60.3	1,264.6	461.579
1960	1,199.4	58.9	1,258.3	460.529
61	1,221.0	64.0	1,285.0	469.022
62	1,207.6	68.8	1,276.4	465.896
63	1,218.0	76.7	1,294.7	472.582
64	1,189.2	79.4	1,268.6	464.295
1965	1,052.1	71.2	1,123.3	409.995
66	1,044.9	73.2	1,118.1	408.128
67	1,135.3	71.0	1,206.3	440.302
68	1,242.0	78.2	1,320.2	483.175
69	1,328.7	80.1	1,408.8	514.229
1970	1,400.3	90.4	1,490.7	544.116
71	1,423.6	87.9	1,511.5	551.695
72	1,412.4	83.0	1,495.4	547.340
73	1,448.9	95.4	1,544.3	563.681
74	1,441.8	96.3	1,538.1	561.409
1975	1,415.0	92.1	1,507.1	550.093
76	1,435.0	95.8	1,530.8	560.264
77	1,483.0	104.7	1,587.7	579.510
78	1,479.4	103.0	1,582.4	577.566
79	1,513.0	104.6	1,617.6	590.426
1980	1,506.3	110.1	1,616.3	591.582
81	1,309.5	100.0	1,409.5	514.475
82	1,383.0	104.8	1,487.8	543.060
83	1,424.2	112.6	1,536.8	561.010
84	1,465.2	113.9	1,579.1	577.963
1985	1,325.4	106.5	1,431.9	522.656
86	1,351.1	115.2	1,466.3	535.200
87	1,447.1	119.8	1,566.9	571.885
88	1,484.3	125.6	1,609.9	589.090
89	1,402.0	113.4	1,515.4	553.158
1990	1,424.4	122.4	1,546.8	564.577
91	1,469.9	123.6	1,593.5	581.628
92	1,368.7	113.9	1,482.6	542.632
93	1,368.9	118.8	1,487.7	543.011
94	1,357.8	119.2	1,477.0	539.105
1995	1,326.1	123.1	1,449.2	528.958
96	1,283.5	120.2	1,403.7	512.351
97	1,201.3	123.5	1,324.8	483.552
98	1,220.0	124.7	1,344.7	490.816
99	1,237.2	128.6	1,365.8	498.517
2000	1,240.4	124.9	1,365.3	499.700
01	1,184.0	128.4	1,312.4	479.026

Table 8. New York City reservoir release design data (River Master daily operation record)

[ft³/s, cubic feet per second; (ft³/s)-d, cubic feet per second days; Col., Column]

Advance estimate of discharge of Delaware River at Montague, N.J. exclusive of New York City reservoir releases										Computation of balancing adjustment					
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Montague date	Discharge (ft³/s)	Indicated deficiency (ft³/s)	Balancing adjustment (ft³/s)	Directed release (ft³/s)	Adusted directed release		Actual deficiency		Cumulative difference (ft³/s)-d	Balancing adjustment (ft³/s)
	Lake Wallenpaupack (ft³/s)	Rio Reservoir (ft³/s)	Current condition (ft³/s)	Weather adjustment (ft³/s)						Daily (ft³/s)	Cumulative (ft³/s)-d	Daily (ft³/s)	Cumulative (ft³/s)-d		
2001	Col. 1	Col. 2	Col. 3	Col. 4		Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
MONTAGUE DESIGN RATE = 1,810 (ft³/s) -- DECEMBER 1, 2000 to MARCH 14, 2001 The estimate discharge at Montague was greater than the Montague design rate from Dec. 1, 2000 to March 14, 2001															
MONTAGUE DESIGN RATE = 1,750 (ft³/s) -- MARCH 15, 2001 to JUNE 14, 2001 The estimate discharge at Montague was greater than the Montague design rate from March 15, 2001 to May 12, 2001															
May 10	0	64	1,400	22	May 13	1,486	264	-	264	268	268	178	178	+90	-9
11	0	112	1,361	304	14	1,777	0	-	0	0	268	239	417	-149	+15
12	0	112	1,336	52	15	1,500	250	-	250	253	521	483	900	-379	+38
13	0	112	1,312	2	16	1,426	324	-	324	324	845	574	1,474	-629	+50
14	0	0	1,251	0	17	1,251	499	-9	490	493	1,338	613	2,087	-749	+50
15	0	32	1,209	29	18	1,270	480	+15	495	500	1,838	540	2,627	-789	+50
16	0	0	1,085	72	19	1,157	593	+38	631	632	2,470	512	3,139	-669	+50
17	0	0	998	81	20	1,079	671	+50	721	723	3,193	533	3,672	-479	+48
18	0	32	998	41	21	1,071	679	+50	729	729	3,922	589	4,261	-339	+34
19	0	32	958	44	22	1,034	716	+50	766	767	4,689	427	4,688	+1	0
20	0	32	959	645	23	1,536	214	+50	264	265	4,954	0	4,688	+266	-27
The estimated discharge at Montague was greater than the Montague design rate from May 24, 2001 to June 14, 2001.															
Montague Design Rate = 1,800 ft³/s -- June 15, 2001 to October 31, 2001. The estimated discharge at Montague was greater than the Montague design rate from June 15, 2001 to June 30, 2001.															

Col. 1 - Furnished by power company.
Col. 2 - Furnished by power company.
Col. 3 - Computed from index stations.
Col. 4 - Computed increase in runoff based on quantitative precipitation forecasts.
Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = Design rate - Col. 5, when positive; otherwise Col. 6 = 0.
Col. 7 = Col. 14 (4 days earlier).
Col. 8 = Design rate - Col. 5 + Col. 7, when positive; otherwise Col. 8 = 0.
Col. 9 = Col. 7 from Table 10.
Col. 10 = Summation of Col. 9.
Col. 11 = Design rate - (Col. 9 + Col. 10 from Table 9), when positive; otherwise Col. 11 = 0.
Col. 12 = Summation of Col. 11.
Col. 13 = Col. 10 - Col. 12.
Col. 14 = Col. 13 divided by -10, limited to ±50.

Table 8. New York City reservoir release design data—continued (River Master daily operation record)

[ft^3/s, cubic feet per second; (ft^3/s)-d, cubic feet per second days; Col., Column]

Advance estimate of discharge of Delaware River at Montague, N.J. exclusive of New York City reservoir releases										Computation of balancing adjustment					
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Montague date	Discharge (ft^3/s)	Indicated deficiency (ft^3/s)	Balancing adjustment (ft^3/s)	Directed release (ft^3/s)	Adusted directed release		Actual deficiency		Cumulative difference (ft^3/s)-d	Balancing adjustment (ft^3/s)
	Lake Wallenpaupack (ft^3/s)	Rio Reservoir (ft^3/s)	Current condition (ft^3/s)	Weather adjustment (ft^3/s)						Daily (ft^3/s)	Cumulative (ft^3/s)-d	Daily (ft^3/s)	Cumulative (ft^3/s)-d		
2001	Col. 1	Col. 2	Col. 3	Col. 4		Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
June 28	352	96	1,204	16	July 1	1,668	132	0	132	132	132	0	0	+132	-13
29	0	144	1,111	130	2	1,385	415	0	415	415	547	505	505	+42	-4
30	512	112	1,041	77	3	1,742	58	0	58	58	605	0	505	+100	-10
July 1	512	80	1,352	329	4	2,273	0	0	0	0	605	0	505	+100	-10
2	0	96	1,335	59	5	1,490	310	-13	297	297	902	556	1,061	-159	+16
3	512	96	1,149	43	6	1,800	0	-4	0	0	902	246	1,307	-405	+40
4	512	78	1,042	175	7	1,807	0	-10	0	0	902	46	1,353	-451	+45
5	0	80	1,140	5	8	1,225	575	-10	565	563	1,465	693	2,046	-581	+50
6	0	112	1,128	25	9	1,265	535	+16	551	551	2,016	601	2,647	-631	+50
7	448	96	1,065	57	10	1,666	134	+40	174	174	2,190	0	2,647	-457	+46
8	448	96	1,070	96	11	1,710	90	+45	135	135	2,325	79	2,726	-401	+40
9	448	64	1,204	83	12	1,799	1	+50	51	51	2,376	33	2,759	-383	+38
10	448	112	1,103	87	13	1,750	50	+50	100	100	2,476	211	2,970	-494	+49
11	448	96	1,137	33	14	1,714	86	+46	132	132	2,608	316	3,286	-678	+50
12	0	80	1,088	4	15	1,172	628	+40	668	667	3,275	977	4,263	-988	+50
13	58	96	896	1	16	1,051	749	+38	787	787	4,062	897	5,160	-1,098	+50
14	449	96	810	4	17	1,359	441	+49	490	489	4,551	449	5,609	-1,058	+50
15	449	96	754	70	18	1,369	431	+50	481	480	5,031	510	6,119	-1,088	+50
16	449	64	737	62	19	1,312	488	+50	538	538	5,569	568	6,687	-1,118	+50
17	449	80	702	32	20	1,263	537	+50	587	588	6,157	691	7,378	-1,221	+50
18	449	64	718	11	21	1,242	558	+50	608	607	6,764	657	8,035	-1,271	+50
19	0	64	689	2	22	755	1,045	+50	1,095	1,111	7,875	1,301	9,336	-1,461	+50
20	0	112	636	0	23	748	1,052	+50	1,102	1,101	8,976	1,151	10,487	-1,511	+50
21	449	112	604	0	24	1,165	635	+50	685	685	9,661	565	11,052	-1,391	+50
22	449	112	564	60	25	1,185	615	+50	665	665	10,326	608	11,660	-1,334	+50
23	449	80	523	53	26	1,105	695	+50	745	745	11,075	599	12,259	-1,184	+50
24	449	64	395	89	27	997	803	+50	853	853	11,922	697	12,956	-1,034	+50
25	449	48	375	86	28	958	842	+50	892	892	12,776	624	13,580	-804	+50
26	0	48	440	54	29	542	1,258	+50	1,308	1,308	14,079	1,263	14,843	-764	+50
27	0	80	490	4	30	574	1,226	+50	1,276	1,276	15,355	1,376	16,219	-864	+50
28	385	80	427	0	31	892	908	+50	958	958	16,313	978	17,197	-884	+50

Col. 1 - Furnished by power company.
Col. 2 - Furnished by power company.
Col. 3 - Computed from index stations.
Col. 4 - Computed increase in runoff based on quantitative precipitation forecasts.
Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = Design rate - Col. 5, when positive; otherwise Col. 6 = 0.
Col. 7 = Col. 14 (4 days earlier).
Col. 8 = Design rate - Col. 5 + Col. 7, when positive; otherwise Col. 8 = 0.
Col. 9 = Col. 7 from Table 10.
Col. 10 = Summation of Col. 9.
Col. 11 = Design rate - (Col. 9 + Col. 10 from Table 9), when positive; otherwise Col. 11 = 0.
Col. 12 = Summation of Col. 11.
Col. 13 = Col. 10 - Col. 12.
Col. 14 = Col. 13 divided by -10, limited to ±50.

Table 8. New York City reservoir release design data—continued
(River Master daily operation record)

[ft³/s, cubic feet per second; (ft³/s)-d, cubic feet per second days; Col., Column]

Advance estimate of discharge of Delaware River at Montague, N.J. exclusive of New York City reservoir releases										Computation of balancing adjustment					
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Montague date	Discharge (ft³/s)	Indicated deficiency (ft³/s)	Balancing adjustment (ft³/s)	Directed release (ft³/s)	Adusted directed release		Actual deficiency		Cumulative difference (ft³/s)-d	Balancing adjustment (ft³/s)
	Lake Wallenpaupack (ft³/s)	Rio Reservoir (ft³/s)	Current condition (ft³/s)	Weather adjustment (ft³/s)						Daily (ft³/s)	Cumulative (ft³/s)-d	Daily (ft³/s)	Cumulative (ft³/s)-d		
2001	Col. 1	Col. 2	Col. 3	Col. 4		Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
July 29	385	80	372	0	Aug. 1	837	963	+50	1,013	1,010	17,323	1,050	18,247	-924	+50
30	385	71	351	0	2	807	993	+50	1,043	1,042	18,365	1,012	19,259	-894	+50
31	385	71	428	31	3	915	885	+50	935	932	19,297	942	20,201	-904	+50
Aug. 1	385	71	400	132	4	988	812	+50	862	863	20,160	883	21,084	-924	+50
2	0	71	376	160	5	607	1,193	+50	1,243	1,242	21,402	1,142	22,226	-824	+50
3	0	71	382	277	6	730	1,070	+50	1,120	1,120	22,522	1,280	23,506	-984	+50
4	321	71	398	16	7	806	994	+50	1,044	1,045	23,567	865	24,371	-804	+50
5	321	71	454	0	8	846	954	+50	1,004	999	24,566	649	25,020	-454	+45
6	321	128	438	10	9	897	903	+50	953	952	25,518	412	25,432	+86	-9
7	321	71	413	8	10	813	987	+50	1,037	1,039	26,557	439	25,871	+686	-50
8	321	128	424	81	11	954	846	+50	896	897	27,454	727	26,598	+856	-50
9	0	71	395	110	12	576	1,224	+45	1,269	1,266	28,720	1,206	27,804	+916	-50
10	0	128	376	55	13	559	1,241	-9	1,232	1,231	29,951	1,191	28,995	+956	-50
11	193	128	389	28	14	738	1,062	-50	1,012	1,013	30,964	1,123	30,118	+846	-50
12	193	128	415	71	15	807	993	-50	943	942	31,906	1,092	31,210	+696	-50
13	193	96	456	6	16	751	1,049	-50	999	998	32,904	1,138	32,348	+556	-50
14	193	128	437	0	17	758	1,042	-50	992	990	33,894	1,070	33,418	+476	-48
15	193	80	448	30	18	751	1,049	-50	999	997	34,891	927	34,345	+546	-50
16	0	0	427	19	19	446	1,354	-50	1,304	1,302	36,193	1,272	35,617	+576	-50
17	0	78	478	43	20	599	1,201	-50	1,151	1,144	37,337	1,306	36,923	+414	-41
18	160	78	469	160	21	867	933	-48	885	884	38,221	1,096	38,019	+202	-20
19	160	78	438	28	22	704	1,096	-50	1,046	1,044	39,265	1,154	39,173	+92	-9
20	160	53	431	42	23	686	1,114	-50	1,064	1,062	40,327	1,172	40,345	-18	+2
21	160	64	419	29	24	672	1,128	-41	1,087	1,085	41,412	1,215	41,560	-148	+15
22	160	0	396	17	25	573	1,227	-20	1,207	1,211	42,623	1,281	42,841	-218	+22
23	0	0	383	12	26	395	1,405	-9	1,396	1,392	44,015	1,552	44,393	-378	+38
24	0	80	399	24	27	503	1,297	+2	1,299	1,300	45,315	1,540	45,933	-618	+50
25	161	80	422	27	28	690	1,110	+15	1,125	1,123	46,438	1,313	47,246	-808	+50
26	0	80	400	24	29	504	1,296	+22	1,318	1,318	47,756	1,508	48,754	-998	+50
27	0	0	401	28	30	429	1,371	+38	1,409	1,409	49,165	1,559	50,313	-1,148	+50
28	0	71	351	13	31	435	1,365	+50	1,415	1,414	50,579	1,534	51,847	-1,268	+50

Col. 1 - Furnished by power company.
Col. 2 - Furnished by power company.
Col. 3 - Computed from index stations.
Col. 4 - Computed increase in runoff based on quantitative precipitation forecasts.
Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = Design rate - Col. 5, when positive; otherwise Col. 6 = 0.
Col. 7 = Col. 14 (4 days earlier).
Col. 8 = Design rate - Col. 5 + Col. 7, when positive; otherwise Col. 8 = 0.
Col. 9 = Col. 7 from Table 10.
Col. 10 = Summation of Col. 9.
Col. 11 = Design rate - (Col. 9 + Col. 10 from Table 9), when positive; otherwise Col. 11 = 0.
Col. 12 = Summation of Col. 11.
Col. 13 = Col. 10 - Col. 12.
Col. 14 = Col. 13 divided by -10, limited to ±50.

Table 8. New York City reservoir release design data—continued
(River Master daily operation record)

[ft³/s, cubic feet per second; (ft³/s)-d, cubic feet per second days; Col., Column]

Advance estimate of discharge of Delaware River at Montague, N.J. exclusive of New York City reservoir releases										Computation of balancing adjustment					
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Montague date	Discharge (ft³/s)	Indicated deficiency (ft³/s)	Balancing adjustment (ft³/s)	Directed release (ft³/s)	Adusted directed release		Actual deficiency		Cumulative difference (ft³/s)-d	Balancing adjustment (ft³/s)
	Lake Wallenpaupack (ft³/s)	Rio Reservoir (ft³/s)	Current condition (ft³/s)	Weather adjustment (ft³/s)						Daily (ft³/s)	Cumulative (ft³/s)-d	Daily (ft³/s)	Cumulative (ft³/s)-d		
2001	Col. 1	Col. 2	Col. 3	Col. 4		Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
Aug. 29	0	0	273	22	Sept. 1	295	1,505	+50	1,555	1,555	52,134	1,555	53,402	-1,268	+50
30	0	71	267	81	2	419	1,381	+50	1,431	1,429	53,563	1,379	54,781	-1,218	+50
31	0	0	273	262	3	535	1,265	+50	1,315	1,317	54,880	1,407	56,188	-1,308	+50
Sept. 1	0	72	398	0	4	470	1,330	+50	1,380	1,379	56,259	1,439	57,627	-1,368	+50
2	353	72	387	7	5	819	981	+50	1,031	1,031	57,290	1,021	58,648	-1,358	+50
3	391	72	311	12	6	786	1,014	+50	1,064	1,062	58,352	1,082	59,730	-1,378	+50
4	161	71	297	17	7	546	1,254	+50	1,304	1,301	59,653	861	60,591	-938	+50
5	418	0	360	0	8	778	1,022	+50	1,072	1,073	60,726	883	61,474	-748	+50
6	0	0	309	0	9	309	1,491	+50	1,541	1,542	62,268	1,442	62,916	-648	+50
7	0	71	298	0	10	369	1,431	+50	1,481	1,480	63,748	1,390	64,306	-558	+50
8	353	71	273	8	11	705	1,095	+50	1,145	1,147	64,895	1,047	65,353	-458	+46
9	353	71	246	24	12	694	1,106	+50	1,156	1,156	66,051	1,066	66,419	-368	+37
10	353	85	232	21	13	691	1,109	+50	1,159	1,158	67,209	1,198	67,617	-408	+41
11	353	89	347	9	14	798	1,002	+50	1,052	1,053	68,262	993	68,610	-348	+35
12	353	71	332	123	15	879	921	+46	967	968	69,230	758	69,368	-138	+14
13	0	0	335	181	16	516	1,284	+37	1,321	1,320	70,550	1,290	70,658	-108	+11
14	0	0	435	2	17	437	1,363	+41	1,404	1,398	71,948	1,448	72,106	-158	+16
15	257	0	417	0	18	674	1,126	+35	1,161	1,163	73,111	1,163	73,269	-158	+16
16	257	0	408	4	19	669	1,131	+14	1,145	1,146	74,257	1,116	74,385	-128	+13
17	257	48	367	0	20	672	1,128	+11	1,139	1,139	75,396	1,139	75,524	-128	+13
18	257	0	345	18	21	620	1,180	+16	1,196	1,197	76,593	627	76,151	+442	-44
19	257	0	327	63	22	647	1,153	+16	1,169	1,169	77,762	639	76,790	+972	-50
20	0	0	330	672	23	1,002	798	+13	811	811	78,573	851	77,641	+932	-50
21	0	71	880	24	24	975	825	+13	838	839	79,412	1,219	78,860	+552	-50
22	194	71	724	1,480	25	2,469	0	-44	0	0	79,412	338	79,198	+214	-21
The estimated discharge at Montague was greater than the Montague design rate from September 26, 2001 to September 28, 2001.															
26	194	0	1,747	65	29	2,006	0	-21	0	0	79,412	388	79,586	-174	+17
27	0	71	1,164	35	30	1,270	530	-21	509	510	79,922	970	80,556	-634	+50

Col. 1 - Furnished by power company.
Col. 2 - Furnished by power company.
Col. 3 - Computed from index stations.
Col. 4 - Computed increase in runoff based on quantitative precipitation forecasts.
Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = Design rate - Col. 5, when positive; otherwise Col. 6 = 0.
Col. 7 = Col. 14 (4 days earlier).
Col. 8 = Design rate - Col. 5 + Col. 7, when positive; otherwise Col. 8 = 0.
Col. 9 = Col. 7 from Table 10.
Col. 10 = Summation of Col. 9.
Col. 11 = Design rate - (Col. 9 + Col. 10 from Table 9), when positive; otherwise Col. 11 = 0.
Col. 12 = Summation of Col. 11.
Col. 13 = Col. 10 - Col. 12.
Col. 14 = Col. 13 divided by -10, limited to ±50.

Table 8. New York City reservoir release design data—continued
(River Master daily operation record)

[ft³/s, cubic feet per second; (ft³/s)-d, cubic feet per second days; Col., Column]

Advance estimate of discharge of Delaware River at Montague, N.J. exclusive of New York City reservoir releases										Computation of balancing adjustment					
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Montague date	Discharge (ft³/s)	Indicated deficiency (ft³/s)	Balancing adjustment (ft³/s)	Directed release (ft³/s)	Adusted directed release		Actual deficiency		Cumulative difference (ft³/s)-d	Balancing adjustment (ft³/s)
	Lake Wallenpaupack (ft³/s)	Rio Reservoir (ft³/s)	Current condition (ft³/s)	Weather adjustment (ft³/s)						Daily (ft³/s)	Cumulative (ft³/s)-d	Daily (ft³/s)	Cumulative (ft³/s)-d		
2001	Col. 1	Col. 2	Col. 3	Col. 4		Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
Sept. 28	0	0	935	9	Oct. 1	944	856	-21	835	838	80,760	1,018	81,574	-814	+50
29	130	0	817	0	2	947	853	-21	832	834	81,594	964	82,538	-944	+50
30	130	0	692	0	3	822	978	+17	995	993	82,587	973	83,511	-924	+50
Oct. 1	130	128	628	0	4	886	914	+50	964	964	83,551	994	84,505	-954	+50
2	130	96	577	0	5	803	997	+50	1,047	1,046	84,597	1,086	85,591	-994	+50
3	130	0	539	5	6	674	1,126	+50	1,176	1,171	85,768	1,061	86,652	-884	+50
4	0	0	415	169	7	584	1,216	+50	1,266	1,269	87,037	1,349	88,001	-964	+50
5	0	0	437	141	8	578	1,222	+50	1,272	1,270	88,307	1,390	89,391	-1,084	+50
6	41	0	443	113	9	597	1,203	+50	1,253	1,252	89,559	1,222	90,613	-1,054	+50
7	82	0	438	14	10	534	1,266	+50	1,316	1,318	90,877	1,418	92,031	-1,154	+50
8	0	0	425	0	11	425	1,375	+50	1,425	1,422	92,299	1,432	93,463	-1,164	+50
9	0	0	395	0	12	395	1,405	+50	1,455	1,455	93,754	1,435	94,898	-1,144	+50
10	0	64	350	15	13	429	1,371	+50	1,421	1,422	95,176	1,332	96,230	-1,054	+50
11	0	0	351	94	14	445	1,355	+50	1,405	1,407	96,583	1,447	97,677	-1,094	+50
12	0	64	346	172	15	582	1,218	+50	1,268	1,267	97,850	1,327	99,004	-1,184	+50
13	0	0	352	100	16	452	1,348	+50	1,398	1,397	99,247	1,347	100,351	-1,104	+50
14	0	64	347	79	17	490	1,310	+50	1,360	1,359	100,606	1,289	101,640	-1,034	+50
15	0	0	414	9	18	423	1,377	+50	1,427	1,427	102,033	1,347	102,987	-954	+50
16	0	0	469	69	19	538	1,262	+50	1,312	1,312	103,345	1,332	104,319	-974	+50
17	0	0	538	20	20	558	1,242	+50	1,292	1,292	104,637	1,332	105,651	-1,014	+50
18	0	0	536	0	21	536	1,264	+50	1,314	1,312	105,949	1,382	107,033	-1,084	+50
19	0	0	476	0	22	476	1,324	+50	1,374	1,376	107,325	1,436	108,469	-1,144	+50
20	0	0	452	10	23	462	1,338	+50	1,388	1,388	108,713	1,438	109,907	-1,194	+50
21	0	0	436	20	24	456	1,344	+50	1,394	1,393	110,106	1,463	111,370	-1,264	+50
22	0	0	366	165	25	531	1,269	+50	1,319	1,318	111,424	1,278	112,648	-1,224	+50
23	0	0	348	71	26	419	1,381	+50	1,431	1,431	112,855	1,301	113,949	-1,074	+50
24	0	0	431	68	27	499	1,301	+50	1,351	1,349	114,204	1,319	115,268	-1,064	+50
25	0	64	517	17	28	598	1,202	+50	1,252	1,252	115,456	1,302	116,570	-1,114	+50
26	0	0	484	0	29	484	1,316	+50	1,366	1,366	116,822	1,356	117,926	-1,104	+50
27	0	0	467	0	30	467	1,333	+50	1,383	1,381	118,203	1,391	119,317	-1,114	+50
28	0	0	443	0	31	443	1,357	+50	1,407	1,405	119,608	1,415	120,732	-1,124	+50

Col. 1 - Furnished by power company.
Col. 2 - Furnished by power company.
Col. 3 - Computed from index stations.
Col. 4 - Computed increase in runoff based on quantitative precipitation forecasts.
Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = Design rate - Col. 5, when positive; otherwise Col. 6 = 0.
Col. 7 = Col. 14 (4 days earlier).
Col. 8 = Design rate - Col. 5 + Col. 7, when positive; otherwise Col. 8 = 0.
Col. 9 = Col. 7 from Table 10.
Col. 10 = Summation of Col. 9.
Col. 11 = Design rate - (Col. 9 + Col. 10 from Table 9), when positive; otherwise Col. 11 = 0.
Col. 12 = Summation of Col. 11.
Col. 13 = Col. 10 - Col. 12.
Col. 14 = Col. 13 divided by -10, limited to ±50.

Table 8. New York City reservoir release design data—continued (River Master daily operation record)

[ft³/s, cubic feet per second; (ft³/s)-d, cubic feet per second days; Col., Column]

Advance estimate of discharge of Delaware River at Montague, N.J. exclusive of New York City reservoir releases										Computation of balancing adjustment					
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Montague date	Discharge (ft³/s)	Indicated deficiency (ft³/s)	Balancing adjustment (ft³/s)	Directed release (ft³/s)	Adusted directed release		Actual deficiency		Cumulative difference (ft³/s)-d	Balancing adjustment (ft³/s)
	Lake Wallenpaupack (ft³/s)	Rio Reservoir (ft³/s)	Current condition (ft³/s)	Weather adjustment (ft³/s)						Daily (ft³/s)	Cumulative (ft³/s)-d	Daily (ft³/s)	Cumulative (ft³/s)-d		
2001	Col. 1	Col. 2	Col. 3	Col. 4		Col. 5	Col. 6	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13	Col. 14
Montague Design Rate = 1,550 ft³/s -- November 1,2001 to November 6, 2001															
Oct. 29	0	0	388	0	Nov. 1	388	1,267	-	1,267	1,269	1,269	1,274	1,274	-5	0
30	0	0	405	10	2	415	1,240	-	1,240	1,239	2,508	1,184	2,458	+50	-5
31	0	0	392	17	3	409	1,246	-	1,246	1,243	3,751	1,138	3,596	+155	-16
Nov. 1	0	0	386	62	4	448	1,207	-	1,207	1,203	4,954	1,178	4,774	+180	-18
2	0	96	382	64	5	542	1,113	0	1,113	1,109	6,063	1,124	5,898	+165	-17
3	97	0	386	17	6	500	1,155	-5	1,150	1,142	7,205	1,007	6,905	+300	-30
Montague Design Rate = 1,550 ft³/s -- November 7,2001 to November 30, 2001															
4	0	0	381	25	7	405	1,144	-	1,144	1,142	1,142	1,062	1,062	+80	-8
5	0	0	427	12	8	439	1,111	-	1,111	1,111	2,253	1,041	2,103	+150	-15
6	0	97	426	16	9	539	1,011	-	1,011	1,014	3,267	1,024	3,127	+140	-14
7	0	0	415	32	10	447	1,103	-	1,103	1,103	4,370	1,013	4,140	+230	-23
8	0	0	434	31	11	465	1,085	-8	1,077	1,077	5,447	1,067	5,207	+240	-24
9	0	0	461	7	12	468	1,082	-15	1,067	1,068	6,515	1,098	6,305	+210	-21
10	0	0	473	2	13	475	1,075	-14	1,061	1,061	7,576	1,071	7,376	+200	-20
11	0	0	474	0	14	474	1,076	-23	1,053	1,056	8,632	1,116	8,492	+140	-14
12	0	0	471	0	15	471	1,079	-24	1,055	1,055	9,687	1,065	9,557	+130	-13
13	0	0	442	0	16	442	1,108	-21	1,087	1,086	10,773	1,126	10,683	+90	-9
14	0	0	428	3	17	431	1,119	-20	1,099	1,098	11,871	1,078	11,761	+110	-11
15	0	0	429	11	18	440	1,110	-14	1,096	1,095	12,966	1,135	12,896	+70	-7
16	0	0	428	0	19	428	1,122	-13	1,109	1,111	14,077	1,161	14,057	+20	-2
17	0	0	424	42	20	466	1,084	-9	1,075	1,077	15,154	1,157	15,214	-60	+6
18	0	0	414	44	21	458	1,092	-11	1,081	1,082	16,236	1,142	16,356	-120	+12
19	0	0	407	42	22	449	1,101	-7	1,094	1,093	17,329	1,143	17,499	-170	+17
20	0	0	409	0	23	409	1,141	-2	1,139	1,137	18,466	1,167	18,666	-200	+20
21	0	0	416	0	24	416	1,134	+6	1,140	1,140	19,606	1,180	19,846	-240	+24
22	0	0	413	0	25	413	1,137	+12	1,149	1,152	20,758	1,132	20,978	-220	+22
23	0	64	411	84	26	559	991	+17	1,008	1,010	21,768	980	21,958	-190	+19
24	0	64	395	225	27	684	866	+20	886	887	22,655	667	22,625	+30	-3
25	0	64	421	361	28	846	704	+24	728	728	23,383	578	23,203	+180	-18
26	0	0	1,021	55	29	1,076	474	+22	496	497	23,880	607	23,810	+70	-7
27	0	0	916	77	30	993	557	+19	576	576	24,456	666	24,476	-20	+2

Col. 1 - Furnished by power company.
Col. 2 - Furnished by power company.
Col. 3 - Computed from index stations.
Col. 4 - Computed increase in runoff based on quantitative precipitation forecasts.
Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = Design rate - Col. 5, when positive; otherwise Col. 6 = 0.
Col. 7 = Col. 14 (4 days earlier).
Col. 8 = Design rate - Col. 5 + Col. 7, when positive; otherwise Col. 8 = 0.
Col. 9 = Col. 7 from Table 10.
Col. 10 = Summation of Col. 9.
Col. 11 = Design rate - (Col. 9 + Col. 10 from Table 9), when positive; otherwise Col. 11 = 0.
Col. 12 = Summation of Col. 11.
Col. 13 = Col. 10 - Col. 12.
Col. 14 = Col. 13 divided by -10, limited to ±50.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, N.J. (River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow Delaware River at Montague, N.J.							
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallen-paupack	Rio Reservoir	Date	Controlled Releases			Computed uncon-tolled	Total	Excess Release Credits	
									N.Y.C. Reservoirs		Power-plants				
Date	Amount								Directed	Other				Daily	Cumul.
2000	Col. 1	Col. 2	Col. 3	Col. 4	2000	Col. 5	Col. 6	2000	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13
Nov. 28	0	45	45	25	Nov. 30	4	142	Dec. 1	0	115	146	2,639	202,900	0	6,001
29	0	45	45	25	Dec. 1	0	92	2	0	115	92	2,533	2,740	0	6,001
30	0	45	45	25	2	0	85	3	0	115	85	2,240	2,440	0	6,001
Dec. 1	0	45	45	25	3	0	138	4	0	115	138	1,827	2,080	0	6,001
2	0	45	45	25	4	0	67	5	0	115	67	1,778	1,960	0	6,001
3	0	45	45	25	5	0	46	6	0	115	46	1,969	2,130	0	6,001
4	0	45	43	25	6	46	71	7	0	113	117	1,870	2,100	0	6,001
5	0	45	43	25	7	184	85	8	0	113	269	1,718	2,100	0	6,001
6	0	45	43	25	8	0	89	9	0	113	89	1,698	1,900	23	6,024
7	0	45	45	25	9	0	82	10	0	115	82	1,603	1,800	50	6,074
8	0	45	43	25	10	0	82	11	0	113	82	1,795	1,990	0	6,074
9	0	45	45	25	11	0	53	12	0	115	53	2,012	2,180	0	6,074
10	0	45	43	25	12	230	74	13	0	113	304	1,753	2,170	0	6,074
11	0	45	45	25	13	173	85	14	0	115	258	1,727	2,100	0	6,074
12	0	45	45	25	14	193	124	15	0	115	317	1,898	2,330	0	6,074
13	0	45	43	25	15	181	113	16	0	113	294	1,823	2,330	0	6,074
14	0	45	43	25	16	0	135	17	0	113	135	11,352	11,600	0	6,074
15	0	45	43	25	17	221	465	18	0	113	686	45,501	46,300	0	6,074
16	0	45	57	25	18	162	337	19	0	127	499	20,774	21,400	0	6,074
17	0	45	51	25	19	118	461	20	0	121	579	14,200	14,900	0	6,074
18	0	45	45	25	20	185	457	21	0	115	642	11,043	11,800	0	6,074
19	0	45	46	25	21	181	716	22	0	116	897	9,287	10,300	0	6,074
20	0	46	46	25	22	188	475	23	0	117	663	8,050	8,830	0	6,074
21	0	46	46	25	23	158	443	24	0	117	601	7,052	7,770	0	6,074
22	0	45	46	25	24	190	450	25	0	116	640	6,184	6,940	0	6,074
23	0	45	46	25	25	169	387	26	0	116	556	5,398	6,070	0	6,074
24	0	45	46	25	26	178	209	27	0	116	387	4,877	5,380	0	6,074
25	0	45	46	25	27	166	92	28	0	116	258	4,916	5,290	0	6,074
26	0	45	46	25	28	240	248	29	0	116	488	4,836	5,440	0	6,074
27	0	45	45	25	29	156	191	30	0	115	347	3,908	4,390	0	6,074
28	0	45	45	25	30	0	259	31	0	115	259	3,646	4,020	0	6,074
Total	0	1,397	1,405	775		3,323	6,753		0	3,577	10,076	191,907	205,560		

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.

Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.

Col. 12 = Col. 11 - Col. 8 - 1,750 ft3/s computed algebraically, but not greater than Col. 7; except that part of Col. 8 contributing to the excess-release increment of Col. 11.
Col. 13 = Season limit of cumulative credit beginning June 15, 2000 = 13,556 (ft^3/s)-d. One half of this quantity [6,778 (ft^3/s)-d] available for release.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, N.J.—continued (River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow Delaware River at Montague, N.J.							
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallenpaupack	Rio Reservoir	Date	Controlled Releases			Computed uncontolled	Total	Excess Release Credits	
									N.Y.C. Reservoirs		Powerplants				
Date	Amount								Directed	Other				Daily	Cumul.
2000/2001	Col. 1	Col. 2	Col. 3	Col. 4	2000/2001	Col. 5	Col. 6	2001	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13
Dec. 29	0	45	45	25	Dec. 31	0	220	Jan. 1	0	115	220	4,345	4,680	0	6,074
30	0	45	45	26	Jan. 1	0	277	2	0	116	277	3,807	4,200	0	6,074
31	0	46	45	26	2	161	174	3	0	117	335	3,448	3,900	0	6,074
Jan. 1	0	46	46	26	3	209	50	4	0	118	259	3,223	3,600	0	6,074
2	0	46	46	25	4	185	85	5	0	117	270	3,413	3,800	0	6,074
3	0	45	46	25	5	178	106	6	0	116	284	3,400	3,800	0	6,074
4	0	45	46	25	6	0	96	7	0	116	96	3,088	3,300	0	6,074
5	0	45	46	25	7	0	241	8	0	116	241	2,743	3,100	0	6,074
6	0	45	46	25	8	209	206	9	0	116	415	2,569	3,100	0	6,074
7	0	45	46	25	9	178	301	10	0	116	479	2,505	3,100	0	6,074
8	0	45	46	25	10	139	337	11	0	116	476	2,108	2,700	0	6,074
9	0	46	46	25	11	307	259	12	0	117	566	1,817	2,500	0	6,074
10	0	45	46	25	12	249	294	13	0	116	543	1,941	2,600	0	6,074
11	0	45	46	25	13	0	294	14	0	116	294	1,890	2,300	0	6,074
12	0	45	46	25	14	0	298	15	0	116	298	1,886	2,300	0	6,074
13	0	45	46	25	15	154	67	16	0	116	221	1,863	2,200	0	6,074
14	0	45	46	25	16	177	82	17	0	116	259	1,925	2,300	0	6,074
15	0	45	46	25	17	180	85	18	0	116	265	1,919	2,300	0	6,074
16	0	45	45	25	18	189	149	19	0	115	338	1,947	2,400	0	6,074
17	0	45	45	25	19	180	110	20	0	115	290	1,895	2,300	0	6,074
18	0	45	43	25	20	0	131	21	0	113	131	1,856	2,100	0	6,074
19	0	45	43	25	21	0	213	22	0	113	213	1,874	2,200	0	6,074
20	0	45	43	25	22	177	117	23	0	113	294	1,693	2,100	0	6,074
21	0	45	43	25	23	203	202	24	0	113	405	1,882	2,400	0	6,074
22	0	45	43	25	24	192	195	25	0	113	387	1,700	2,200	0	6,074
23	0	45	43	25	25	220	167	26	0	113	387	1,900	2,400	0	6,074
24	0	45	43	25	26	224	145	27	0	113	369	1,718	2,200	0	6,074
25	0	45	45	25	27	0	163	28	0	115	163	1,622	1,900	25	6,099
26	0	43	40	25	28	0	149	29	0	108	149	1,543	1,800	50	6,149
27	0	43	39	25	29	199	167	30	0	107	366	1,627	2,100	0	6,149
28	0	43	46	25	30	180	184	31	0	114	364	1,722	2,200	0	6,149
Total	0	1,393	1,386	778		4,090	5,564		0	3,557	9,654	70,869	84,080		

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.

Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.

Col. 12 = Col. 11 - Col. 8 - 1,750 ft3/s computed algebraically, but not greater than Col. 7; except that part of Col. 8 contributing to the excess-release increment of Col. 11.
Col. 13 = Season limit of cumulative credit beginning June 15, 2000 = 13,556 (ft^3/s)-d. One half of this quantity [6,778 (ft^3/s)-d] available for release.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, N.J.—continued (River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow Delaware River at Montague, N.J.							
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallen-paupack	Rio Reservoir	Date	Controlled Releases			Computed uncon-tolled	Total	Excess Release Credits	
									N.Y.C. Reservoirs		Power-plants				
Date	Amount								Directed	Other				Daily	Cumul.
2001	Col. 1	Col. 2	Col. 3	Col. 4	2001	Col. 5	Col. 6	2001	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13
Jan. 29	0	43	45	25	Jan. 31	186	227	Feb. 1	0	113	413	2,374	2,900	0	6,149
30	0	45	45	25	Feb. 1	270	124	2	0	115	394	2,891	3,400	0	6,149
31	0	46	45	25	2	264	121	3	0	116	385	2,999	3,500	0	6,149
Feb. 1	0	45	45	25	3	0	89	4	0	115	89	2,596	2,800	0	6,149
2	0	45	45	25	4	0	32	5	0	115	32	2,553	2,700	0	6,149
3	0	46	43	25	5	161	138	6	0	114	299	2,487	2,900	0	6,149
4	0	45	43	25	6	161	156	7	0	113	317	2,370	2,800	0	6,149
5	0	43	43	25	7	220	284	8	0	111	504	2,185	2,800	0	6,149
6	0	43	43	25	8	217	156	9	0	111	373	2,216	2,700	0	6,149
7	0	45	45	25	9	162	71	10	0	115	233	2,452	2,800	0	6,149
8	0	45	45	25	10	224	67	11	0	115	291	3,744	4,150	0	6,149
9	0	46	45	25	11	324	124	12	0	116	448	4,136	4,700	0	6,149
10	0	46	45	25	12	309	71	13	0	116	380	3,504	4,000	0	6,149
11	0	46	45	25	13	323	135	14	0	116	458	3,226	3,800	0	6,149
12	0	45	43	25	14	307	138	15	0	113	445	3,542	4,100	0	6,149
13	0	45	45	25	15	361	113	16	0	115	474	4,521	5,110	0	6,149
14	0	45	45	25	16	240	53	17	0	115	293	4,612	5,020	0	6,149
15	0	45	45	25	17	182	60	18	0	115	242	4,213	4,570	0	6,149
16	0	46	45	25	18	286	135	19	0	116	421	3,673	4,210	0	6,149
17	0	46	45	25	19	230	131	20	0	116	361	3,453	3,930	0	6,149
18	0	46	45	25	20	288	188	21	0	116	476	3,628	4,220	0	6,149
19	0	46	45	25	21	295	167	22	0	116	462	3,632	4,210	0	6,149
20	0	45	45	25	22	364	227	23	0	115	591	2,994	3,700	0	6,149
21	0	45	45	25	23	230	188	24	0	115	418	3,047	3,580	0	6,149
22	0	45	45	25	24	160	206	25	0	115	366	3,159	3,640	0	6,149
23	0	46	45	25	25	221	238	26	0	116	459	3,535	4,110	0	6,149
24	0	46	45	25	26	327	142	27	0	116	469	3,915	4,500	0	6,149
25	0	43	45	25	27	360	28	28	0	113	388	3,789	4,290	0	6,149
Total	0	1,263	1,250	700		6,672	3,809		0	3,213	10,481	91,446	105,140	0	

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.
Col. 12 = Col. 11 - Col. 8 - 1,750 ft3/s computed algebraically, but not greater than Col. 7; except that part of Col. 8 contributing to the excess-release increment of Col. 11.
Col. 13 = Season limit of cumulative credit beginning June 15, 2000 = 13,556 (ft^3/s)-d. One half of this quantity [6,778 (ft^3/s)-d] available for release.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, N.J.—continued (River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow Delaware River at Montague, N.J.							
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallen-paupack	Rio Reservoir	Date	Controlled Releases			Computed uncon-tolled	Total	Excess Release Credits	
									N.Y.C. Reservoirs		Power-plants				
Date	Amount								Directed	Other				Daily	Cumul.
2001	Col. 1	Col. 2	Col. 3	Col. 4	2001	Col. 5	Col. 6	2001	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13
Feb. 26	0	45	45	25	Feb. 28	293	32	Mar. 1	0	115	325	3,350	3,790	0	6,149
27	0	45	46	25	Mar. 1	278	74	2	0	116	352	3,182	3,650	0	6,149
28	0	45	46	25	2	244	35	3	0	116	279	3,065	3,460	0	6,149
Mar. 1	0	45	46	25	3	213	32	4	0	116	245	2,969	3,330	0	6,149
2	0	45	48	25	4	263	92	5	0	118	355	2,897	3,370	0	6,149
3	0	45	48	25	5	550	39	6	0	118	589	2,783	3,490	0	6,149
4	0	45	48	25	6	554	67	7	0	118	621	2,821	3,560	0	6,149
5	0	45	48	25	7	471	71	8	0	118	542	2,900	3,560	0	6,149
6	0	45	46	25	8	501	78	9	0	116	579	2,885	3,580	0	6,149
7	0	45	46	25	9	599	71	10	0	116	670	2,634	3,420	0	6,149
8	0	45	46	25	10	223	71	11	0	116	294	2,490	2,900	0	6,149
9	0	46	48	25	11	206	71	12	0	119	277	2,314	2,710	0	6,149
10	0	46	48	25	12	556	71	13	0	119	627	2,734	3,480	0	6,149
11	0	46	48	25	13	470	67	14	0	119	537	3,854	4,510	0	6,149
12	0	46	48	25	14	570	0	15	0	119	570	4,021	4,710		
13	0	43	48	25	15	569	0	16	0	116	569	3,965	4,650		
14	0	43	46	25	16	465	0	17	0	114	465	4,271	4,850		
15	0	45	46	25	17	0	0	18	0	116	0	4,834	4,950		
16	0	45	46	25	18	98	53	19	0	116	151	5,093	5,360		
17	0	45	46	25	19	482	124	20	0	116	606	4,958	5,680		
18	0	45	46	25	20	561	131	21	0	116	692	5,772	6,580		
19	0	45	46	25	21	553	177	22	0	116	730	9,754	10,600		
20	0	45	45	25	22	597	340	23	0	115	937	14,948	16,600		
21	0	45	43	25	23	454	174	24	0	113	628	14,459	15,200		
22	0	45	45	25	24	0	241	25	0	115	241	12,444	12,800		
23	0	46	45	25	25	107	450	26	0	116	557	10,427	11,100		
24	0	46	46	25	26	664	528	27	0	117	1,192	8,441	9,750		
25	0	46	48	25	27	663	447	28	0	119	1,110	7,411	8,640		
26	0	45	48	25	28	636	521	29	0	118	1,157	6,905	8,180		
27	0	45	48	25	29	790	507	30	0	118	1,297	10,685	12,100		
28	0	45	50	25	30	557	532	31	0	120	1,089	24,391	25,600		
Total	0	1,398	1,447	775		13,187	5,096		0	3,620	18,283	193,657	215,560		

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.
Col. 12 = Col. 11 - Col. 8 - 1,750 ft3/s computed algebraically, but not greater than Col. 7; except that part of Col. 8 contributing to the excess-release increment of Col. 11.
Col. 13 = Season limit of cumulative credit beginning June 15, 2000 = 13,556 (ft^3/s)-d. One half of this quantity [6,778 (ft^3/s)-d] available for release.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, N.J.—continued (River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow Delaware River at Montague, N.J.							
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallenpaupack	Rio Reservoir	Date	Controlled Releases			Computed uncontolled	Total	Excess Release Credits	
									N.Y.C. Reservoirs		Powerplants				
Date	Amount								Directed	Other				Daily	Cumul.
2001	Col. 1	Col. 2	Col. 3	Col. 4	2001	Col. 5	Col. 6	2001	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13
Mar. 29	0	45	45	25	Mar. 31	0	773	Apr. 1	0	115	773	18,312	19,200		
30	0	45	45	23	Apr. 1	24	699	2	0	113	723	14,464	15,300		
31	0	43	43	25	2	679	759	3	0	111	1,438	12,051	13,600		
Apr. 1	0	45	45	25	3	672	766	4	0	115	1,438	11,547	13,100		
2	0	45	45	25	4	701	723	5	0	115	1,424	12,261	13,800		
3	0	45	45	25	5	749	762	6	0	115	1,511	13,774	15,400		
4	0	45	45	25	6	737	766	7	0	115	1,503	14,582	16,200		
5	0	45	46	25	7	677	752	8	0	116	1,429	17,955	19,500		
6	0	45	46	25	8	613	813	9	0	116	1,426	20,858	22,400		
7	0	46	46	25	9	846	926	10	0	117	1,772	32,811	34,700		
8	0	46	46	25	10	990	848	11	0	117	1,838	33,845	35,800		
9	0	43	45	25	11	1,724	816	12	0	113	2,540	26,847	29,500		
10	0	45	45	25	12	1,724	869	13	0	115	2,593	23,492	26,200		
11	0	46	45	23	13	1,141	897	14	0	114	2,038	21,048	23,200		
12	0	45	45	25	14	0	809	15	0	115	809	17,876	18,800		
13	0	45	46	25	15	121	734	16	0	116	855	15,129	16,100		
14	0	45	46	25	16	1,199	252	17	0	116	1,451	13,433	15,000		
15	0	46	46	25	17	930	270	18	0	117	1,200	11,883	13,200		
16	0	46	45	25	18	888	262	19	0	116	1,150	10,434	11,700		
17	0	45	45	26	19	919	270	20	0	116	1,189	8,895	10,200		
18	0	45	45	26	20	711	262	21	0	116	973	7,371	8,460		
19	0	45	45	26	21	0	230	22	0	116	230	7,274	7,620		
20	0	45	45	26	22	0	238	23	0	116	238	7,066	7,420		
21	0	45	45	25	23	697	298	24	0	115	995	6,210	7,320		
22	0	45	45	25	24	680	287	25	0	115	967	5,398	6,480		
23	0	45	45	25	25	697	216	26	0	115	913	4,852	5,880		
24	0	45	45	25	26	583	234	27	0	115	817	4,258	5,190		
25	0	45	45	25	27	467	110	28	0	115	577	3,638	4,330		
26	0	45	45	25	28	0	0	29	0	115	0	3,385	3,500		
27	0	45	45	25	29	0	223	30	0	115	223	3,132	3,470		
Total	0	1,351	1,355	750		19,169	15,864		0	3,456	35,033	404,081	442,570		

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.
Col. 12 = Col. 11 - Col. 8 - 1,750 ft3/s computed algebraically, but not greater than Col. 7; except that part of Col. 8 contributing to the excess-release increment of Col. 11.
Col. 13 = Season limit of cumulative credit beginning June 15, 2000 = 13,556 (ft^3/s)-d. One half of this quantity [6,778 (ft^3/s)-d] available for release.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, N.J.—continued (River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow Delaware River at Montague, N.J.							
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallen-paupack	Rio Reservoir	Date	Controlled Releases			Computed uncon-tolled	Total	Excess Release Credits	
									N.Y.C. Reservoirs		Power-plants				
Date	Amount								Directed	Other				Daily	Cumul.
2001	Col. 1	Col. 2	Col. 3	Col. 4	2001	Col. 5	Col. 6	2001	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13
Apr. 28	0	45	46	25	Apr. 30	429	241	May 1	0	116	670	2,914	3,700		
29	0	45	46	32	May 1	351	298	2	0	123	649	2,718	3,490		
30	0	50	46	53	2	368	238	3	0	149	606	2,675	3,430		
May 1	0	70	48	53	3	360	376	4	0	171	736	2,393	3,300		
2	0	70	48	51	4	447	238	5	0	169	685	2,166	3,020		
3	0	70	48	53	5	0	160	6	0	171	160	1,999	2,330		
4	0	70	14	51	6	0	199	7	0	135	199	1,956	2,290		
5	0	70	0	53	7	0	277	8	0	123	277	1,900	2,300		
6	0	70	0	53	8	0	262	9	0	123	262	1,855	2,240		
7	0	70	0	53	9	0	174	10	0	123	174	1,763	2,060		
8	0	70	0	53	10	0	0	11	0	123	0	1,787	1,910		
9	0	70	20	51	11	0	103	12	0	141	103	1,676	1,920		
10	264	70	145	53	12	0	96	13	268	0	96	1,476	1,840		
11	0	70	46	53	13	0	14	14	0	169	14	1,497	1,680		
12	250	70	130	53	14	0	32	15	253	0	32	1,235	1,520		
13	324	70	201	53	15	0	0	16	324	0	0	1,176	1,500		
14	490	70	370	53	16	0	0	17	493	0	0	1,137	1,630		
15	495	70	377	53	17	0	0	18	500	0	0	1,210	1,710		
16	631	70	509	53	18	0	0	19	632	0	0	1,238	1,870		
17	721	70	600	53	19	0	0	20	723	0	0	1,217	1,940		
18	729	70	606	53	20	0	0	21	729	0	0	1,161	1,890		
19	766	70	644	53	21	0	0	22	767	0	0	1,323	2,090		
20	264	70	142	53	22	0	0	23	265	0	0	2,335	2,600		
21	0	70	45	51	23	0	0	24	0	166	0	2,924	3,090		
22	0	70	46	53	24	0	0	25	0	169	0	2,711	2,880		
23	0	70	46	53	25	0	67	26	0	169	67	2,354	2,590		
24	0	70	46	53	26	0	0	27	0	169	0	3,291	3,460		
25	0	70	45	53	27	0	0	28	0	168	0	4,562	4,730		
26	0	70	45	53	28	0	0	29	0	168	0	4,712	4,880		
27	0	70	45	53	29	0	0	30	0	168	0	3,832	4,000		
28	0	70	88	53	30	0	0	31	0	211	0	3,049	3,260		
Total	4,934	2,100	4,492	1,586		1,955	2,775		4,954	3,224	4,730	68,242	81,150		

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.
Col. 12 = Col. 11 - Col. 8 - 1,750 ft3/s computed algebraically, but not greater than Col. 7; except that part of Col. 8 contributing to the excess-release increment of Col. 11.
Col. 13 = Season limit of cumulative credit beginning June 15, 2000 = 13,556 (ft^3/s)-d. One half of this quantity [6,778 (ft^3/s)-d] available for release.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, N.J.—continued (River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow Delaware River at Montague, N.J.							
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallen-paupack	Rio Reservoir	Date	Controlled Releases			Computed uncon-tolled	Total	Excess Release Credits	
									N.Y.C. Reservoirs		Power-plants				
Date	Amount								Directed	Other				Daily	Cumul.
2001	Col. 1	Col. 2	Col. 3	Col. 4	2001	Col. 5	Col. 6	2001	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13
May 29	0	70	161	53	May 31	0	67	June 1	0	284	67	2,589	2,940		
30	0	70	159	53	June 1	0	103	2	0	282	103	3,345	3,730		
31	0	74	161	53	2	0	0	3	0	288	0	6,512	6,800		
June 1	0	94	162	53	3	0	85	4	0	309	85	7,196	7,590		
2	0	94	161	53	4	0	53	5	0	308	53	5,849	6,210		
3	0	94	161	53	5	0	85	6	0	308	85	4,627	5,020		
4	0	94	161	53	6	0	152	7	0	308	152	3,840	4,300		
5	0	94	161	53	7	0	106	8	0	308	106	3,346	3,760		
6	0	94	159	53	8	0	117	9	0	306	117	2,817	3,240		
7	0	94	159	53	9	0	106	10	0	306	106	2,488	2,900		
8	0	94	159	53	10	0	43	11	0	306	43	2,281	2,630		
9	0	94	159	53	11	498	160	12	0	306	658	2,276	3,240		
10	0	94	159	53	12	423	174	13	0	306	597	2,277	3,180		
11	0	96	159	53	13	391	138	14	0	308	529	2,083	2,920		
12	0	94	278	68	14	432	67	15	0	440	499	1,821	2,760	0	0
13	0	94	367	93	15	508	71	16	0	554	579	1,667	2,800	0	0
14	0	94	487	108	16	331	138	17	0	689	469	3,402	4,560	0	0
15	0	94	475	85	17	449	0	18	0	654	449	5,207	6,310	0	0
16	0	110	371	53	18	419	78	19	0	534	497	3,759	4,790	0	0
17	0	94	357	63	19	396	106	20	0	514	502	2,814	3,830	0	0
18	0	102	424	70	20	484	191	21	0	596	675	2,559	3,830	0	0
19	0	97	384	53	21	404	113	22	0	534	517	2,369	3,420	0	0
20	0	94	238	53	22	528	181	23	0	385	709	2,256	3,350	0	0
21	0	94	159	53	23	408	128	24	0	306	536	2,408	3,250	0	0
22	0	94	158	51	24	360	53	25	0	303	413	2,374	3,090	0	0
23	0	94	158	53	25	329	32	26	0	305	361	2,334	3,000	0	0
24	0	94	232	53	26	503	149	27	0	379	652	1,949	2,980	0	0
25	0	94	362	57	27	487	121	28	0	513	608	1,749	2,870	0	0
26	0	94	517	80	28	424	301	29	0	691	725	1,584	3,000	0	0
27	0	96	616	94	29	409	156	30	0	806	565	1,479	2,850	0	0
Total	0	2,783	7,824	1,829		8,183	3,274		0	12,436	11,457	91,257	115,150		

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.
Col. 12 = Col. 11 - Col. 8 - 1,750 ft3/s computed algebraically, but not greater than Col. 7; except that part of Col. 8 contributing to the excess-release increment of Col. 11.
Col. 13 = Season limit of cumulative credit beginning June 15, 2000 = 13,556 (ft^3/s)-d. One half of this quantity [6,778 (ft^3/s)-d] available for release.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, N.J.—continued (River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow Delaware River at Montague, N.J.							
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallen-paupack	Rio Reservoir	Date	Controlled Releases			Computed uncon-tolled	Total	Excess Release Credits	
									N.Y.C. Reservoirs		Power-plants				
Date	Amount								Directed	Other				Daily	Cumul.
2001	Col. 1	Col. 2	Col. 3	Col. 4	2001	Col. 5	Col. 6	2001	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13
June 28	132	108	543	94	June 30	321	152	July 1	132	613	473	1,452	2,670	132	132
29	415	110	481	94	July 1	0	39	2	415	270	39	1,256	1,980	50	182
30	58	110	500	88	2	445	113	3	58	640	558	1,324	2,580	58	240
July 1	0	108	275	51	3	462	145	4	0	434	607	1,229	2,270	0	240
2	297	94	159	53	4	39	57	5	297	9	96	1,148	1,550	-200	40
3	0	94	159	53	5	326	121	6	0	306	447	1,107	1,860	50	90
4	0	94	159	53	6	579	174	7	0	306	753	1,001	2,060	46	136
5	565	94	415	54	7	0	152	8	563	0	152	955	1,670	-80	56
6	551	94	404	53	8	0	57	9	551	0	57	1,142	1,750	0	56
7	174	94	159	56	9	433	259	10	174	135	692	1,279	2,280	174	230
8	135	94	261	74	10	411	103	11	135	294	514	1,207	2,150	106	336
9	51	94	302	57	11	467	78	12	51	402	545	1,222	2,200	51	387
10	100	94	234	53	12	432	92	13	100	281	524	1,065	1,970	50	437
11	132	94	159	53	13	443	110	14	132	174	553	931	1,790	40	477
12	668	94	520	53	14	56	35	15	667	0	91	732	1,490	-260	217
13	787	94	640	53	15	40	74	16	787	0	114	789	1,690	-60	157
14	490	94	342	53	16	450	103	17	489	0	553	798	1,840	90	247
15	481	94	333	53	17	483	89	18	480	0	572	718	1,770	20	267
16	538	94	391	53	18	474	67	19	538	0	541	691	1,770	20	287
17	587	94	441	56	19	440	60	20	588	3	500	609	1,700	-50	237
18	608	94	439	74	20	395	103	21	607	0	498	645	1,750	0	237
19	1,095	94	927	90	21	32	0	22	1,111	0	32	467	1,610	-140	97
20	1,102	94	917	90	22	77	21	23	1,101	0	98	551	1,750	0	97
21	685	94	501	90	23	458	216	24	685	0	674	561	1,920	170	267
22	665	94	524	90	24	469	220	25	665	43	689	503	1,900	107	374
23	745	121	538	90	25	388	330	26	749	0	718	483	1,950	200	574
24	853	125	634	88	26	370	142	27	847	0	512	591	1,950	200	774
25	892	125	676	53	27	432	89	28	854	0	521	655	2,030	280	1,054
26	1,308	93	1,157	53	28	0	53	29	1,303	0	53	484	1,840	90	1,144
27	1,276	94	1,129	53	29	0	21	30	1,276	0	21	403	1,700	-50	1,094
28	958	94	811	53	30	354	0	31	958	0	354	468	1,780	30	1,124
Total	16,348	3,062	15,130	2,031		9,276	3,275		16,313	3,910	12,551	26,466	59,240		

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.
Col. 12 = Col. 11 - Col. 8 - 1,750 ft3/s computed algebraically, but not greater than Col. 7; except that part of Col. 8 contributing to the excess-release increment of Col. 11.
Col. 13 = Season limit of cumulative credit beginning June 15, 2000 = 13,556 (ft^3/s)-d. One half of this quantity [6,778 (ft^3/s)-d] available for release.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, N.J.—continued (River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow Delaware River at Montague, N.J.							
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallen-paupack	Rio Reservoir	Date	Controlled Releases			Computed uncon-tolled	Total	Excess Release Credits	
									N.Y.C. Reservoirs		Power-plants				
Date	Amount								Directed	Other				Daily	Cumul.
2001	Col. 1	Col. 2	Col. 3	Col. 4	2001	Col. 5	Col. 6	2001	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13
July 29	1,013	94	863	53	July 31	303	53	Aug. 1	1,010	0	356	394	1,760	10	1,134
30	1,043	94	874	74	Aug. 1	324	67	2	1,042	0	391	397	1,830	80	1,214
31	935	94	744	94	2	377	32	3	932	0	409	449	1,790	40	1,254
Aug. 1	862	124	645	94	3	372	14	4	863	0	386	531	1,780	30	1,284
2	1,243	125	1,023	94	4	0	67	5	1,242	0	67	591	1,900	150	1,434
3	1,120	99	927	94	5	0	18	6	1,120	0	18	502	1,640	-110	1,324
4	1,044	94	857	94	6	354	149	7	1,045	0	503	432	1,980	230	1,554
5	1,004	94	811	94	7	391	348	8	999	0	739	412	2,150	400	1,954
6	953	125	733	94	8	400	606	9	952	0	1,006	382	2,340	590	2,544
7	1,037	125	820	94	9	367	695	10	1,039	0	1,062	299	2,400	650	3,194
8	896	125	678	94	10	351	340	11	897	0	691	382	1,970	220	3,414
9	1,269	125	1,067	74	11	0	85	12	1,266	0	85	509	1,860	110	3,524
10	1,232	125	1,052	54	12	0	35	13	1,231	0	35	574	1,840	90	3,614
11	1,012	94	866	53	13	90	32	14	1,013	0	122	555	1,690	-60	3,554
12	943	94	795	53	14	178	0	15	942	0	178	530	1,650	-100	3,454
13	999	94	851	53	15	179	0	16	998	0	179	483	1,660	-90	3,364
14	992	94	843	53	16	224	50	17	990	0	274	456	1,720	-30	3,334
15	999	94	829	74	17	208	99	18	997	0	307	566	1,870	120	3,454
16	1,304	94	1,134	74	18	0	0	19	1,302	0	0	528	1,830	80	3,534
17	1,151	94	976	74	19	0	0	20	1,144	0	0	496	1,640	-110	3,424
18	885	94	716	74	20	138	32	21	884	0	170	536	1,590	-160	3,264
19	1,046	94	876	74	21	160	35	22	1,044	0	195	451	1,690	-60	3,204
20	1,064	94	894	74	22	190	60	23	1,062	0	250	378	1,690	-60	3,144
21	1,087	94	917	74	23	160	64	24	1,085	0	224	361	1,670	-80	3,064
22	1,207	94	1,064	53	24	150	0	25	1,211	0	150	369	1,730	-20	3,044
23	1,396	94	1,245	53	25	0	0	26	1,392	0	0	248	1,640	-110	2,934
24	1,299	94	1,153	53	26	0	32	27	1,300	0	32	228	1,560	-190	2,744
25	1,125	94	976	53	27	165	11	28	1,123	0	176	311	1,610	-140	2,604
26	1,318	94	1,171	53	28	0	0	29	1,318	0	0	292	1,610	-140	2,464
27	1,409	94	1,262	53	29	0	0	30	1,409	0	0	241	1,650	-100	2,364
28	1,415	94	1,267	53	30	0	0	31	1,414	0	0	266	1,680	-70	2,294
Total	34,302	3,135	28,929	2,202		5,081	2,924		34,266	0	8,005	13,149	55,420		

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.
Col. 12 = Col. 11 - Col. 8 - 1,750 ft3/s computed algebraically, but not greater than Col. 7; except that part of Col. 8 contributing to the excess-release increment of Col. 11.
Col. 13 = Season limit of cumulative credit beginning June 15, 2000 = 13,556 (ft^3/s)-d. One half of this quantity [6,778 (ft^3/s)-d] available for release.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, N.J.—continued (River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow Delaware River at Montague, N.J.							
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallen-paupack	Rio Reservoir	Date	Controlled Releases			Computed uncon-tolled	Total	Excess Release Credits	
									N.Y.C. Reservoirs		Power-plants				
Date	Amount								Directed	Other				Daily	Cumul.
2001	Col. 1	Col. 2	Col. 3	Col. 4	2001	Col. 5	Col. 6	2001	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13
Aug. 29	1,555	94	1,408	53	Aug. 31	0	0	Sept. 1	1,555	0	0	245	1,800	50	2,344
30	1,431	94	1,282	53	Sept. 1	0	71	2	1,429	0	71	350	1,850	100	2,444
31	1,315	90	1,174	53	2	0	0	3	1,317	0	0	393	1,710	-40	2,404
Sept. 1	1,380	70	1,256	53	3	0	0	4	1,379	0	0	361	1,740	-10	2,394
2	1,031	70	908	53	4	355	43	5	1,031	0	398	381	1,810	60	2,454
3	1,064	68	941	53	5	193	0	6	1,062	0	193	525	1,780	30	2,484
4	1,304	68	1,180	53	6	476	0	7	1,301	0	476	463	2,240	490	2,974
5	1,072	70	950	53	7	450	0	8	1,073	0	450	467	1,990	240	3,214
6	1,541	70	1,419	53	8	0	0	9	1,542	0	0	358	1,900	150	3,364
7	1,481	70	1,357	53	9	0	89	10	1,480	0	89	321	1,890	140	3,504
8	1,145	70	1,024	53	10	320	46	11	1,147	0	366	387	1,900	150	3,654
9	1,156	70	1,033	53	11	354	0	12	1,156	0	354	380	1,890	140	3,794
10	1,159	70	1,035	53	12	292	0	13	1,158	0	292	310	1,760	10	3,804
11	1,052	70	930	53	13	276	57	14	1,053	0	333	474	1,860	110	3,914
12	967	70	845	53	14	426	78	15	968	0	504	538	2,010	260	4,174
13	1,321	70	1,197	53	15	0	0	16	1,320	0	0	510	1,830	80	4,254
14	1,404	70	1,275	53	16	0	0	17	1,398	0	0	352	1,750	0	4,254
15	1,161	70	1,040	53	17	259	0	18	1,163	0	259	378	1,800	50	4,304
16	1,145	70	1,023	53	18	243	0	19	1,146	0	243	441	1,760	10	4,314
17	1,139	70	1,016	53	19	271	0	20	1,139	0	271	390	1,800	50	4,364
18	1,196	70	1,074	53	20	276	82	21	1,197	0	358	815	2,370	620	4,984
19	1,169	70	1,046	53	21	248	50	22	1,169	0	298	863	2,330	580	5,564
20	811	70	688	53	22	0	50	23	811	0	50	899	1,760	10	5,574
21	838	70	716	53	23	2	0	24	839	0	2	579	1,420	-330	5,244
22	0	70	45	53	24	176	67	25	0	168	243	1,219	1,630	-120	5,124
23	0	70	45	53	25	186	96	26	0	168	282	1,720	2,170	0	5,124
24	0	70	45	53	26	2	67	27	0	168	69	2,423	2,660	0	5,124
25	0	70	45	53	27	215	82	28	0	168	297	1,515	1,980	0	5,124
26	0	70	45	53	28	211	0	29	0	168	211	1,201	1,580	-170	4,954
27	509	70	387	53	29	0	64	30	510	0	64	766	1,340	-410	4,544
Total	29,346	2,164	26,429	1,590		5,231	942		29,343	840	6,173	20,024	56,310		

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.
Col. 12 = Col. 11 - Col. 8 - 1,750 ft3/s computed algebraically, but not greater than Col. 7; except that part of Col. 8 contributing to the excess-release increment of Col. 11.
Col. 13 = Season limit of cumulative credit beginning June 15, 2000 = 13,556 (ft^3/s)-d. One half of this quantity [6,778 (ft^3/s)-d] available for release.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, N.J.—continued (River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow Delaware River at Montague, N.J.							
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallen-paupack	Rio Reservoir	Date	Controlled Releases			Computed uncon-tolled	Total	Excess Release Credits	
									N.Y.C. Reservoirs		Power-plants				
Date	Amount								Directed	Other				Daily	Cumul.
2001	Col. 1	Col. 2	Col. 3	Col. 4	2001	Col. 5	Col. 6	2001	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13
Sept. 28	835	70	715	53	Sept. 30	0	0	Oct. 1	838	0	0	782	1,620	-130	4,414
29	832	70	719	45	Oct. 1	106	0	2	834	0	106	730	1,670	-80	4,334
30	995	65	903	25	2	130	103	3	993	0	233	594	1,820	70	4,404
Oct. 1	964	45	894	25	3	135	82	4	964	0	217	589	1,770	20	4,424
2	1,047	45	976	25	4	126	64	5	1,046	0	190	524	1,760	10	4,434
3	1,176	45	1,101	25	5	113	0	6	1,171	0	113	626	1,910	160	4,594
4	1,266	45	1,199	25	6	0	0	7	1,269	0	0	451	1,720	-30	4,564
5	1,272	45	1,200	25	7	34	0	8	1,270	0	34	376	1,680	-70	4,494
6	1,253	45	1,182	25	8	80	103	9	1,252	0	183	395	1,830	80	4,574
7	1,316	45	1,248	25	9	0	0	10	1,318	0	0	382	1,700	-50	4,524
8	1,425	45	1,352	25	10	0	0	11	1,422	0	0	368	1,790	40	4,564
9	1,455	45	1,385	25	11	0	0	12	1,455	0	0	365	1,820	70	4,634
10	1,421	45	1,352	25	12	0	89	13	1,422	0	89	379	1,890	140	4,774
11	1,405	45	1,337	25	13	0	0	14	1,407	0	0	353	1,760	10	4,784
12	1,268	45	1,197	25	14	0	0	15	1,267	0	0	473	1,740	-10	4,774
13	1,398	45	1,327	25	15	0	0	16	1,397	0	0	453	1,850	100	4,874
14	1,360	45	1,289	25	16	0	0	17	1,359	0	0	511	1,870	120	4,994
15	1,427	45	1,357	25	17	0	0	18	1,427	0	0	453	1,880	130	5,124
16	1,312	45	1,242	25	18	0	0	19	1,312	0	0	468	1,780	30	5,154
17	1,292	45	1,222	25	19	0	0	20	1,292	0	0	468	1,760	10	5,164
18	1,314	45	1,242	25	20	0	0	21	1,312	0	0	418	1,730	-20	5,144
19	1,374	45	1,306	25	21	0	0	22	1,376	0	0	364	1,740	-10	5,134
20	1,388	45	1,318	25	22	0	0	23	1,388	0	0	362	1,750	0	5,134
21	1,394	45	1,323	25	23	0	0	24	1,393	0	0	337	1,730	-20	5,114
22	1,319	45	1,248	25	24	0	0	25	1,318	0	0	522	1,840	90	5,204
23	1,431	45	1,361	25	25	0	0	26	1,431	0	0	499	1,930	180	5,384
24	1,351	45	1,279	25	26	0	50	27	1,349	0	50	431	1,830	80	5,464
25	1,252	45	1,182	25	27	0	67	28	1,252	0	67	431	1,750	0	5,464
26	1,366	45	1,295	26	28	0	0	29	1,366	0	0	444	1,810	60	5,524
27	1,383	46	1,310	25	29	0	0	30	1,381	0	0	409	1,790	40	5,564
28	1,407	45	1,335	25	30	0	0	31	1,405	0	0	385	1,790	40	5,604
Total	39,698	1,466	37,396	824		724	558		39,686	0	1,282	14,342	55,310		

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.
Col. 12 = Col. 11 - Col. 8 - 1,750 ft3/s computed algebraically, but not greater than Col. 7; except that part of Col. 8 contributing to the excess-release increment of Col. 11.
Col. 13 = Season limit of cumulative credit beginning June 15, 2000 = 13,556 (ft^3/s)-d. One half of this quantity [6,778 (ft^3/s)-d] available for release.

Table 9. Controlled releases from reservoirs in the upper Delaware River Basin and segregation of flow of Delaware River at Montague, N.J.—continued (River Master daily operation record)

[Mean discharge in cubic feet per second for 24 hours; Col., Column]

Controlled Releases from New York City Reservoirs					Controlled Releases from Power Reservoirs			Segregation of Flow Delaware River at Montague, N.J.							
Directed		Pepacton	Cannonsville	Neversink	Date	Lake Wallen-paupack	Rio Reservoir	Date	Controlled Releases			Computed uncon-tolled	Total	Excess Release Credits	
									N.Y.C. Reservoirs		Power-plants				
Date	Amount								Directed	Other				Daily	Cumul.
2001	Col. 1	Col. 2	Col. 3	Col. 4	2001	Col. 5	Col. 6	2001	Col. 7	Col. 8	Col. 9	Col. 10	Col. 11	Col. 12	Col. 13
Oct. 29	1,267	359	885	25	Oct. 31	0	0	Nov. 1	1,269	0	0	381	1,650		
30	1,240	360	854	25	Nov. 1	0	32	2	1,239	0	32	439	1,710		
31	1,246	359	859	25	2	0	67	3	1,243	0	67	450	1,760		
Nov. 1	1,207	357	821	25	3	0	0	4	1,203	0	0	477	1,680		
2	1,113	357	727	25	4	114	0	5	1,109	0	114	417	1,640		
3	1,150	357	760	25	5	59	0	6	1,142	0	59	589	1,790		
4	1,144	356	761	25	6	0	0	7	1,142	0	0	488	1,630		
5	1,111	538	548	25	7	0	0	8	1,111	0	0	509	1,620		
6	1,011	551	438	25	8	0	0	9	1,014	0	0	526	1,540		
7	1,103	549	529	25	9	0	103	10	1,103	0	103	434	1,640		
8	1,077	541	511	25	10	0	0	11	1,077	0	0	483	1,560		
9	1,067	644	399	25	11	0	0	12	1,068	0	0	452	1,520		
10	1,061	645	391	25	12	0	0	13	1,061	0	0	479	1,540		
11	1,053	644	387	25	13	0	0	14	1,056	0	0	434	1,490		
12	1,055	642	388	25	14	0	82	15	1,055	0	82	403	1,540		
13	1,087	640	421	25	15	0	0	16	1,086	0	0	424	1,510		
14	1,099	637	436	25	16	0	67	17	1,098	0	67	405	1,570		
15	1,096	634	436	25	17	7	0	18	1,095	0	7	408	1,510		
16	1,109	633	453	25	18	0	0	19	1,111	0	0	389	1,500		
17	1,075	630	422	25	19	0	0	20	1,077	0	0	393	1,470		
18	1,081	628	429	25	20	0	0	21	1,082	0	0	408	1,490		
19	1,094	627	441	25	21	0	0	22	1,093	0	0	407	1,500		
20	1,139	625	489	23	22	0	0	23	1,137	0	0	383	1,520		
21	1,140	623	492	25	23	0	0	24	1,140	0	0	370	1,510		
22	1,149	622	504	26	24	0	0	25	1,152	0	0	418	1,570		
23	1,008	620	365	25	25	0	0	26	1,010	0	0	570	1,580		
24	886	619	243	25	26	0	0	27	887	0	0	883	1,770		
25	728	599	104	25	27	0	0	28	728	0	0	972	1,700		
26	496	427	45	25	28	0	0	29	497	0	0	943	1,440		
27	576	506	45	25	29	0	57	30	576	0	57	827	1,460		
Total	31,668	16,329	14,583	749		180	408		31,661	0	588	15,161	47,410		

Col. 2 - 24 hours beginning 1200 of date shown.
Col. 3 - 24 hours ending 2400 one day later.
Col. 4 - 24 hours beginning 1500 one day later.
Col. 5 - 24 hours beginning 0800 of date shown.
Col. 6 - 24 hours beginning 1600 of date shown.

Col. 7 = Col. 2 + Col. 3 + Col. 4 in response to direction (Col. 1).
Col. 8 = Col. 2 + Col. 3 + Col. 4 - Col. 7.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.

Col. 12 = Col. 11 - Col. 8 - 1,750 ft3/s computed algebraically, but not greater than Col. 7; except that part of Col. 8 contributing to the excess-release increment of Col. 11.
Col. 13 = Season limit of cumulative credit beginning June 15, 2000 = 13,556 (ft^3/s)-d. One half of this quantity [6,778 (ft^3/s)-d] available for release.

Table 10. Diversions to New York City water supply
Million gallons per day for 24 hour period beginning 0800 local time
(River Master daily operation record)

Date 2000	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2000 to date	Date 2001	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2000 to date
Dec. 1	448	0	0	598	Jan. 1	447	0	0	578
2	448	0	0	597	2	447	0	0	577
3	448	0	0	596	3	447	0	0	577
4	448	0	0	595	4	448	270	0	577
5	448	0	0	594	5	448	299	0	578
6	448	0	0	594	6	448	299	0	579
7	447	0	0	593	7	448	299	0	579
8	448	0	15	592	8	448	299	0	580
9	448	0	0	591	9	448	299	0	581
10	447	0	0	591	10	448	299	0	582
11	448	0	0	590	11	449	299	0	582
12	448	0	0	589	12	448	433	0	584
13	447	0	0	588	13	448	466	0	585
14	447	0	74	588	14	448	466	0	587
15	447	0	0	587	15	448	466	0	588
16	448	0	207	588	16	448	489	0	590
17	263	0	272	588	17	448	492	0	591
18	12	0	161	585	18	448	492	0	593
19	409	0	161	585	19	448	492	0	594
20	449	0	133	585	20	448	492	0	596
21	447	0	14	585	21	448	492	0	597
22	447	0	0	584	22	447	492	0	599
23	447	0	0	583	23	447	492	0	600
24	447	0	0	583	24	382	492	0	601
25	447	0	0	582	25	380	492	0	602
26	447	0	0	581	26	449	491	0	604
27	448	0	0	581	27	449	491	0	605
28	447	0	0	580	28	449	491	0	606
29	447	0	0	580	29	449	491	104	608
30	448	0	0	579	30	449	491	98	610
31	448	0	0	578	31	447	492	94	612
Total	13,216	0	1,037			13,754	12,058	296	

Table 10. Diversions to New York City water supply—continued
Million gallons per day for 24 hour period beginning 0800 local time
(River Master daily operation record)

Date 2001	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2000 to date	Date 2001	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2000 to date
Feb. 1	447	492	92	613	Mar. 1	448	300	0	634
2	447	491	95	615	2	448	300	0	634
3	446	491	95	617	3	447	300	0	635
4	446	491	97	618	4	447	300	0	635
5	448	491	97	620	5	393	300	0	635
6	448	491	104	622	6	391	300	0	635
7	448	491	84	623	7	390	300	137	636
8	448	320	94	624	8	389	300	289	637
9	448	300	0	625	9	394	300	48	638
10	448	300	0	625	10	390	300	49	638
11	448	300	0	626	11	391	300	46	638
12	448	300	0	626	12	391	300	38	639
13	448	300	0	627	13	392	300	30	639
14	449	300	0	627	14	391	300	24	639
15	448	301	0	628	15	390	300	25	640
16	448	301	0	628	16	387	300	0	640
17	448	301	0	629	17	296	301	0	640
18	448	301	0	629	18	290	301	0	639
19	448	300	0	630	19	301	461	0	640
20	447	300	0	630	20	302	496	0	640
21	446	300	0	630	21	300	318	0	640
22	447	300	0	631	22	294	299	0	640
23	448	300	0	631	23	198	299	0	640
24	447	300	0	632	24	195	299	0	639
25	447	300	0	632	25	195	299	0	639
26	449	301	0	633	26	196	25	0	637
27	448	300	0	633	27	198	0	0	636
28	448	300	0	633	28	3	0	0	634
					29	0	0	0	632
					30	0	0	0	630
					31	0	0	0	627
Total	13,216	0	1,037			13,754	12,058	296	

Table 10. Diversions to New York City water supply—continued
Million gallons per day for 24 hour period beginning 0800 local time
(River Master daily operation record)

Date 2001	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2000 to date	Date 2001	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2000 to date
Apr. 1	0	200	0	626	May 1	596	0	165	608
2	0	279	96	625	2	595	260	174	610
3	0	300	93	625	3	465	299	182	611
4	0	300	86	624	4	447	82	157	611
5	0	300	107	623	5	446	0	150	611
6	0	300	114	622	6	446	0	150	611
7	0	300	109	622	7	447	0	71	611
8	0	300	110	621	8	448	0	179	611
9	0	301	104	620	9	447	0	186	611
10	0	6	0	618	10	449	236	216	612
11	0	0	0	616	11	450	299	218	613
12	0	0	0	614	12	449	299	77	613
13	0	0	0	612	13	447	299	70	614
14	0	0	0	611	14	498	299	199	615
15	0	0	0	609	15	500	299	231	616
16	0	0	0	607	16	500	299	221	617
17	0	0	0	605	17	500	300	243	618
18	315	0	0	604	18	500	299	141	619
19	558	0	132	604	19	500	300	221	620
20	577	0	0	604	20	500	299	126	621
21	540	0	0	604	21	492	299	116	622
22	541	0	228	604	22	498	299	242	623
23	596	0	115	605	23	496	298	226	624
24	597	0	89	605	24	461	212	226	625
25	597	0	107	605	25	448	200	239	626
26	596	0	176	606	26	388	200	0	626
27	596	0	130	606	27	380	84	0	625
28	595	0	218	607	28	382	109	0	625
29	595	0	232	607	29	385	202	0	625
30	595	0	183	608	30	391	78	0	624
					31	391	0	0	624
Total	7,298	2,586	2,429			14,342	5,850	4,426	

Table 10. Diversions to New York City water supply—continued
Million gallons per day for 24 hour period beginning 0800 local time
(River Master daily operation record)

Date 2001	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2001 to date	Date 2001	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2001 to date
June 1	392	0	0	392	July 1	449	0	146	447
2	0	289	0	341	2	448	0	165	453
3	17	299	0	332	3	449	0	127	456
4	320	18	0	334	4	449	0	149	460
5	275	0	0	322	5	449	0	186	465
6	188	0	0	300	6	448	0	200	471
7	0	298	0	299	7	449	0	196	475
8	0	299	0	299	8	449	0	200	480
9	0	300	0	299	9	449	0	202	484
10	18	300	0	301	10	449	0	218	489
11	303	284	0	327	11	448	0	195	493
12	289	298	217	367	12	448	199	197	501
13	305	299	190	400	13	449	201	152	508
14	302	299	256	433	14	448	201	162	515
15	280	299	212	456	15	448	201	148	521
16	0	299	118	454	16	448	200	150	527
17	0	299	0	445	17	448	200	159	533
18	0	299	386	458	18	448	201	155	539
19	0	299	391	470	19	448	289	3	543
20	0	299	393	481	20	449	299	0	547
21	0	33	390	479	21	450	298	163	554
22	0	0	390	475	22	450	298	135	560
23	0	0	196	463	23	450	298	45	565
24	0	0	195	451	24	450	299	161	571
25	0	0	186	441	25	450	299	103	576
26	0	0	198	431	26	448	298	202	583
27	0	0	198	423	27	448	234	183	588
28	393	0	223	430	28	448	200	187	592
29	450	0	198	437	29	447	200	197	596
30	450	0	144	442	30	448	201	90	599
					31	450	201	98	601
Total	3,982	4,810	4,481			13,909	4,817	4,674	

Table 10. Diversions to New York City water supply—continued
Million gallons per day for 24 hour period beginning 0800 local time
(River Master daily operation record)

Date 2001	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2001 to date	Date 2001	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2001 to date
Aug. 1	450	201	263	606	Sept. 1	448	95	145	664
2	450	200	270	611	2	448	102	135	664
3	450	193	270	616	3	448	105	0	663
4	450	201	243	620	4	448	141	165	664
5	450	201	202	624	5	448	136	151	665
6	450	201	185	627	6	447	117	186	666
7	450	201	163	630	7	499	125	204	667
8	450	201	215	633	8	499	123	206	669
9	450	201	227	637	9	499	123	210	670
10	449	201	165	639	10	499	79	207	672
11	449	201	100	641	11	499	16	199	672
12	448	201	100	642	12	498	90	204	673
13	448	200	137	644	13	460	125	199	674
14	447	200	31	645	14	299	0	45	671
15	447	200	71	645	15	497	133	196	673
16	447	202	119	647	16	497	70	207	673
17	447	202	147	649	17	498	290	215	676
18	446	202	99	650	18	498	297	236	680
19	446	201	44	651	19	498	296	230	683
20	448	201	106	652	20	498	296	237	686
21	449	201	103	653	21	498	297	200	689
22	448	201	102	654	22	497	296	206	691
23	448	200	115	656	23	497	297	196	694
24	447	201	112	657	24	497	297	200	697
25	447	202	86	658	25	498	297	205	699
26	447	201	88	659	26	497	298	207	702
27	447	200	98	660	27	497	297	202	704
28	447	201	0	660	28	497	297	0	705
29	448	200	117	661	29	497	210	0	705
30	448	200	179	663	30	497	209	0	705
31	449	125	193	664					
Total	13,897	6,143	4,350			14,397	5,554	4,993	

Table 10. Diversions to New York City water supply—continued
Million gallons per day for 24 hour period beginning 0800 local time
(River Master daily operation record)

Date 2001	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 2001 or Oct. 29, 2001 to date	Date 2001	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average Oct. 29, 2001 or Nov. 4, 2001 to date
Oct. 1	496	209	0	705	Nov. 1	496	0	218	668
2	300	129	1	703	2	496	0	201	673
3	498	215	178	704	3	496	0	221	681
4	499	214	183	706	4	496	0	0	496
5	498	213	209	707	5	497	0	0	497
6	498	1	258	708	6	496	0	0	496
7	497	0	259	708	7	497	0	0	497
8	496	0	261	709	8	497	0	0	497
9	498	0	262	709	9	496	0	0	497
10	498	0	258	709	10	495	0	0	496
11	498	0	263	710	11	495	0	0	496
12	498	0	239	710	12	494	0	0	496
13	392	0	1	708	13	497	0	0	496
14	390	0	1	705	14	496	0	0	496
15	395	0	0	703	15	497	0	0	496
16	347	0	0	700	16	496	0	0	496
17	395	0	0	698	17	495	0	149	507
18	514	0	274	699	18	495	0	147	516
19	477	0	330	700	19	494	0	135	523
20	448	0	1	698	20	494	0	144	530
21	448	0	0	696	21	468	0	128	533
22	507	99	336	698	22	495	0	161	540
23	514	102	343	700	23	494	0	148	545
24	514	101	342	701	24	494	0	105	547
25	517	101	345	703	25	493	0	104	550
26	517	0	344	704	26	498	0	103	552
27	538	0	357	706	27	490	0	98	553
28	516	0	344	707	28	496	0	98	555
29	498	0	31	529	29	495	0	95	556
30	497	0	218	622	30	499	0	97	558
31	497	0	215	652					
Total	14, 695	1,384	5,853			14,837	0	2,352	

Table 11. Daily mean discharge, East Branch Delaware River at Downsville, N.Y. (station number 01417000), for year ending November 30, 2001 (U.S. Geological Survey published record)

[All values except total in cubic feet per second, ft^3/s; total in cubic feet per second days, (ft^3/s)-d]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	47	47	49	46	47	56	79	103	99	69	52	350
2	47	47	48	46	47	61	86	93	116	61	47	349
3	47	47	48	46	47	61	87	87	105	61	47	348
4	47	47	48	46	46	61	87	87	85	62	47	347
5	47	48	48	46	46	61	87	87	85	63	47	431
6	47	48	46	46	46	61	86	87	100	64	47	543
7	47	47	46	46	46	61	86	87	115	63	47	543
8	47	48	46	46	46	61	85	87	115	63	47	541
9	47	48	46	46	47	62	86	87	115	63	47	587
10	46	48	47	46	47	62	87	87	115	63	47	646
11	47	48	46	46	47	62	87	87	100	63	47	643
12	47	48	46	46	47	63	86	87	85	63	47	643
13	46	48	46	47	48	63	85	87	85	63	47	643
14	46	47	46	47	48	63	85	86	85	63	47	642
15	46	47	46	46	857	68	86	85	85	63	47	640
16	46	47	46	46	2160	73	93	85	85	63	47	633
17	48	47	46	46	2240	73	95	85	85	63	47	632
18	47	47	46	46	1870	73	87	85	85	63	47	631
19	48	47	46	46	1230	73	97	85	85	63	47	631
20	48	47	46	46	711	75	85	85	85	63	47	631
21	48	48	46	47	469	75	85	85	85	63	47	631
22	48	47	46	47	394	75	85	85	85	63	47	629
23	47	47	46	47	390	75	85	95	85	63	47	623
24	47	47	46	47	295	76	85	114	84	64	47	620
25	47	47	46	46	190	75	86	114	83	64	47	620
26	47	47	46	46	88	76	86	100	82	64	46	488
27	47	47	46	46	49	76	86	85	84	64	46	472
28	47	47	46	46	46	76	95	85	85	64	46	458
29	47	47	---	46	45	76	101	85	85	63	194	448
30	47	48	---	48	46	76	102	85	84	63	352	396
31	47	48	---	47	---	71	---	85	84	---	351	---
Total	1457	1468	1300	1435	11735	2120	2638	2767	2841	1897	2215	16439
Mean	47.0	47.4	46.4	46.3	391	68.4	87.9	89.3	91.6	63.2	71.5	548

Year total 48,312 (ft^3/s)-d

Mean 132 ft^3/s

Table 12. Daily mean discharge, West Branch Delaware River at Stilesville, N.Y. (station number 01425000), for year ending November 30, 2001 (U.S. Geological Survey published record)

[All values except total in cubic feet per second, ft^3/s; total in cubic feet per second days, (ft^3/s)-d]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	61	562	55	55	1760	506	161	461	719	1170	883	849
2	61	520	55	54	1520	449	165	282	597	1250	852	914
3	61	485	55	54	1260	309	163	161	990	906	941	705
4	61	444	54	54	1090	215	162	163	908	932	1060	741
5	61	325	54	55	1120	196	162	163	838	1170	1160	748
6	61	244	53	55	1330	203	162	380	806	943	1170	511
7	61	181	53	55	1770	212	163	388	703	1400	1150	408
8	62	137	53	55	2730	220	163	184	809	1360	1210	477
9	62	112	54	55	4190	227	162	248	661	1030	1310	468
10	61	90	55	55	6580	231	161	296	1050	1030	1350	365
11	62	64	53	55	7620	242	162	246	1050	1030	1320	345
12	63	54	53	56	6750	112	162	166	855	926	1310	345
13	63	53	54	57	6340	113	253	453	790	834	1180	343
14	61	53	56	57	5770	192	330	589	834	1170	1290	376
15	60	54	57	57	4660	357	435	318	836	1280	1260	392
16	60	53	56	58	3690	375	435	300	825	1030	1330	392
17	78	54	55	66	2880	462	350	373	1140	1010	1220	408
18	301	51	54	92	2330	541	321	408	994	1010	1200	380
19	1580	51	53	114	1920	546	396	417	710	1060	1220	386
20	2150	51	53	103	1610	588	368	874	867	1030	1280	398
21	2080	51	54	89	1390	177	242	890	893	732	1300	450
22	1850	51	53	217	1250	80	161	464	922	670	1310	448
23	1550	51	53	394	1130	58	162	491	1070	98	1240	463
24	1310	51	54	505	1030	55	161	480	1260	56	1340	335
25	1130	52	56	536	934	54	215	599	1170	59	1260	251
26	947	54	56	543	845	52	339	634	979	52	1170	146
27	835	53	56	629	764	52	466	1120	1170	52	1280	63
28	774	50	56	689	685	52	585	1110	1270	305	1250	51
29	693	56	---	705	610	64	518	801	1270	670	1330	55
30	639	55	---	1070	549	154	444	837	1410	678	886	56
31	601	53	---	1720	---	160	---	850	1280	---	841	---
Total	17499	4215	1523	8359	76107	7254	8129	15146	29676	24943	36903	12269
Mean	564	136	54.4	270	2537	234	271	489	957	831	1190	409

Year total 242,023 (ft^3/s)-d

Mean 663 ft^3/s

Table 13. Daily mean discharge, Neversink River at Neversink, N.Y. (station number 01436000), for year ending November 30, 2001

[All values except total in cubic feet per second, ft^3/s; total in cubic feet per second days, (ft^3/s)-d]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	24	25	23	24	24	47	54	92	79	46	34	30
2	24	25	23	24	24	59	54	69	91	46	28	30
3	25	25	23	24	24	58	54	49	91	46	28	29
4	25	24	24	24	24	58	54	49	92	46	28	30
5	24	24	23	24	24	58	54	49	92	45	28	29
6	24	24	23	24	24	58	51	50	90	45	28	29
7	25	24	23	24	24	61	49	51	91	45	28	29
8	25	24	23	24	25	57	49	51	92	45	28	30
9	25	24	23	24	459	55	49	61	92	45	28	29
10	26	24	23	24	2200	54	49	69	82	45	28	30
11	26	24	23	24	1730	54	49	49	64	44	28	29
12	24	24	23	24	1520	55	49	49	48	45	28	29
13	25	24	23	24	1950	55	54	49	49	45	28	30
14	25	24	24	24	1740	55	74	49	49	44	28	29
15	24	24	23	24	1180	54	99	49	49	44	28	29
16	25	24	24	24	903	54	100	49	56	45	29	29
17	27	24	23	24	693	54	69	49	67	45	28	29
18	25	24	23	24	549	54	49	49	67	46	28	29
19	25	24	23	24	435	53	68	61	66	46	32	29
20	24	24	24	24	272	53	62	76	66	47	31	28
21	25	23	23	24	300	52	49	85	66	47	32	28
22	25	24	24	24	385	52	49	85	66	46	31	27
23	24	24	23	24	349	53	49	85	59	46	31	26
24	24	24	23	24	366	54	49	85	48	47	32	23
25	24	23	24	24	269	54	49	85	48	49	31	23
26	24	24	23	24	150	54	49	72	47	49	30	23
27	24	23	24	24	81	54	62	50	46	49	30	23
28	24	23	23	23	61	54	84	51	46	49	30	22
29	24	24	---	24	26	53	90	51	46	49	30	23
30	24	24	---	25	25	53	92	51	46	49	29	22
31	25	23	---	24	---	53	---	59	46	---	30	---
Total	764	742	651	744	15836	1692	1812	1878	2037	1385	910	825
Mean	24.6	23.9	23.2	24.0	528	54.6	60.4	60.6	65.7	46.2	29.4	27.5

Year total 29,276 (ft^3/s)-d

Mean 80.2 ft^3/s

Table 14. Daily mean discharge, Wallenpaupack Creek at Wilsonville, Pa. (station number 01432000), for year ending November 30, 2001 (Record furnished by PPL Corporation)

[All values except total in cubic feet per second, ft^3/s; total in cubic feet per second days, (ft^3/s)-d]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	0	0	209	277	0	351	0	0	324	0	106	0
2	0	161	325	341	594	368	0	445	377	0	130	0
3	0	209	0	213	680	360	0	462	372	0	135	0
4	0	185	0	184	721	447	0	0	0	302	126	0
5	0	178	161	541	710	0	0	351	0	199	113	173
6	46	0	161	584	743	0	0	594	354	520	0	0
7	184	0	220	471	666	0	0	0	391	450	0	0
8	0	209	217	494	630	0	0	0	400	0	113	0
9	0	178	162	656	737	0	0	433	367	0	0	0
10	0	119	224	223	894	0	0	411	351	320	0	0
11	0	180	213	126	1490	0	498	467	0	354	0	0
12	230	341	353	573	1720	0	423	432	0	240	0	0
13	173	0	297	487	1720	0	391	427	90	321	0	0
14	193	0	319	549	0	0	432	56	178	426	0	0
15	181	154	344	555	0	0	508	56	179	0	0	0
16	0	177	338	545	1040	0	331	450	224	0	0	0
17	221	180	182	0	939	0	449	483	208	259	0	0
18	162	189	205	0	802	0	419	474	0	243	0	0
19	118	180	231	539	957	0	396	440	0	271	0	0
20	185	0	297	543	1030	0	484	395	138	276	0	0
21	181	0	304	545	0	0	402	0	160	248	0	0
22	188	177	367	604	0	0	530	109	190	0	0	0
23	158	203	324	512	713	0	408	458	160	0	0	0
24	190	192	160	0	692	0	358	469	150	177	0	0
25	169	220	130	0	646	0	331	388	0	186	0	0
26	178	224	331	708	587	0	502	370	0	2.0	0	0
27	166	0	335	583	567	0	487	432	165	215	0	0
28	240	0	331	676	0	0	426	0	0	211	0	0
29	156	199	---	723	0	0	409	0	0	0	0	0
30	0	180	---	718	429	0	321	354	0	0	0	0
31	0	186	---	0	---	0	---	303	0	---	0	---
Total	3319	4221	6740	12970	19707	1526	8505	9259	4778	5220	723	173
Mean	107	136	241	418	657	49.2	284	299	154	174	23.3	5.8

Year total 77,141 (ft^3/s)-d

Mean 211 ft^3/s

Table 15. Daily mean discharge, Delaware River at Montague, N.J. (station number 01438500), for year ending November 30, 2001 (U.S. Geological Survey published record)

[All values except total in cubic feet per second, ft^3/s; total in cubic feet per second days, (ft^3/s)-d; e, estimated]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	2900	4690	e2900	3810	19300	3700	2880	2280	1830	1950	1620	1690
2	2740	e4200	e3400	3680	15300	3490	3630	2030	1900	2000	1650	1750
3	2440	e3900	e3500	3480	13600	3430	6650	2650	1850	1850	1820	1790
4	2080	e3600	e2800	3350	13100	3300	7490	2330	1840	1790	1760	1690
5	1960	e3800	e2700	3390	13800	3020	6220	1590	1960	1860	1760	1640
6	2130	e3800	e2900	3520	15400	2330	5020	1900	1700	1820	1930	1790
7	e2100	e3300	e2800	3580	16300	2290	4310	2080	2040	2270	1730	1630
8	e2100	e3100	e2800	3580	19500	2300	3760	1680	2220	2010	1700	1620
9	e1900	e3100	e2700	3600	22400	2240	3250	1750	2410	1910	1860	1530
10	e1800	e3100	e2800	3440	34700	2060	2900	2280	2470	1890	1730	1630
11	1990	e2700	4150	2920	35800	1910	2630	2150	1970	1890	1820	1550
12	2180	e2500	e4700	2730	29400	1920	3240	2220	1850	1880	1800	1520
13	2170	e2600	e4000	3510	26000	1840	3190	2000	1830	1760	1870	1530
14	e2100	e2300	e3800	4540	23000	1680	2920	1830	1680	1850	1740	1490
15	2330	e2300	e4100	4740	18500	1520	2760	1530	1640	2020	1730	1530
16	2230	e2200	5110	4680	15700	1500	2800	1730	1650	1840	1850	1510
17	11600	e2300	5030	4880	14600	1630	4550	1890	1720	1760	1870	1560
18	46300	e2300	4570	4990	12700	1710	6310	1830	1870	1830	1880	1510
19	21400	e2400	4210	5390	11200	1870	4770	1840	1820	1790	1770	1500
20	14900	e2300	3930	5710	9730	1940	3760	1760	1640	1820	1740	1480
21	11800	e2100	4220	6610	8030	1890	3730	1830	1590	2420	1710	1500
22	10300	e2200	4210	10700	7210	2090	3290	1690	1770	2380	1720	1510
23	8830	e2100	e3700	16100	7010	2600	3180	1800	1780	1770	1750	1530
24	7770	e2400	3580	15200	6920	3090	3060	1970	1780	1450	1750	1520
25	6940	e2200	3640	12800	6090	2880	2860	1950	1840	1670	1860	1580
26	6080	e2400	4110	11100	5510	2590	2750	2000	1770	2220	1980	1590
27	5390	e2200	4510	9790	4990	3450	2690	2000	1700	2740	1890	1780
28	5290	e1900	4320	8680	4340	4740	2560	2080	1750	2000	1830	1720
29	5440	e1800	---	8210	3500	4880	2650	1890	1750	1580	1840	1450
30	4370	e2100	---	12100	3480	3980	2480	1750	1790	1340	1820	1470
31	4020	e2200	---	25700	---	3220	---	1840	1820	---	1830	---
Total	205580	84090	105190	216510	437110	81090	112290	60150	57230	57360	55610	47590
Mean	6632	2713	3757	6984	14570	2616	3743	1940	1846	1912	1794	1586

Year total 1,519,800 (ft^3/s)-d

Mean 4,164 ft^3/s

Table 16. Diversions by New Jersey; daily mean discharge, Delaware and Raritan Canal at Port Mercer, N.J. (station number 01460440), for year ending November 30, 2001
(U.S. Geological Survey published record)

[All data except total in million gallons per day, Mgal/d; total in Million gallons, Mgal; e, estimated]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	85	98	76	79	72	85	92	100	105	96	103	95
2	87	98	76	79	77	82	59	101	105	99	101	93
3	87	100	78	81	78	79	87	100	107	100	100	97
4	86	97	78	82	80	79	91	107	112	101	101	99
5	e84	97	79	85	79	81	92	103	114	99	98	94
6	e85	98	70	78	78	83	93	103	110	98	97	80
7	e86	97	72	79	76	85	93	102	109	97	99	68
8	87	96	76	76	78	84	92	101	106	99	101	69
9	87	94	77	77	78	85	92	106	104	98	102	72
10	87	90	76	78	69	85	92	101	105	98	102	67
11	87	90	77	78	76	84	91	101	96	98	103	69
12	85	90	78	81	69	83	92	101	99	98	101	e56
13	88	91	76	59	75	85	89	101	100	100	102	e52
14	89	92	78	72	77	83	85	101	101	100	101	e52
15	89	94	81	80	78	86	86	100	104	101	97	e54
16	87	89	81	76	78	86	94	91	101	101	95	e54
17	40	86	76	74	78	86	62	103	100	101	96	e54
18	62	87	77	74	79	87	96	104	101	101	73	e54
19	84	74	76	79	79	91	103	101	100	102	72	e54
20	83	59	78	80	82	90	100	101	101	101	83	e54
21	83	80	79	73	83	91	101	99	100	105	99	e53
22	85	85	81	61	79	88	103	98	100	101	99	e52
23	90	85	79	72	78	89	102	90	98	97	98	e52
24	93	86	81	76	76	90	103	87	96	98	94	e54
25	92	88	76	78	80	90	104	98	94	98	92	e54
26	95	87	76	79	81	89	102	98	94	98	94	e57
27	95	89	78	79	79	81	102	101	95	98	95	e56
28	94	85	80	79	79	81	102	100	90	101	98	e56
29	96	84	---	81	79	89	102	101	92	102	96	e56
30	96	70	--	14	81	89	101	102	89	105	95	e55
31	98	66	--	61	--	91	---	104	92	---	94	---
Total	2672	2722	2166	2300	2331	2657	2803	3106	3120	2991	2981	1932
Mean	86.2	87.8	77.4	74.2	77.7	85.7	93.4	100	101	99.7	96.2	64.4

Year total 31,781 Mgal

Mean 87.1 Mgal/d

QUALITY OF WATER IN THE DELAWARE ESTUARY

Introduction

This section describes the water-quality monitoring program for the Delaware Estuary during the River Master 2001 report year, December 1, 2000, to November 30, 2001. This program is conducted by the U.S. Geological Survey, in cooperation with the Delaware River Basin Commission (DRBC). Selected data collected for this program are presented and water-quality conditions are summarized. The DRBC and others use these data to assess water-quality conditions and track the movement of the "salt front" in the Delaware Estuary.

Water-Quality Monitoring Program

As part of a long-term program, the quality of water in the Delaware Estuary between Trenton, N.J., and Reedy Island Jetty, Del., is monitored at various locations (fig. 6). Data on temperature, specific conductance, dissolved oxygen, and pH were collected by electronic instruments at four sites -- Trenton, Benjamin Franklin Bridge (Philadelphia), Chester, and Reedy Island Jetty. Data on temperature and specific conductance were collected in the same manner at Fort Mifflin. Water-quality monitors at Benjamin Franklin Bridge and Chester were not operated from December 2000 to March 2001. Monitors at Trenton and Reedy Island Jetty were operated continuously throughout the report year. The monitor at Fort Mifflin was operated only from November 7-30, 2001.

Water-quality data were obtained on a monthly basis in March, June, July, September, October, and November and on a semimonthly basis in April, May, and August 2001 at 19 sites between Biles Channel and Mahon River (sample sites A-T on fig. 6). These data were collected by the State of Delaware for the DRBC. At each of these sites, water samples were collected near the center of the channel and analyzed for selected physical properties and chemical constituents. These analyses consist of field measurements and laboratory determinations.

From March to November, water-quality data were obtained on a monthly basis at three additional sites in lower Delaware Bay (sites U-W on fig. 6). Water samples were analyzed for selected physical properties and chemical constituents.

Data obtained from the water-quality monitors are processed and stored in the USGS National Water Information System database. These data are published annually by the USGS in water resources data reports for New Jersey and Pennsylvania. Data for the other sampling sites are not presented in this report but are available from the DRBC and STORET, an environmental-quality database operated by the U.S. Environmental Protection Agency.

Water Quality During the 2001 Report Year

Streamflow

Streamflow has a major effect on the quality of water in the Delaware Estuary. High freshwater flows commonly result in improved water quality by limiting the upstream movement of seawater and reducing the concentration of dissolved substances. High flows also aid in maintaining lower water temperatures during warm weather and in supporting higher concentrations of dissolved oxygen. Under certain conditions, however, high streamflows can transport large quantities of nutrients to the estuary, which may result in noxious algal blooms.

Streamflow from the Delaware River Basin above Trenton, N.J., is the major source of freshwater inflow to the Delaware Estuary. During the report year, monthly mean streamflow measured at the USGS

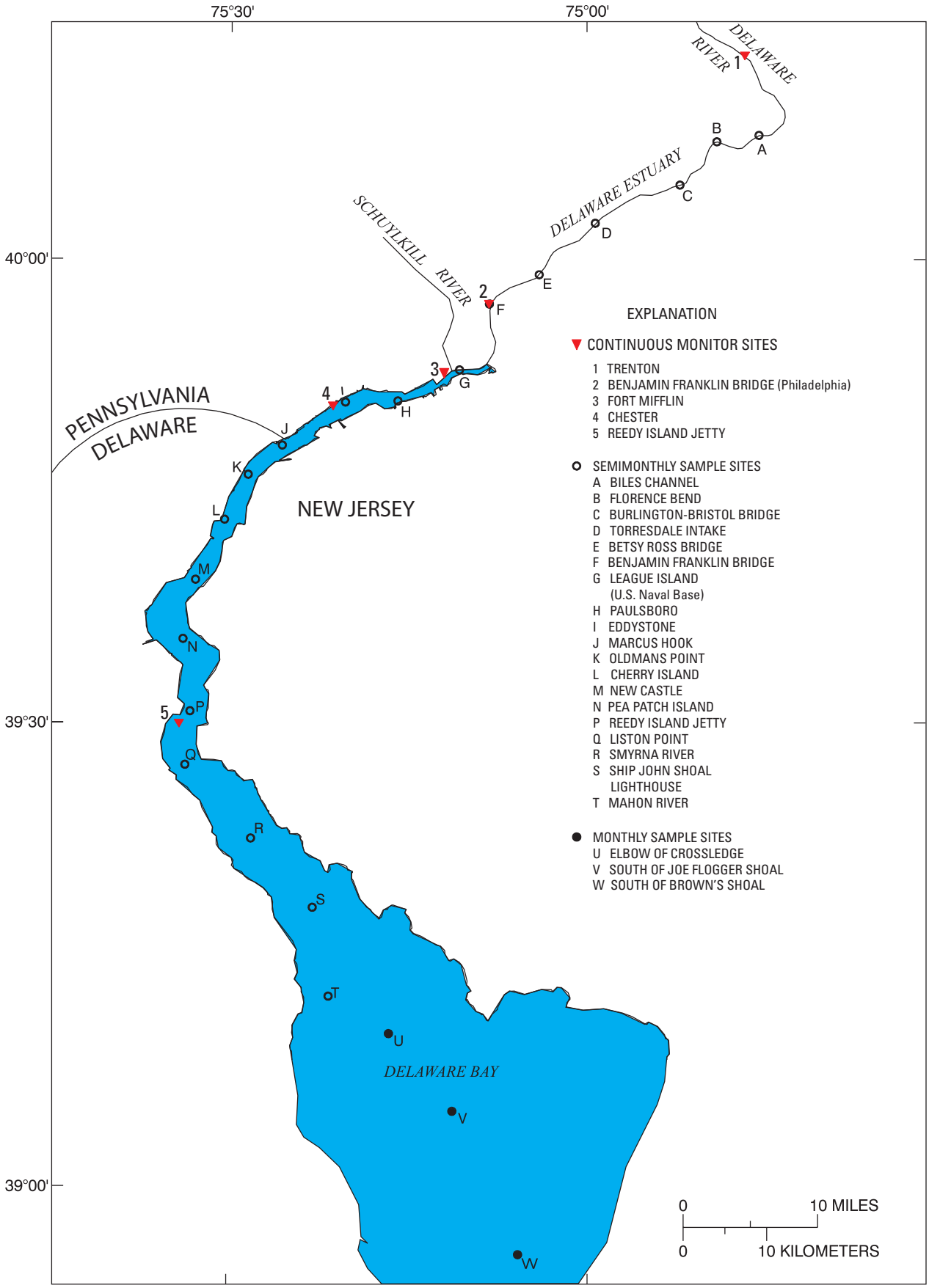

Figure 6. Location of water-quality monitoring sites on the Delaware Estuary.

gaging station Delaware River at Trenton, N.J., was highest during April 2001 (24,960 ft^3/s) and lowest during November (2,849 ft^3/s; table 17). Monthly mean streamflows were greater than long-term mean monthly flows in December, April, and June, and were less than the long-term flows in the other months. The greatest flow deficiency was in November 2001, when monthly mean streamflow was about 27 percent of the long-term mean monthly flow. Long-term monthly mean streamflow was computed on the basis of data for the period from 1913 to 2000. The highest daily mean streamflow during the report year was 64,400 ft^3/s on December 19, 2000. The lowest daily mean streamflow was 2,520 ft^3/s on November 23, 2001.

Water Temperature

Water temperature has an important influence on water quality, because it affects various physical, chemical, and biological properties of water. Generally, increases in water temperature have detrimental effects on water quality by decreasing the saturation level of dissolved oxygen and increasing the biological activity of aquatic organisms. Although the primary factors that affect water temperature in the Delaware Estuary are climatic, various kinds of water use, especially powerplant cooling, also can have significant effects.

Water-temperature records for the monitor site at Benjamin Franklin Bridge, Philadelphia, Pa., show that monthly mean temperatures during the report year were less than the long-term mean monthly temperatures in April, June, and July, and were greater than the long-term mean monthly temperatures in May, August, September, and November. In October, the monthly mean water temperature was equal to the long-term mean water temperature. Long-term mean water temperatures were computed using data for the period from 1964 to 2000 (fig. 7). The maximum daily mean water temperature of 27.6°C was recorded on August 10, 11, and 16, 2001.

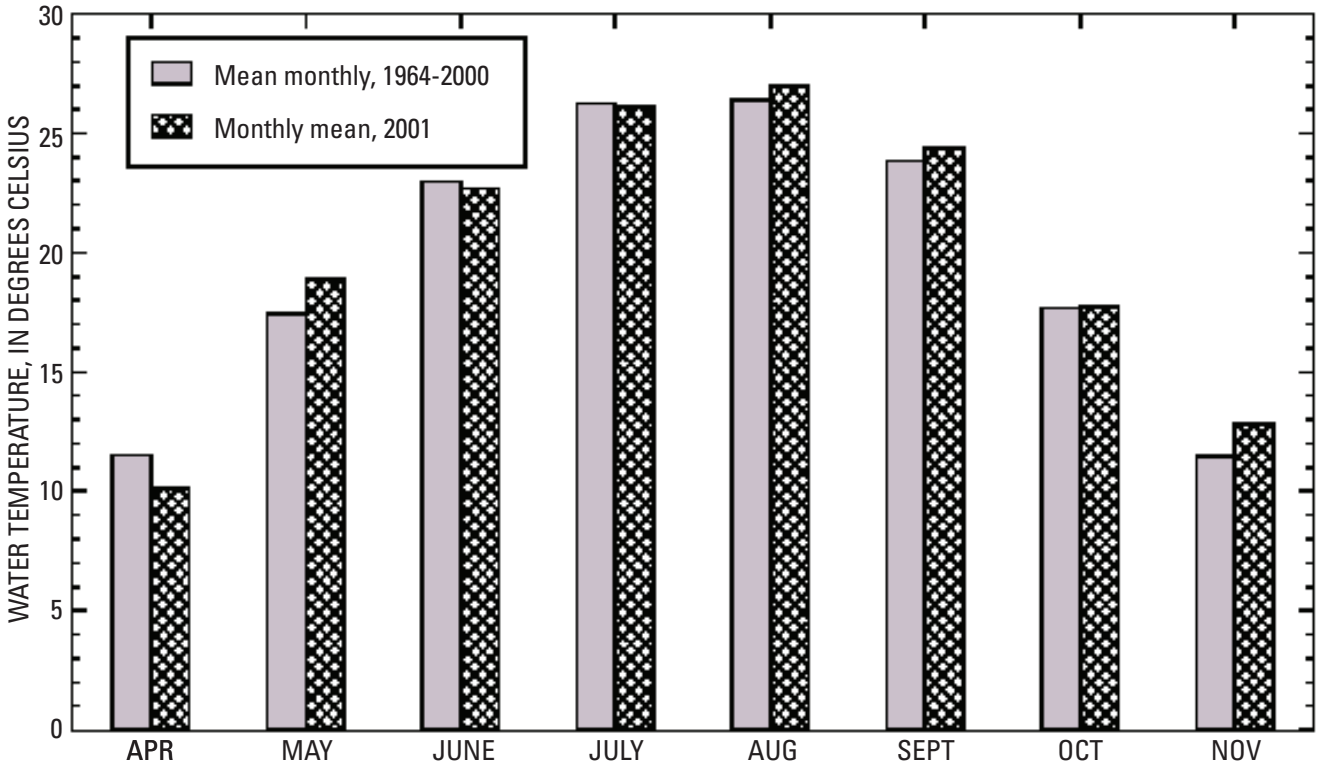

Figure 7. Water temperature in the Delaware Estuary at Benjamin Franklin Bridge at Philadelphia, Pa., April to November.

Specific Conductance and Chloride

Specific conductance is a measure of the capacity of water to conduct an electrical current and is a function of the types and quantities of dissolved substances in water. As concentrations of dissolved ions increase, specific conductance of the water increases. Specific conductance measurements are good indicators of dissolved solids content and total ion concentrations. Seawater and some man-made contaminants can cause the specific conductance of estuary water to increase substantially. Dilution associated with high streamflows results in decreased levels of dissolved solids and reduced specific conductance whereas low streamflows have the opposite effect.

The upstream movement of seawater and the accompanying increase in chloride concentrations is an important concern for water supplies obtained from the Delaware Estuary. Water with chloride concentrations greater than 250 mg/L (milligrams per liter) is considered undesirable for domestic use, and water with concentrations exceeding 50 mg/L is unsatisfactory for some industrial processes. Chloride concentrations in the estuary increase in a downstream direction, with proximity to the Atlantic Ocean.

Chloride concentration was not measured directly at the Reedy Island Jetty, Del., monitor site. Instead, a mathematical relation between specific conductance and chloride concentration has been developed on the basis of long-term field measurements of specific conductance and laboratory analyses of chloride; this relation can be used to estimate chloride concentrations from specific conductance values. Chloride concentrations estimated from the relation are presented in table 18. The specific conductance-chloride relation is less reliable when chloride concentrations are less than 30 mg/L, because other dissolved ions may be present in amounts large enough to affect the relation. Therefore, chloride concentrations estimated from specific conductance data are not presented when concentrations of less than 30 mg/L would result from the relation. Instead, estimated values less than 30 mg/L are reported as < 30 mg/L. Chloride concentrations at Chester, Pa. (table 19), were measured directly by Kimberly Clark Chester Operations and are not derived from specific conductance data.

At Fort Mifflin, the water-quality monitor was operated only on 24 days of the 2001 report year. The data set is not large enough to form the basis for meaningful descriptive statistics on chloride concentrations.

At Reedy Island Jetty, the highest daily maximum chloride concentration was 8,200 mg/L on December 7, 2000 (table 18) and October 2, 2001. Daily maximum chloride concentrations during the report year exceeded 1,000 mg/L on 96 percent of the days. The lowest daily minimum chloride concentrations for the report year were less than 30 mg/L on April 12-16, 2001. Daily minimum chloride concentrations exceeded 1,000 mg/L on 68 percent of the days. From December to April, a period of generally higher freshwater inflow, daily maximum chloride concentrations at Reedy Island Jetty ranged from 39 to 8,200 mg/L. From May to November, freshwater inflow was lower and daily maximum chloride concentrations ranged from 2,100 to 8,200 mg/L.

At Chester, the highest daily maximum chloride concentration was 800 mg/L on November 15, 2001 (table 19). During the report year, daily maximum concentrations exceeded 50 mg/L on 77 percent of the days. The lowest daily minimum chloride concentration was 27 mg/L on June 17, 2001. Daily minimum concentrations exceeded 50 mg/L on 60 percent of the days. Chloride concentrations were persistently high from August to November, when daily minimum concentrations exceeded 50 mg/L on all days of each month except 2 days in August.

Dissolved Oxygen

Dissolved oxygen in water is necessary for the respiratory processes of aquatic organisms and in chemical reactions in aquatic environments. Fish and many other clean-water species require relatively high dissolved oxygen concentrations at all times. The major source of dissolved oxygen in the Delaware Estuary is diffusion from the atmosphere, and to a lesser extent, photosynthetic activity of aquatic plants. The principal factors that affect dissolved oxygen concentrations in the Estuary are water temperature, bio-

chemical oxygen demand, freshwater inflow, phytoplankton, turbidity, salinity, and tidal and wind-driven mixing.

Concentrations of dissolved oxygen at several sites on the Delaware Estuary have been measured since 1962 by the U.S. Geological Survey. Two of these sites, Delaware River at Benjamin Franklin Bridge at Philadelphia, Pa., and Delaware River at Chester, Pa., have nearly continuous records and are in the reach of the estuary most affected by effluent discharges. The mean and minimum daily mean dissolved oxygen concentrations from July to September at these stations during the 1965-2001 report years is shown in figure 8. An increasing trend in concentration is evident. Although concentrations have increased considerably over this 37-year period, mean concentrations can vary substantially from year to year.

Concentrations of dissolved oxygen in the Delaware Estuary generally are greatest near Trenton and decrease in a downstream direction. In an area just below the Benjamin Franklin Bridge, concentrations usually reach minimum levels. During the report year, daily mean concentrations of dissolved oxygen at the Benjamin Franklin Bridge monitor site were lowest in late June and mid-August, and the lowest recorded daily mean concentration was 3.5 mg/L on August 13 and 14 (table 20). Daily mean concentrations of dissolved oxygen were consistently 6.0 mg/L or greater from April 1 to May 17, May 29 to June 14, and from October 8 to November 30, 2001. At Chester, daily mean dissolved oxygen concentrations were lowest during late-June and mid-August, and the lowest recorded daily mean concentration was 3.5 mg/L on June 26-28 (table 21).

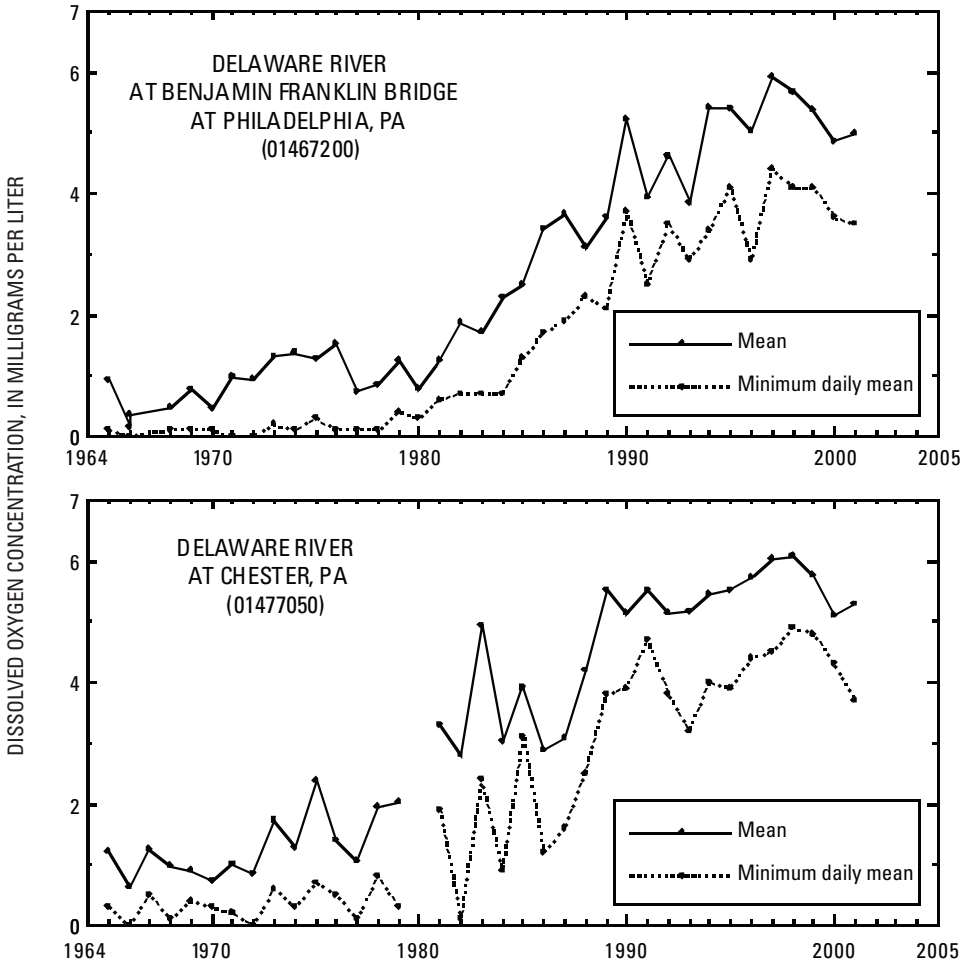

Figure 8. Mean and minimum daily mean dissolved oxygen concentrations from July to September at two monitor sites on the Delaware Estuary, 1965-2001.

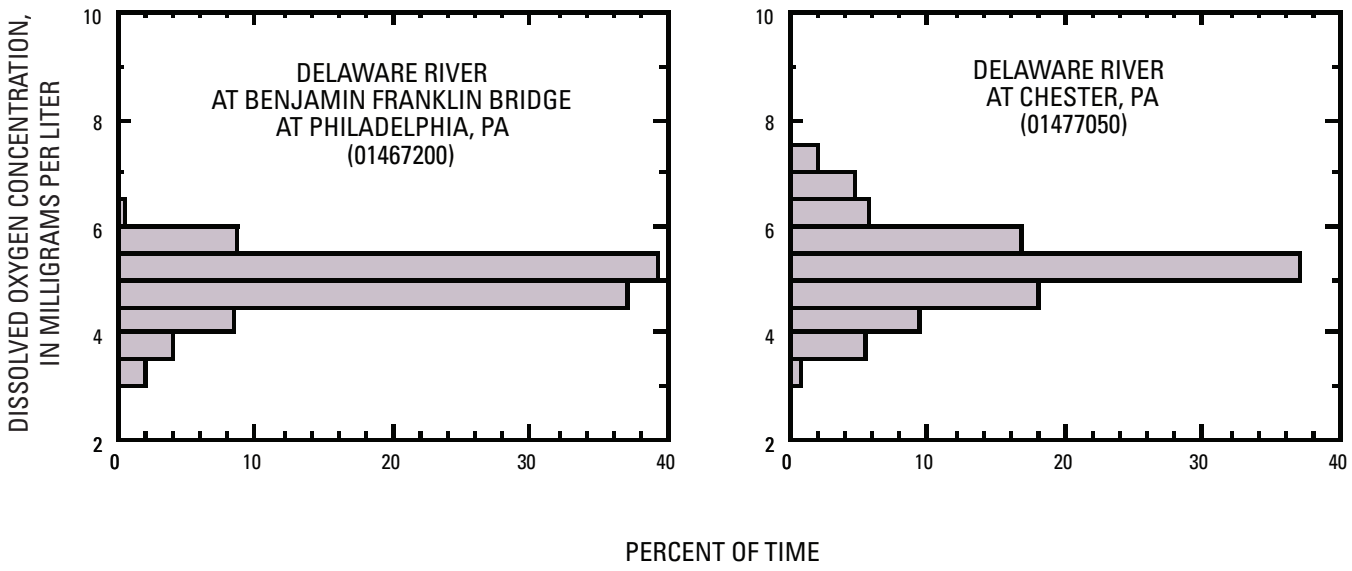

Figure 9. Distribution of hourly dissolved oxygen concentrations at two monitor sites on the Delaware Estuary, July to September 2001.

Histograms of hourly dissolved oxygen concentrations at the Benjamin Franklin Bridge and Chester monitor sites during the critical summer period – July to September 2001 – are presented in figure 9. Hourly concentrations at the Benjamin Franklin Bridge were 4 mg/L or less during 6 percent of this period. In comparison, in 2000, hourly concentrations decreased to levels of of 4 mg/L or less during 12 percent of the critical period. At Chester, hourly dissolved oxygen concentrations were 4 mg/L or less during 6 percent of the 2001 critical summer period. In 2000, hourly concentrations decreased to levels of 4 mg/L or less during 13 percent of the critical period. Dissolved oxygen concentrations of less than 4 mg/L can have adverse, and possibly lethal, effects on fish and other aquatic organisms.

Hydrogen-Ion Activity (pH)

The pH of a solution is a measure of the effective concentration (activity) of dissolved hydrogen ions. Solutions having a pH less than 7 are characterized as acidic whereas solutions with a pH greater than 7 are considered basic or alkaline. The pH of uncontaminated surface water generally ranges from 6.5 to 8.5. Major factors affecting the pH of surface water include the geologic composition of the drainage basin and human inputs including wastewater discharges. In addition, photosynthetic activity, and dissolved gases including carbon dioxide, hydrogen sulfide, and ammonia can have a considerable effect on pH. During the report year, pH was measured seasonally at the Benjamin Franklin Bridge and Chester monitor sites, and continuously at the Reedy Island Jetty site. The range of median pH for these stations is as follows: Benjamin Franklin Bridge, 6.7 to 7.5; Chester, 6.8 to 7.5; and Reedy Island Jetty, 7.0 to 8.0. Generally, the pH of water in the Delaware Estuary is lowest near Trenton, N.J. and increases (that is, becomes more alkaline) in a downstream direction.

Table 17. Daily mean discharge, Delaware River at Trenton, N.J. (station number 01463500), for year ending November 30, 2001 (U.S. Geological Survey published record)

[All values, except total, in cubic feet per second ft^3/s; total in cubic feet per second days, (ft^3/s)-d; e, estimated]

DAY	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	5650	e7900	9320	12000	43300	7760	8960	6050	3140	3030	3890	2970
2	5300	e7800	9550	11000	33700	7920	12600	7770	3120	3270	3390	3020
3	5070	e7600	9660	10400	28700	7620	12000	6040	3110	3320	3460	2870
4	4670	e7400	9060	10200	25800	7390	13800	5550	3230	3210	3400	2860
5	4190	e7500	8540	10100	24300	7060	14500	6180	4730	3110	3370	2930
6	3910	e7300	8250	9770	24600	6690	12800	5530	4350	3130	3290	2860
7	3630	7450	7940	9690	26900	6050	10800	4690	3910	3120	3330	2840
8	3500	7010	8710	10200	27300	5500	9250	4580	3310	3060	3580	2970
9	3510	6660	8010	10500	30700	5280	8130	5020	3450	3390	3100	2800
10	3490	6460	11600	10700	35000	5110	7500	4780	3630	3140	3010	2740
11	3210	6110	11500	10100	50200	4920	6730	4710	5270	2960	3090	2680
12	3340	5730	10300	9190	48300	4590	6130	4970	6420	3010	2990	2710
13	3430	5440	10300	12900	40900	4390	6570	4950	7450	3040	3070	2600
14	4230	5340	10700	15800	36400	4210	6670	4600	5730	3240	3060	2550
15	5680	5440	10500	15500	31600	3990	6110	4290	4570	3540	3190	2550
16	5510	5570	11200	15100	27300	3760	5780	4010	3980	3220	3430	2600
17	19800	5510	13000	15500	24700	3570	13500	3530	3630	3250	3510	2660
18	61600	5660	12500	16000	23800	3490	14500	4030	3340	3020	3430	2640
19	64400	6330	10700	15500	21800	3630	13500	3880	3300	2860	3430	2670
20	37900	10400	9820	15100	19100	3730	11100	3710	3380	2840	3300	2630
21	28700	9080	9850	15800	17000	3930	9120	3580	3320	4280	3150	2600
22	22500	7140	9880	21600	15300	5430	8490	3360	3080	6780	3130	2550
23	19000	5650	9700	26900	14100	8060	12600	3370	2950	5120	3050	2520
24	15900	5410	9350	30900	13600	7600	12800	3190	3220	4350	3080	2550
25	14400	5400	9110	28600	13200	7040	9940	3190	3300	4070	3100	2640
26	11600	5520	12000	24900	12100	7140	8310	4410	3200	8830	3010	3040
27	11200	5100	12800	21800	11200	13200	7350	5020	3210	6980	3030	3840
28	11300	5380	12800	19300	10300	15000	6560	4060	3120	6640	3160	3630
29	e10000	5040	---	17300	9450	13700	6100	3680	3090	5650	3120	3530
30	e10000	5360	---	25300	8290	12200	5940	3620	3100	4590	2950	3430
31	e8400	8960	---	37100	---	10400	---	3320	2980	---	2960	---
Total	415020	202650	286650	514750	748940	210360	288140	139670	117620	120050	100060	85480
Mean	13390	6537	10240	16600	24960	6786	9605	4505	3794	4002	3228	2849

Year total 3,229,390 (ft^3/s)-d

Mean 8,848 ft^3/s

Table 18. Daily maximum and minimum chloride concentrations estimated from values of specific conductance, Delaware River at Reedy Island Jetty, Del. (station number 01482800), for year ending November 30, 2001

[Concentrations in milligrams per liter; Max, maximum value; Min, minimum value; <, less than; n.d., not determined]

DAY	DEC		JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP		OCT		NOV	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	6500	3200	4700	1500	4800	2200	2900	820	1400	220	2100	860	3500	1300	2900	730	5200	2700	5300	2700	8100	4600	7200	4400
2	6800	4000	5600	1500	5000	1900	3200	820	1400	130	2800	800	3100	1200	3300	700	5000	2700	5200	2900	8200	4400	7000	4300
3	7900	3900	5500	2200	3900	1800	3300	870	870	96	2100	790	3000	1200	3500	770	5200	2300	5600	3100	7000	4300	6500	3800
4	8100	4300	5500	2500	4700	1700	3600	1000	790	100	2300	750	3000	970	3500	850	4800	2200	5500	3100	6700	4000	7200	4100
5	8100	3800	6000	2600	5400	1700	4600	1400	660	60	2600	750	3100	930	3300	900	4900	2300	5000	3000	6900	4300	6200	4000
6	7600	4400	5800	2700	4900	1500	3600	1500	280	57	2600	800	2600	860	3600	880	4800	2300	5000	3000	6500	3700	7200	4000
7	8200	4600	6300	2600	3400	1400	6000	1700	210	55	2800	960	2600	870	3400	920	4400	2300	5300	3100	6200	3600	7000	4200
8	8000	4300	6200	2700	3600	1200	6200	2300	340	77	2700	860	3000	840	3400	910	4400	2200	5000	3000	6500	3600	7700	3900
9	7900	4300	6000	2900	3800	1100	5400	2300	370	53	2500	920	2900	860	3300	910	4900	2300	5300	2800	6900	3500	7200	4200
10	8000	4700	5300	2800	3000	990	3800	1900	120	45	2600	920	3100	880	3600	1000	4900	2400	5300	2700	6800	3800	7200	4100
11	8100	4800	6000	2700	1800	710	4100	1700	82	40	2900	940	3300	950	3500	1000	4600	2200	5400	2500	6700	3500	7100	4000
12	7500	4600	5800	2700	1900	710	3400	1600	46	<30	2900	970	2900	950	3700	1000	4800	2300	6100	2700	7100	3200	7300	4300
13	6800	4000	6100	2700	2800	770	3800	1700	42	<30	2900	970	3300	960	4200	1200	4600	2300	6200	2800	6800	3500	7200	4200
14	7400	3900	5400	2700	2900	820	3900	1300	39	<30	3600	1200	3000	1100	4900	1600	5100	2000	6300	2800	6700	3800	6900	4300
15	6800	3900	5300	2900	2600	800	3300	1100	370	<30	4200	1700	3200	1300	5300	1800	5700	2200	6600	3000	6700	3900	7100	4200
16	7400	4000	5600	2800	3000	800	3200	1000	900	<30	5300	1900	3300	1300	5900	2100	5300	2500	6600	3300	6200	3900	7100	4400
17	7200	4300	5100	2900	3200	770	3000	990	1100	44	5400	2500	3600	780	6100	2100	5200	2400	6500	3500	5800	3200	7200	4300
18	5000	2100	5500	2600	2700	680	2900	710	3000	180	5300	3100	3300	700	6000	2100	4600	2100	6300	3500	5200	2900	8000	4600
19	2800	1100	5900	2600	3200	850	3400	970	4000	1100	5000	2500	3300	650	6400	2300	5000	2300	6200	3500	5900	3100	7300	4900
20	2400	620	5300	2800	3200	810	4400	1400	4000	1100	5500	2600	3300	680	6800	2600	5100	2400	6200	3700	5500	3100	6400	4400
21	2600	470	5300	2300	3500	890	5300	1900	4000	1100	5500	2800	3200	680	6500	2700	5000	2400	5500	3500	6000	3100	7800	4400
22	2700	500	5300	2200	3700	790	4900	1900	3300	1000	5300	2600	3300	780	5800	3000	4900	2400	5900	3400	5500	3200	7200	4700
23	2600	530	5500	2000	4100	1100	4100	1300	2400	850	4700	2600	3000	850	6200	3000	4800	2500	5500	3200	6600	3100	7200	4600
24	3500	560	5500	2200	2900	1000	4000	1000	3000	930	5100	2300	2100	710	5700	2900	4700	2500	5800	3200	6300	3300	7800	4800
25	2000	430	5300	2400	3400	1200	2800	890	2400	800	5100	2400	2500	630	5000	2800	5500	2700	5200	3100	5600	3400	7600	5100
26	3500	560	5700	2500	3100	1000	3000	720	3000	880	5100	2300	2600	620	4700	2500	5400	2900	5200	2900	5900	3200	7000	4700
27	3200	580	5500	2500	2900	910	2300	640	2900	940	4100	2000	2300	640	5300	2500	5000	2900	5300	2800	6000	2800	7000	4800
28	3600	660	5000	2300	2800	890	2300	550	2600	820	3600	1800	2200	660	5000	2700	5300	2600	5500	2700	7200	3100	7400	4700
29	5300	1500	5500	2500			2700	550	2100	820	3300	1600	3100	700	4800	2700	5600	2700	7000	3000	7100	4000	7700	5000
30	5300	2200	5400	2500			2400	370	2700	850	3000	1500	2800	750	5400	2800	5600	2800	7700	4600	7200	4200	7600	5100
31	4800	1600	4300	2300			2000	260			3200	1300			5300	2700	5600	2900			7200	4400		
Mean	5700	2700	5500	2500	3400	1100	3700	1200	1600	n.d	3800	1600	3000	880	4700	1800	5000	2400	5800	3100	6600	3600	7200	4400
Max	8200	4800	6300	2900	5400	2200	6200	2300	4000	1100	5500	3100	3600	1300	6800	3000	5700	2900	7700	4600	8200	4600	8000	5100
Min	2000	430	4300	1500	1800	680	2000	260	39	<30	2100	750	2100	620	2900	700	4400	2000	5000	2500	5200	2800	6200	3800

Table 19. Daily maximum and minimum chloride concentrations, Delaware River at Chester, Pa. (station number 01477050), for year ending November 30, 2001 (Record furnished by Kimberly Clark Chester Operations)

[Concentrations in milligrams per liter; --, missing data; Max, maximum value; Min, minimum value]

DAY	DEC		JAN		FEB		MAR		APR		MAY		JUN		JUL		AUG		SEP		OCT		NOV	
	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min	Max	Min
1	120	88	45	34	80	70	88	70	72	44	40	29	52	40	56	42	76	40	72	64	180	100	310	240
2	138	78	40	31	75	64	94	65	63	37	42	29	64	51	48	36	72	66	82	68	190	96	320	180
3	106	98	45	32	79	68	93	67	40	35	41	35	58	46	50	38	90	64	100	81	160	--	350	250
4	110	96	39	33	85	60	87	70	40	35	56	48	44	38	47	38	112	68	170	115	110	94	310	210
5	102	67	45	42	90	65	81	71	54	40	64	38	52	42	52	40	97	63	130	105	120	100	310	190
6	96	73	55	40	125	78	120	76	73	35	40	37	65	54	43	38	100	80	115	108	140	110	280	180
7	97	65	57	34	92	81	78	70	66	40	43	38	66	58	42	35	100	81	182	75	110	99	330	220
8	84	80	63	40	94	85	90	80	60	42	58	39	45	37	42	--	105	89	210	70	83	81	610	280
9	106	84	53	40	95	76	92	84	50	38	64	44	42	38	--	--	105	68	190	70	250	130	450	430
10	78	68	48	44	89	80	98	84	41	32	60	40	44	38	46	42	110	80	210	100	170	89	610	320
11	211	67	50	44	98	72	88	84	47	39	48	35	47	40	47	40	83	66	180	88	150	91	430	290
12	168	95	63	44	92	42	87	75	59	38	42	36	45	38	48	45	105	64	190	115	210	190	560	240
13	130	79	65	48	91	86	98	83	--	--	45	35	51	40	43	36	96	76	184	145	230	130	490	270
14	240	96	62	50	92	86	84	74	--	--	45	36	48	38	48	44	77	63	230	110	280	130	340	270
15	133	110	57	48	92	82	104	75	--	--	56	42	42	35	48	41	82	61	220	115	200	160	800	240
16	138	112	66	45	87	71	84	73	36	30	60	39	52	36	47	44	78	62	180	128	300	150	510	290
17	148	80	68	47	86	83	82	74	40	28	53	36	38	27	50	45	77	62	250	108	280	190	330	250
18	72	48	60	50	86	65	74	69	47	38	40	36	42	36	53	45	77	60	236	123	200	140	510	320
19	42	38	90	57	81	75	98	63	50	32	50	38	44	38	55	47	72	62	--	--	310	190	500	390
20	47	32	92	61	77	66	90	75	38	30	51	40	42	32	57	45	79	60	--	--	330	180	490	380
21	46	38	178	63	82	68	76	67	34	31	52	42	40	38	58	50	84	63	280	190	240	150	680	370
22	47	36	118	60	82	66	78	68	36	30	49	39	40	38	73	46	94	62	260	140	300	170	650	320
23	47	43	84	75	74	60	65	58	40	29	46	40	55	35	72	43	90	70	260	150	300	220	690	320
24	--	--	88	70	80	70	60	51	40	31	46	39	66	35	60	56	96	73	270	170	360	220	510	490
25	39	33	85	72	90	70	62	52	42	28	68	45	48	35	52	47	105	72	230	210	350	190	650	350
26	34	30	73	66	95	75	56	52	33	29	75	45	42	34	58	52	106	72	130	110	330	170	570	460
27	62	34	77	65	96	75	55	46	55	33	62	42	42	40	84	64	110	70	110	96	250	160	740	350
28	48	32	73	65	86	73	68	45	62	39	70	40	38	36	70	58	100	60	130	96	280	200	560	410
29	44	30	75	66			55	45	64	35	48	36	40	38	74	62	102	71	150	110	280	190	590	230
30	40	31	87	66			56	43	62	31	50	40	51	42	64	55	100	72	160	110	380	170	440	330
31	46	38	80	71			64	45			44	40			86	56	80	45			340	170		
Mean	94	63	70	52	88	72	81	66	50	34	52	39	48	39	56	46	92	67	183	113	239	149	497	302
Max	240	112	178	75	125	86	120	84	73	44	75	48	66	58	86	64	112	89	280	210	380	220	800	490
Min	34	30	39	31	74	42	55	43	33	28	40	29	38	27	42	35	72	40	72	64	83	81	280	180

Table 20. Daily mean dissolved oxygen concentration, Delaware River at Benjamin Franklin Bridge at Philadelphia, Pa., (station number 01467200), for year ending November 30, 2001 (U.S. Geological Survey published record)

[Concentrations in milligrams per liter; --, missing data]

DAY	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	11.2	9.2	8.4	4.3	5.1	5.3	6.0	7.2
2	10.9	9.2	8.1	4.7	5.3	5.2	6.0	7.2
3	11.1	9.2	8.0	5.0	5.5	5.3	6.1	7.1
4	11.2	9.1	8.0	5.0	5.5	5.1	6.0	7.0
5	11.2	8.9	8.2	4.8	5.5	4.9	5.7	7.0
6	11.2	8.9	8.3	4.8	5.3	5.0	5.7	7.1
7	11.1	8.9	8.5	5.0	5.1	5.0	5.8	7.1
8	11.1	8.9	8.7	5.2	5.0	5.1	6.0	7.3
9	10.8	8.7	8.5	5.1	4.9	5.1	6.1	7.5
10	10.5	8.5	8.3	5.2	4.8	5.2	6.2	--
11	10.6	8.3	7.8	5.2	4.2	5.1	6.3	--
12	10.4	8.1	7.2	5.3	3.8	5.1	6.3	--
13	10.1	7.9	6.6	5.5	3.5	5.1	6.3	--
14	10.1	7.4	6.2	5.5	3.5	5.2	6.2	7.0
15	10.2	7.0	5.9	5.5	3.6	5.1	6.2	6.9
16	10.1	6.5	5.5	5.4	3.9	5.1	6.2	6.9
17	10.0	6.1	5.5	5.3	4.3	5.1	6.5	6.9
18	10.0	5.7	5.6	5.3	4.6	5.0	6.8	6.9
19	9.9	5.2	4.8	5.2	4.6	4.9	6.8	6.9
20	9.8	5.0	4.4	5.1	4.6	4.9	6.8	7.0
21	9.7	5.0	4.1	5.0	4.6	4.8	6.6	7.1
22	9.7	4.6	3.8	5.0	4.7	4.6	6.5	7.1
23	9.7	4.4	3.6	5.0	4.7	4.6	6.5	7.2
24	9.7	4.4	3.7	5.1	4.7	4.8	6.4	7.1
25	9.6	4.8	3.7	5.2	4.4	5.0	6.3	7.3
26	9.5	4.9	3.7	5.2	4.7	4.9	6.5	7.2
27	9.5	5.0	3.7	5.1	5.2	5.0	6.8	7.2
28	9.5	5.7	3.8	5.1	5.5	5.2	7.1	7.1
29	9.5	6.6	4.0	5.1	5.7	5.5	7.2	7.1
30	9.3	7.4	4.1	5.1	5.5	6.0	7.3	7.0
31		8.0		5.1	5.4		7.3	
Mean	10.2	7.0	6.0	5.1	4.8	5.1	6.4	7.1
Max	11.2	9.2	8.7	5.5	5.7	6.0	7.3	7.5
Min	9.3	4.4	3.6	4.3	3.5	4.6	5.7	6.9

Table 21. Daily mean dissolved oxygen concentration, Delaware River at Chester, Pa. (station number 01477050), for year ending November 30, 2001
(U.S. Geological Survey published record)

[Concentrations in milligrams per liter; --, missing data]

DAY	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV
1	10.5	9.2	6.9	4.5	5.4	5.1	6.2	7.6
2	10.5	9.1	7.2	5.5	5.4	5.3	6.2	7.6
3	10.6	--	7.2	6.1	5.6	5.5	6.2	7.5
4	10.5	9.1	7.8	6.5	5.4	--	6.1	7.4
5	--	8.9	8.2	6.4	5.3	5.4	6.1	7.4
6	10.3	9.1	8.5	6.6	5.1	5.5	6.3	7.5
7	10.3	9.4	8.0	7.0	5.1	5.5	6.4	7.7
8	10.3	9.5	7.6	7.1	5.0	--	6.7	7.6
9	10.3	9.3	7.2	7.0	4.9	--	6.9	7.6
10	10.1	9.0	6.7	6.9	4.8	--	6.9	7.7
11	10.0	8.6	6.4	6.6	4.3	5.2	6.9	7.9
12	9.9	8.1	5.9	6.4	4.0	5.2	6.9	8.1
13	--	7.7	5.5	6.1	3.9	5.4	6.8	8.1
14	--	7.4	5.1	6.0	3.7	5.4	6.9	8.2
15	--	7.0	4.7	5.9	3.8	5.5	6.9	8.2
16	9.8	6.8	4.5	5.7	3.9	5.6	6.8	8.2
17	9.8	6.8	--	5.4	4.3	5.5	7.1	8.3
18	9.9	6.6	--	5.2	4.3	5.5	7.2	8.4
19	9.9	6.2	3.7	5.2	4.2	5.3	7.2	8.3
20	9.8	6.2	3.7	5.2	4.2	5.4	7.2	8.4
21	9.7	6.5	3.6	5.0	4.3	5.4	7.2	8.5
22	9.5	6.4	3.9	5.0	--	5.2	7.0	8.6
23	9.5	5.9	4.0	5.1	--	4.9	7.0	8.5
24	9.4	5.2	3.8	5.2	4.5	5.0	6.9	8.5
25	9.3	5.3	3.6	5.3	4.6	5.4	6.9	8.6
26	9.3	5.8	3.5	5.2	4.9	5.3	7.2	8.5
27	9.2	6.2	3.5	5.2	5.2	--	7.5	8.3
28	9.2	5.7	3.5	5.2	5.1	5.3	7.6	8.1
29	9.2	5.9	3.7	5.2	5.2	5.4	7.7	8.1
30	9.2	6.2	4.1	5.4	5.2	6.0	7.6	8.1
31		6.6		5.5	5.2		7.7	
Mean	9.8	7.3	5.4	5.8	4.7	5.4	6.9	8.1
Max	10.6	9.5	8.5	7.1	5.6	6.0	7.7	8.6
Min	9.2	5.2	3.5	4.5	3.7	4.9	6.1	7.4

Appendix A

NO. 2001-5

EXTENSION OF DOCKET NO. 77-20 CP (Revision 4)

DELAWARE RIVER BASIN COMMISSION

A RESOLUTION extending Docket No. D-77-20 CP (Revision 4) for one year to continue the experimental augmented conservation release program for the New York City Delaware Basin Reservoirs.

WHEREAS, Document No. 77-20 CP (Revision 4) specified the current augmented experimental release program and instituted a drought watch and a revised drought warning level for the three New York City Delaware Basin reservoirs beginning in May 1999 and ending on April 30, 2001; and

WHEREAS, Docket No. 77-20 CP (Revision 4) condition h. provides for an extension of the provisions of this Docket upon agreement of all parties to the 1954 supreme Court Decree; and

WHEREAS, the State of New York and New York City are in the process of negotiating to revised experimental release program to develop conservation releases more responsive to the water conditions downstream of the dams; and

WHEREAS, it is anticipated that the development and agreement of a revised experimental augmented conservation release program will not be completed until after April 30, 2001, the date at which the current program will automatically terminate; and

WHEREAS, the State of New York requested the Commission on February 27, 2001 to extend Docket No. 77-20 CP (Revision 4) for one calendar year until April 30, 2002;
now therefore

BE IT RESOLVED by the undersigned Commissioners and Parties to the Decree

Docket No. 77-20 CP (Revision 4) is hereby extended for one year to April 30, 2002.

/S/ Kevin C. Donnely
Kevin C. Donnelly, Chairman pro tem

/S/ Pamela M. Bush
Pamela M. Bush, Commission Secretary
and Assistant General Counsel

ADOPTED: April 19, 2001