REPORT OF THE RIVER MASTER

OF THE

DELAWARE RIVER

FOR THE PERIOD

DECEMBER 1, 1979 — NOVEMBER 30, 1980

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY NATIONAL CENTER
RESTON, VIRGINIA
1981

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by

Francis T. Schaefer and Robert E. Fish

UNITED STATES DEPARTMENT OF THE INTERIOR
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and

SPECIAL REPORT

OFFICE OF THE DELAWARE RIVER MASTER

United States Geological Survey

433 National Center, Reston, Virginia 22092

February 27, 1981

The Honorable
Warren E. Burger
Chief Justice of the Supreme Court
of the United States

The Honorable
Pierre S. duPont IV
Governor of Delaware

The Honorable
Brendan T. Byrne
Governor of New Jersey

The Honorable
Hugh L. Carey
Governor of New York

The Honorable
Richard L. Thornburgh
Governor of Pennsylvania

The Honorable
Edward I. Koch
Mayor of the City of New York

New Jersey v. New York et al
No. 5 Original, October Term 1950

Dear Sirs:

For the record and in compliance with the provisions of the Amended Decree of the United States Supreme Court entered June 7, 1954, I am trans-

mitting herewith the twenty-seventh Annual Report of the River Master of the Delaware River for the year December 1, 1979 to November 30, 1980.

This year, streamflow was in marked contrast to the previous 8 years, 1972-79, for which runoff was the highest in any 8 consecutive years since the beginning of record in 1939. The discharge of the Delaware River at Montague, New Jersey, adjusted for diversions and changes in reservoir storage, was only 68 percent of median.

At the beginning of this report year, storage in Pepacton, Cannonsville and Neversink Reservoirs of the City of New York was 87.6 percent of capacity, almost 33 percent greater than that of December 1, one year earlier, but less than storage on the same date in 1975, 1976, and 1977. By mid-April, runoff from snowmelt and precipitation resulted in the system reaching over 100 percent of capacity and all three reservoirs spilling. Supplies seemed ample although the seasonal decline started earlier than had been occurring during the past 5 years. Storage decreased in May and very much paralleled the operational record for the 1976-77 report year.

At mid-September, a time when storage normally remains fairly constant, or even increases with fall rains, the rate of depletion of the reservoirs accelerated. By mid-October, decreases in storage were as high as 14 billion gallons a week. On November 24, storage reached the lowest point of the year, 27.9 percent, but moderate rains then provided some relief and by November 30 storage had increased to 31.0 percent of capacity.

In early October, drought had impacted a number of communities in northern New Jersey. A question was raised as to the City of New York supplying New Jersey communities through interconnections in the Hudson River tunnels and on the bridges. The position of this office was that this would be permissable as long as reservoir storage was adequate to reasonably ensure needs of the City. A minor amount of water was supplied. On October 8, 1980, the Deputy Delaware River Master, at my request, presented to a meeting of the Delaware River Basin Commission in Trenton, New Jersey, a statement on the seriousness of the developing situation suggesting the need for attention by all parties. On October 15, this office issued a letter (see Appendix B) to the Advisory Committee members pointing out that storage was rapidly approaching the 40-percent capacity rule curve, considered to be the level for that time of the year, at which drought possibilities were imminent. In this letter it was proposed that an immediate reduction in diversions be effected and that the design flow at Montague be reduced from 1,750 to 1,650 cfs (cubic feet per second). After discussions at a meeting attended by members of the River Master Advisory Committee and the Basin Commission on October 17, it was agreed that the authorized rate of diversions by New York City would be reduced from 800 to 680 mgd (million gallons per day), diversions by New Jersey would be reduced from 100 to 65 mgd, and the target of the Montague design flow would be decreased to 1,655 cfs. Directives to accomplish the reductions were issued immediately through the Milford, Pennsylvania office.

By November 12 when storage had declined to 31.4 percent of capacity

as compared to 78 percent a year earlier, it was evident that further conservation measures were in order. I therefore proposed to the Advisory Committee that New York City diversions be restricted to an average of 600 mgd, that Montague design flow be reduced to 1,500 cfs and that New Jersey diversions continue to be limited to 65 mgd. At a meeting of the parties and the Commission on November 19 in Trenton, New Jersey, the following procedure was agreed upon:

> New York City diversions to be limited to 580 mgd and to be further reduced to 560 mgd by December 20, Montague design flow to be reduced to 1,560 cfs with a further reduction to 1,550 cfs by December 20, and New Jersey diversions to be unchanged at 65 mgd.

Directives to accomplish the foregoing objectives were issued immediately and on November 20 New York City diversions were reduced. Because of transit time below the reservoirs, several days passed before the newly designed releases affected the Montague flow. A low point in reservoir contents was reached on November 24 when storage amounted to only 27.9 percent of capacity. Precipitation on that date reversed the trend temporarily and storage at the end of the month and report year increased to 31.0 percent and was rising slowly.

During November New Jersey completed an emergency pipeline to divert 20 to 25 mgd from Lake Hopatcong in the Delaware River basin to Rockaway River to augment dwindling supplies of communities in the northeastern part of the State. Total withdrawals from this source and through the Delaware & Raritan Canal were held within applicable limits.

As the year ended, it was apparent that unless appreciable precipitation and runoff developed, depletion would reduce reservoir storage to or below the generally accepted drought level and that more severe conservation measures would become necessary.

During the year, the following individuals functioned as members of the River Master Advisory Committee:

Delaware	Dr. Robert R. Jordan Thomas P. Eichler
New Jersey	Daniel J. O'Hern Dirk C. Hofman
New York	Eldred Rich Edward A. Karath
New York City	Francis X. McArdle
Pennsylvania	Dr. Maurice K. Goddard R. Timothy Weston

Appreciation is expressed to all members for their cooperation and advice.

A special note of commendation is due to Dr. Goddard who retired from service for the Commonwealth of Pennsylvania during the year. Dr. Goddard was a constructive member of the group and he ably represented Pennsylvania for many years.

An experimental augmented conservation release program had been agreed to by all parties and had been placed in effect June 27, 1977. The program, which temporarily redistributed the excess-release quantity defined in the 1954 Decree, was terminated on May 31, 1980. There was some opposition to that termination. Therefore, I proposed to the Advisory Committee that a motion for modification of the Decree be presented to the Court if the parties desired to continue indefinitely the substantial deviation from the provisions of the Decree. No agreement was forthcoming on this proposal.

On regular operations, it is reported that diversions for water supply for New York City and releases to maintain the flow of the Delaware River at Montague during the year were made under the supervision of this office as provided in the Decree.

Diversions by New York City from the Delaware River basin reservoirs did not exceed the limit specified by the Decree and did not exceed the limits under the varying restrictions initiated in October. Diversions by the State of New Jersey did not exceed the limits imposed in Section V of the Decree and did not exceed the restrictions noted above.

During the year the River Master and staff participated in meetings of the Delaware River Basin Commission to assess the water supplies and to consider measures to ease the growing deficiencies. Upon invitation of the representatives of parties to the Decree, the River Master, or his assistants, met frequently with those representatives as an observer to their "good faith" negotiations. The negotiations concerned proposals for specific releases from the City reservoirs for conservation purposes, definition of drought in the basin, emergency measures to cope with severe droughts and other items. The negotiations were still in progress at the end of the report year.

The Geological Survey continued the operation of its field office of the Delaware River Master at Milford, Pennsylvania. Robert E. Fish, Deputy Delaware River Master, continued in charge of this office, assisted by William R. Bauersfeld and Beverly A. Roberts.

During the report year, the Milford office continued the weekly distribution of summary river data. These weekly reports contained preliminary data on releases from the New York City reservoirs to the Delaware River, diversions to New York City water-supply system, reservoir contents, daily segregation of flow of the Delaware River at the Montague gaging station, diversions through the Delaware & Raritan Canal and significant chloride concentrations in the river. The reports were made available to the State and City representatives on the Delaware River Master Advisory Committee and to other parties interested in the Delaware River oper-

ations. A special monthly summary of past hydrologic conditions supplemented during the low-flow season by an "outlook" of the river flow for the forthcoming month was made available to the representatives on the Advisory Committee. Upon request of the parties, a bi-weekly report was prepared containing data for precipitation, streamflow, storage, diversions and chloride concentrations during the drought.

Research on the Delaware River streamflow modeling progressed under the direction of James O. Shearman, U.S. Geological Survey, Harrisburg, Pennsylvania. This work is designed to simulate natural flows for the West Branch, East Branch, and the Neversink Rivers, and the main stem as far downstream as Trenton, New Jersey. The simulated flows are those which might have occurred if the reservoirs had not been constructed. Comparison of these flows with observed flows can be used to demonstrate the effects of the reservoirs and as a measure of their environmental impact. It can be shown, for instance, that low summertime flows on the Delaware River are now ordinarily much greater than those which would have occurred under natural conditions.

Section II of the accompanying report describes in detail Delaware River operations during the report year. As shown on page 25, the City of New York diverted a total of 244.568 billion gallons from the basin during report year ending November 30, 1980, and released 133.760 billion gallons from Pepacton, Cannonsville, and Neversink Reservoirs to the Delaware River during the same period. During the low flows from January 27 to March 10 and May 29 to November 26 (Montague dates), releases to the Delaware River from these reservoirs. totaled 121.915 billion gallons. The color graphs on plates 1 and 2 show the effect of these releases on the flow at the Montague gaging station.

Section III of the report describing water quality of the Delaware River estuary was prepared by Charles R. Wood, U.S. Geological Survey, Malvern, Pennsylvania, in collaboration with Mr. Fish. It contains data showing the extent of salinity invasion and other water-quality characteristics in the Delaware River estuary.

During the report year, Pennsylvania Power & Light Company was not required to make supplemental releases from Lake Wallenpaupack as provided in an agreement written in 1975 between the company and the City of New York and approved by this office.

The appreciation of the River Master and staff is expressed for the continued and excellent cooperation of all the representatives of the parties to the Decree. Once again, it is gratifying to report that New York City complied with the terms of the Decree and with the varying restrictions regarding diversions and releases from the reservoirs. New Jersey also complied with the restrictions applied to its diversions from sources in the basin.

An advance copy of this report was furnished to each party for comment prior to publication.

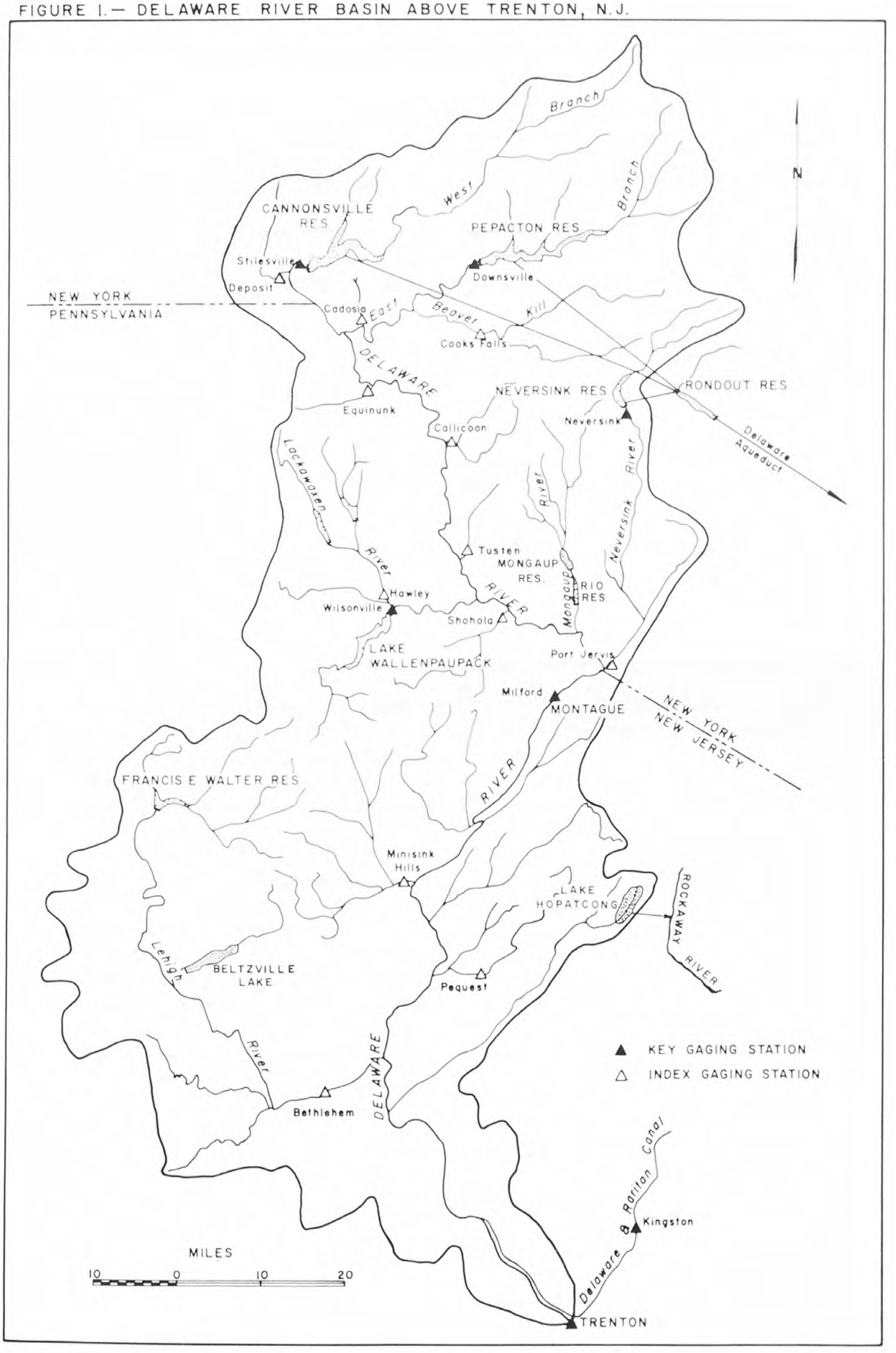
Sincerely yours,

Francis T. Schaefer, P.E.
Delaware River Master

Section II

REPORT OF DELAWARE RIVER OPERATIONS

FIGURE I.— DELAWARE RIVER BASIN ABOVE TRENTON, N.J.



OFFICE OF THE DELAWARE RIVER MASTER

United States Geological Survey

Milford, Pennsylvania 18337

February 13, 1981

Mr. Francis T. Schaefer, P.E.
Delaware River Master
U.S. Geological Survey
Reston, VA 22092

Dear Sir:

Transmitted herewith is my report on the hydrologic and hydraulic operations of the Delaware River basin as conducted by the Milford office under your direction during the year ending November 30, 1980. This report marks the twenty-seventh year of such activities since the inception of the Amended Decree of the United States Supreme Court, dated June 7, 1954.

Hydrologic conditions in the Delaware River basin during the year were generally in the below-normal range with runoff less than the lower quartile of the reference period,1941-70, occurring in four months. As a result of the deficiencies toward the end of the year, the rates of diversions and the Montague Formula release requirements were reduced to conserve water. This action was taken subsequent to agreement by all parties to the Decree to resolutions adopted by the Delaware River Basin Commission. Diversions from the basin to New York City and to New Jersey were below limits authorized in the Decree and the resolutions. Releases from the reservoirs were made as prescribed under the Decree, under the Memorandum of Agreement for the temporary redistribution of the excess-release quantity and under the resolutions. The hydrologic procedures developed previously were used to guide operations in this office.

The advice and cooperation of your office and the members of the Delaware River Master Advisory Committee are greatly appreciated. Thanks are also given to personnel of the offices of the United States Geological Survey and National Weather Service, New York City Department of Environmental Protection, Bureau of Water Supply and Board of Water Resource

Development, Pennsylvania Power & Light Company, Orange and Rockland Utilities, Inc., gage readers, and others for supplying data needed in this report. Special credit is given to William R. Bauersfeld and Beverly A. Roberts for their capable assistance in preparing this report.

Sincerely yours,

Robert E. Fish, P.E.
Deputy Delaware River Master

Section II

REPORT OF DELAWARE RIVER OPERATIONS

The 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 reservoirs of the City of New York to the Delaware River to be made under the supervision and direction of the River Master. A Memorandum of Agreement prepared by the River Master provided for temporary redistribution of the excess-release water from these reservoirs December 1, 1979 to May 31, 1980.[1/] Resolutions restricting diversions and release requirements beginning October 17 were adopted by the Delaware River Basin Commission with the consent of parties to the Decree. This report describes the operations during December 1, 1979 to November 30, 1980.

Definitions of Terms and Procedures

The following definitions apply to various terms and procedures as used in operations in this report. A table for converting Inch-pound units to International System (SI) Units is given on page 17. The map of the Delaware River basin above Trenton, N.J. (fig. 1), indicates the location of pertinent streams and reservoirs.

Time of day. - Time of day is expressed in 24-hour eastern standard time, which included a 23-hour day April 27 and a 25-hour day October 26.

Rate of flow. - Mean discharge for any stated 24-hour period, in cubic feet per second (cfs) or million gallons per day (mgd).

Rate of flow at Montague. - Daily mean discharge of the Delaware River at Montague, N.J., on a calendar-day basis.

Reservoir-controlled releases. - Controlled releases from reservoirs passed through outlet valves in the dams or through turbines in powerplants. This does not include spillway overflow at the reservoirs.

Releases from Pepacton and Neversink Reservoirs are usually made at constant rates for 24 hours; directed releases from Cannonsville Reservoir are usually made at two rates during a 24-hour period, and the quantity released is treated as an average rate for 24 hours. At times during 1980, the larger releases from Cannonsville Reservoir were made in steps by New York City in response to an understanding with New York State to effect the change in stage downstream over a longer period of time than would have been obtained from a single operation of release valves. Releases from Wallenpaupack and Mongaup powerplants are chiefly made as a result of peak-power demands and are treated as average rates for 24 hours.

Uncontrolled runoff at Montague. - Runoff from the drainage area above Montague exclusive of the drainage areas above the Pepacton, Cannonsville, Neversink, Wallenpaupack, and Mongaup dams but including spillway overflow at these dams.

1/ Schaefer, F.T. and Fish, R.E.
Report of the River Master of the Delaware River, 1979, U.S. Geol. Survey.

Point of maximum reservoir depletion. - Elevation of the top of the highest outlet, sometimes referred to as minimum full-operating level.

Storage or contents. - Usable volume of water in a reservoir. Unless otherwise indicated, volume is computed on basis of level pool and above the point of maximum depletion. Reservoir contents were observed at 0900 daily.

Capacity. - Total usable volume between the point of maximum depletion and the elevation of the lowest crest of the spillway.

Diversions. - The City of New York diverts water from Pepacton, Cannonsville, and Neversink Reservoirs in the upper Delaware River basin through the East Delaware, West Delaware, and Neversink Tunnels, respectively, to its water-supply system.

The State of New Jersey diverts water from the Delaware River through the Delaware & Raritan Canal and beginning November 18, from Lake Hopatcong through a pipeline to Rockaway River, as a drought emergency measure.

Excess quantity and seasonal period for its release. - As defined in the Decree, the excess quantity of water equals 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 from all its sources of supply obtainable without pumping, except that the excess quantity should not exceed 70 billion gallons. Each year the "seasonal period" for release of excess quantity begins on June 15. The design rate for that period becomes effective at Montague on that date and continues in effect until the following March 15, or until the cumulative total of excess-release credits becomes equal to the seasonal quantity, whichever occurs first. During 1979, an exception was made under a Memorandum of Agreement for the temporary redistribution of the excess-release quantity from June 1, 1979, to May 31, 1980, unless the excess-release quantity was expended at an earlier date.

Daily excess-release credits. All releases under the Memorandum of Agreement were considered as directed by the River Master. Daily credits and deficits were credited under a procedure begun June 1, 1978, due to the greatly reduced excess-release quantity as compared with the excess-release quantity available at the time the initial Memorandum of Agreement was drawn. Credit was given for any release over the directed rate, except that no credit was made on a day when spill equaled or exceeded the augmented conservation rate. Credit was given for the difference between actual augmented conservation releases and minimum conservation releases.

Daily credits and deficits during the seasonal period beginning June 15 are equal to the algebraic difference between the daily mean discharge at Montague and 1,750 cfs; however, 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, with the following exception. During the seasonal period, credits are also made for part or all of other prior releases from Pepacton, Cannonsville, and Neversink Reservoirs contributing to daily mean discharge at Montague between the excess-release rate and 1,750 cfs. An example of credits made for other releases is shown in table 8 on July 4 when 83 cfs from these reservoirs with 1,797 cfs from uncontrolled sources and powerplant was sufficient to make

up the excess-release rate of 1,880 cfs at Montague.

Acknowledgments

A part of the hydrologic data is presented as records of the U.S. Geological Survey gaging stations. These records were collected, computed, and furnished by the Offices of the U.S. Geological Survey at Albany, New York, Malvern, Pennsylvania, and Trenton, New Jersey, in cooperation with the States of New York, New Jersey, and Pennsylvania, and the City of New York and are found in tables 1 to 7.

The River Master daily operation records were prepared by the Milford Office of the Delaware River Master from hydrologic data collected principally on a day-to-day basis. Data for these records were collected and computed by the Milford Office or were furnished by agencies, as follows: Data from Pepacton, Cannonsville, and Neversink Reservoirs by the New York City Department of Environmental Protection, Bureau of Water Supply; from Lake Wallenpaupack by the Pennsylvania Power & Light Company; and from Mongaup Reservoir by Orange and Rockland Utilities, Inc.

Factors for Converting Inch-pound Units to International System (SI) Units

Multiply Inch-pound units	By	To obtain SI units
LENGTH		
inches	25.4	millimeters (mm)
feet	.3048	meters (m)
miles	1.609	kilometers (km)
AREA		
square miles	2.590	square kilometers (km^2)
VOLUME		
million gallons	3,785	cubic meters (m^3)
billion gallons	3.785	cubic hectometers (hm^3)
cfs-days	.002447	cubic hectometers (hm^3)
FLOW		
million gallons per day (mgd)	.04381	cubic meters per second (m^3/s)
cubic feet per second (cfs)	.02832	cubic meters per second (m^3/s)

Abstract

The 1980 report year, December 1, 1979, to November 30, 1980, was a year of below-normal precipitation and much below average runoff in the Delaware River basin. Pepacton, Cannonsville, and Neversink Reservoirs

of the City of New York spilled in the spring of the year.

The annual flow of Delaware River at Montague, adjusted for change in reservoir storage and diversions, was 32 percent below median. Diversions and releases from the reservoirs of the City of New York were made within the terms of the Amended Decree, and releases December 1, 1979, to May 31, 1980, were made to conform to the Memorandum of Agreement unanimously consented to on May 22, 1979. Reductions in diversions and releases adopted by the Commission with the consent of parties to the Amended Decree were made October 18 to November 30 to conserve the water supply in the reservoirs. Diversions by New Jersey through the Delaware & Raritan Canal were within prescribed limits of the Amended Decree and within the reductions adopted for October 18 to November 30.

The combined usable contents of Pepacton, Cannonsville, and Neversink Reservoirs on December 1, 1979, was 87.6 percent, and on November 30, 1980, the combined contents was 31.0 percent of capacity.

Precipitation

Precipitation observed on the basin above Montague for the 1980 report year was below normal, totaling 36.31 inches. Monthly precipitation ranged from excessive to deficient as measured by the upper and lower quartiles of the reference period 1941-70. Precipitation for January was less than previous precipitation for that month in the period of record while that for March was the second highest for that month. Precipitation for February and May was second lowest of record for the respective months. The monthly precipitation during the report year is shown in the following table:

Precipitation, in inches
Delaware River basin above Montague, N.J.

Month	December 1940 to November 1979 Average	December 1979 to November 1980 Amount	Percent of average
December	3.57	1.51	42
January	3.06	.73	24
February	2.74	1.26	46
March	3.32	5.87	177
April	3.57	5.12	143
May	4.17	1.45	35
June	3.91	4.29	110
July	4.13	3.59	87
August	4.07	2.99	73
September	3.78	2.41	64
October	3.37	3.68	109
November	3.76	3.41	91
12 months	43.45	36.31	84

These data were computed from records collected by the National Weather Service, New York City Department of Environmental Protection, Bureau of Water Supply, and the River Master at ten stations distributed over the basin area above Montague.

December to May is generally considered the normal time of year when surface- and ground-water reservoirs fill. During this period in 1979-80, precipitation of 15.94 inches was observed, which was 78 percent of the 39-year average. During June to November, precipitation of 20.37 inches was observed, which was 88 percent of the 39-year average. The maximum monthly precipitation observed during the year at any of the ten stations was 7.46 inches in March at Oakland Valley, N.Y.; the minimum monthly precipitation observed was 0.25 inch in January at Narrowsburg, N.Y.

Operations December to May

During the first half of the report year, precipitation was below average and varied considerably by months. Pepacton and Cannonsville Reservoirs spilled for several weeks; Neversink Reservoir spilled on 2 days.

On December 1, 1979, Pepacton Reservoir contained 112.975 billion gallons of water in storage above the point of maximum depletion, or 80.6 percent of the reservoir's storage capacity of 140.190 billion gallons. Cannonsville Reservoir contained 97.379 billion gallons, or 101.7 percent of the reservoir's storage capacity of 95.706 billion gallons and Neversink Reservoir contained 26.834 billion gallons, or 76.8 percent of the reservoir's storage capacity of 34.941 billion gallons. The combined storage in the three reservoirs as of December 1 was 237.188 billion gallons, or 87.6 percent of their combined capacities.

During the winter and spring, part of the inflow to the three reservoirs was required for diversions and releases. Diversions to Rondout Reservoir during December 1 to May 31 totaled 122.011 billion gallons. The equivalent diversion rate during June 1, 1979 to May 31, 1980 was 701 mgd. The diversions did not exceed the limit of 800 mgd specified by the Decree. Releases solely for conservation, as prescribed under the Memorandum of Agreement, were made from each reservoir by New York City during December 1, 1979, to May 31, 1980, except for days when the anticipated discharge at Montague, exclusive of water released from the City reservoirs, fell below the design rate of 1,750 cfs and required releases to satisfy the Montague Formula.

On June 27, 1977, a Memorandum of Agreement was placed in effect, which provided for a temporary redistribution of the excess-release quantity. Under the Agreement, and its extension to May 31, 1980, releases from the City reservoirs were to be designed to provide 1,750 cfs at Montague and to the extent the annual excess quantity would permit to provide the following augmented conservation releases:

Reservoir	Releases in cubic feet per second	
	April 1 to October 31	November 1 to March 31
Pepacton	70	50
Cannonsville	45 (except 325 June 15 to August 15)	33
Neversink	45	25

and additional releases in amounts determined by the State of New York for the relief of thermal stress in the stream reaches below the reservoirs, the total of which was not to exceed 6,000 cfs-days per year. All releases from the City reservoirs were considered as directed because, in addition to directed releases designed to maintain 1,750 cfs at Montague, all other daily releases included a part of the excess-release quantity.

In the previous seasonal period which began June 1, 1979, under the Memorandum of Agreement, there had been a total excess quantity of water of 26,919 cfs-days (17.401 billion gallons). By November 30, 1979, 12,576 cfs-days (8.129 billion gallons) had been released from the reservoirs and credited at Montague.

During the remainder of the seasonal period, December 1, 1979, to May 31, 1980, the anticipated discharge at Montague, exclusive of water released from New York City's reservoirs, fell below the design rate of 1,750 cfs on 50 days, and releases from the City's reservoirs were directed in amounts to provide the design rate at Montague for those days. Those releases and those from the experimental release program brought the excess-release water credit to 22,604 cfs-days (14.612 billion gallons) on May 31 and the requirements terminated for the release of the 4,315 cfs-days (2.789 billion gallons) remaining of the initial 26,919 cfs-days (17.401 billion gallons) of the excess-release quantity.

During December 1 to May 31, there were 26 days when the discharge at Montague was less than 1,750 cfs and 157 days when the discharge was equal to or above 1,750 cfs. On days when releases were directed and there were deficiencies or excesses in flow, such differences usually were attributable to difficulties in determining the uncontrolled flow because of conditions associated with the cold weather.

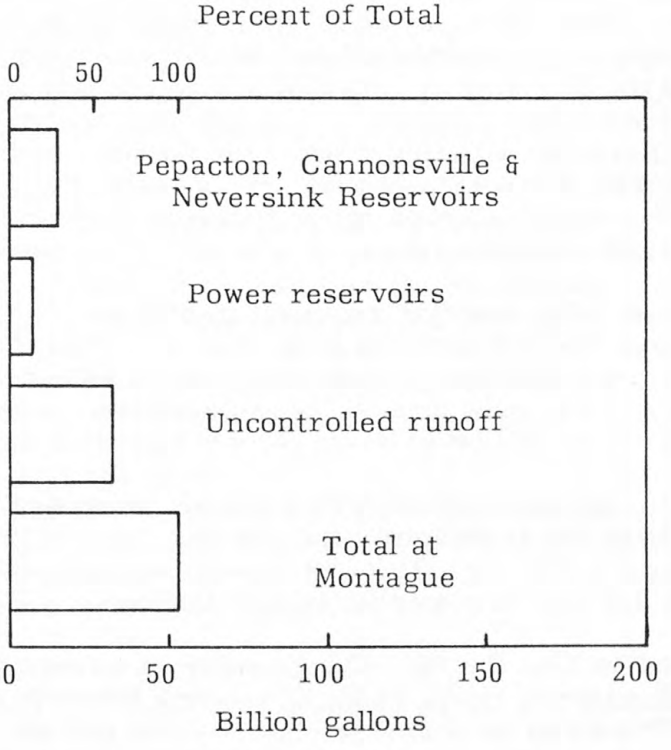
The hydrographs on plate 1 for January 1 to March 31 cover the winter releases and show the total discharge at Montague, the part derived from uncontrolled runoff downstream from the reservoirs, the part contributed by the power reservoirs, and the part contributed by Pepacton, Cannonsville, and Neversink Reservoirs. In analyzing the water budget at Montague, the uncontrolled runoff is the residual of observed flow less releases from all reservoirs and is subject to all the errors in observations and transit times of the several components of flow. Because of these unavoidable errors, the computed hydrograph of uncontrolled flow is ragged.

The following tabulation summarizes diversions and releases made under the provisions of the Montague Formula and other contributions to the flow of the Delaware River at Montague during January 27 to March 10, which includes most of the days for which releases were directed.

Diverted to Rondout Reservoir			45,816 cfs-days
Delaware River at Montague	Advance estimates (cfs-days)		Observed operations (cfs-days)
New York City releases (Pepacton, Cannonsville, Neversink)			
Directed	a 22,936	b	23,013
Wallenpaupack & Mongaup power releases	7,652		9,985
Runoff from uncontrolled area	46,528		49,052
Flow at Montague			82,050

a Directed release as designed
b Actual release

The contributions to flow of the Delaware River at Montague during January 27 to March 10 are also shown in the following graph:



In a simulated operation under the Montague Formula, including use of the balancing adjustment, approximately 22,600 cfs-days (14.6 billion gallons) of the total excess-release quantity of 26,919 cfs-days (17.401 billion gallons) would have been expended June 15 to November 30, 1979. In continuing the simulated operation, the remainder of the total excess-release quantity would have been expended by March 5, approximately.

Inflow to the City's reservoirs during December 1 to May 31 generally exceeds draft rates and therefore increases storage. The average inflow to Pepacton, Cannonsville, and Neversink Reservoirs for these 6 months during the 39-year period, December 1940 to May 1979, was 307.5 billion gallons. During the corresponding 6 months of the current report year, inflow to the three reservoirs totaled 236.956 billion gallons. The excess of inflow over the demand increased water storage in these three reservoirs in 1980 to 258.894 billion gallons by May 31.

Operations June to November

During the second half of the report year, precipitation was slightly below average, and deficiencies augmented those of the first half year. During the period, part of the storage and inflow to the New York City reservoirs was required for diversions and releases. Diversions to Rondout Reservoir during June 1 to November 30 totaled 122.557 billion gallons. The equivalent diversion rate did not exceed the limit specified by the Decree and was 691 mgd on October 17. With the consent of parties to the Decree to Resolution No. 80-20 adopted by the Delaware River Basin Commission October 17, diversions were limited to an average of 680 mgd beginning October 18. Subsequently, Resolution No. 80-24, adopted November 19, further restricted the diversions to 580 mgd. Diversions October 18 to November 19 and November 20-30 averaged 635 and 506 mgd, respectively. Releases were required to satisfy the Montague Formula on days when the anticipated discharge at Montague, exclusive of water released from the City reservoirs, fell below the design rate. Releases at augmented conservation rates were made at other times from each reservoir by the City of New York.

During June 1-14, the flow required to be maintained in the Delaware River at Montague was the minimum basic rate of 1,750 cfs. The forecasted discharge, exclusive of releases from Pepacton, Cannonsville, and Neversink Reservoirs, was less than 1,750 cfs each day, and releases were directed as required. The flow at Montague was less than 1,750 cfs on 4 days.

On June 15, the seasonal period began for release of the excess quantity of water from the reservoirs, and the design rate to be maintained at Montague became 1,880 cfs. This rate was composed of the basic rate of 1,750 cfs plus 130 cfs of required excess releases.

As defined in the Decree, the quantity of excess water in the aggregate was 83 percent of the amount by which the estimated consumption during 1980 (limited to an increase of $7\frac{1}{4}$ billion gallons over actual consumption in any previous year) was less than New York City's estimate of

safe yield during 1980, obtainable from all its sources without pumping and not to be less than 1,665 mgd. In releasing the excess quantity, the design rate at Montague was the minimum basic rate plus the excess quantity divided by 120 days. The City was not required to release at rates exceeding the capacity of the release works.

The New York City Department of Environmental Protection, Bureau of Water Supply, furnished the River Master with the following advance data for the 1980 calendar year:

1. The estimated continuous safe yield, from all the City's sources, obtainable without pumping, is 1,665 mgd, or a total during the calendar year 1980 of 1,665 x 366 days = 609.390 billion gallons.

2. The estimated consumption that the City must provide from all its sources of supply during the calendar year 1980 is 590.426 + 7.250 = 597.676 billion gallons.

On the basis of the provisions of the Decree and the above data, the aggregate quantity of excess-release water was 83 percent of (609.390-597.676) or 9.723 billion gallons. The Montague design rate during the excess release period beginning June 15, 1980, computed

$$1{,}750 \text{ cfs} + \frac{9.723 \text{ billion gallons} \times 1{,}547 \text{ cfs/bgd}}{120 \text{ days}}$$

$$= 1{,}880 \text{ cfs.}$$

Data on consumption of water by the City of New York for each calendar year, beginning in 1940, are shown in table 14.

On the basis of advance estimates, releases from the reservoirs designed to maintain a rate of 1,880 cfs at Montague were required 109 days during June 15 to October 10. During those 109 days, there were 31 days when the discharge at Montague was less than 1,750 cfs, 23 days between 1,750 and 1,880 cfs, and 55 days above 1,880 cfs.

By October 10, the entire excess-release quantity of 9.723 billion gallons was released and credited at Montague and the requirements for excess releases terminated.

During October 11-18, the flow to be required at Montague was 1,750 cfs. The forecasted discharge exclusive of releases from Pepacton, Cannonsville and Neversink Reservoirs was less than 1,750 cfs each day, and releases were directed as required. The flow was less than 1,750 cfs on 6 days.

Resolution no. 80-20 adopted October 17 by the Commission with the consent of parties to the Decree required releases from New York City reservoirs designed to maintain a reduced rate of 1,655 cfs at Montague. This

flow rate was designed to be effective October 19 and was continued to November 20. Resolution No. 80-24 adopted November 19 further reduced the design rate for Montague to 1,560 cfs, which was executed beginning November 21. The forecasted discharge exclusive of releases from Pepacton, Cannonsville, and Neversink Reservoirs was less than 1,655 cfs 29 days during October 19 to November 20 and less than 1,560 cfs 6 days during November 21-30, and releases were directed as required.

During June 1 to November 30, releases were directed on 166 days designed to maintain the specified rates at Montague. On the remaining 17 days, New York City made releases from its reservoirs for conservation purposes or for the relief of thermal stresses downstream in accordance with a regulation of New York State.

On days of directed releases when there were deficiencies or excesses in flow, such differences were attributable to the uncontrolled flow, weather adjustment, or powerplant releases being other than those anticipated.

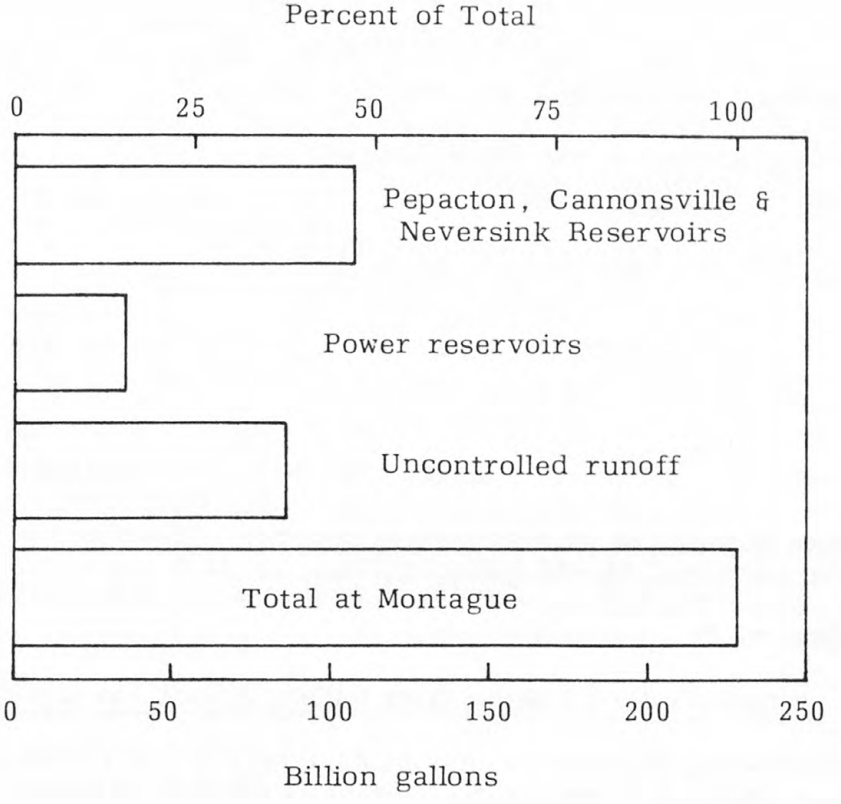
The hydrographs of plate 2, May 20 to November 30, show the total discharge at Montague; the part derived from uncontrolled runoff downstream from the reservoirs; the part contributed by the power reservoirs; and the part contributed by Pepacton, Cannonsville, and Neversink Reservoirs. In analyzing the water budget at Montague, the uncontrolled runoff downstream from the reservoirs was computed as the residual of observed flow less releases from all reservoirs and was subject to all the errors in observations, transit times, and routing of the several components of flow. Because of these unavoidable errors, the computed hydrograph of uncontrolled runoff was somewhat ragged.

The following tabulation summarizes diversions and releases made under the provisions of the Montague Formula, Resolutions No. 80-20, 80-24, and by New York City in accordance with a New York State regulation, and other contributions to the flow of the Delaware River at Montague during May 29 to November 26.

Diverted to Rondout Reservoir		190,026 cfs-days
Delaware River at Montague	Advance estimates (cfs-days)	Observed operations (cfs-days)
New York City releases (Pepacton, Cannonsville, Neversink)		
Directed	a 158,258	b 158,683
Other		6,906
Wallenpaupack & Mongaup power releases	46,286	54,120
Runoff from uncontrolled area	128,715	133,731
Flow at Montague		353,440

a Directed release as designed
b Actual release

The contributions to flow of the Delaware River at Montague during May 29 to November 26 are also shown in the graph below:



Computations by the River Master's Office indicated that flow at Montague during November 27-30 would be above 1,560 cfs.

Summary

From December 1, 1979, to November 30, 1980, diversions to Rondout Reservoir totaled 244.568 billion gallons, and all releases from the New York City reservoirs to the Delaware River totaled 206,926 cfs-days (133.760 billion gallons).

During the year, maximum storage in Pepacton Reservoir was 141.765 billion gallons, or 101.1 percent of capacity, on April 13. Maximum storage

in Cannonsville Reservoir was 99.456 billion gallons, or 103.9 percent of capacity, on April 1. Maximum storage in Neversink Reservoir was 35.090 billion gallons, or 100.4 percent of capacity, April 16. The maximum combined storage in the three reservoirs during the year was 275.471 billion gallons, or 101.7 percent of capacity, on April 12.

Minimum storage during the year in Pepacton Reservoir was 51.620 billion gallons, or 36.8 percent of capacity on November 24. The minimum storage in Cannonsville Reservoir was 20.301 billion gallons, or 21.2 percent of capacity on November 20. Minimum storage in Neversink Reservoir was 3.321 billion gallons, or 9.5 percent of capacity on November 24. Minimum combined storage in the three reservoirs was 75.484 billion gallons, or 27.9 percent of capacity, November 24.

A resume of the combined storage of the three reservoirs on the first day of month June 1967 to November 1980 is shown in figure 3. Storage figures for June, July, October and November, 1980, were less than those for the respective previous months. During other months of 1980, storage was within the range between highest and lowest storage of earlier years.

On November 30, Pepacton Reservoir contained 53.927 billion gallons or 38.5 percent of capacity. Cannonsville Reservoir contained 26.345 billion gallons, or 27.5 percent of capacity. Neversink Reservoir contained 3.761 billion gallons, or 10.8 percent of capacity. Combined storage in the three reservoirs was 84.033 billion gallons, or 31.0 percent of their combined capacity. During the year, combined storage decreased 151.974 billion gallons, or 56.1 percent of capacity.

Supplementary Release from Wallenpaupack Powerplant

An agreement between Pennsylvania Power & Light Company and the City of New York concerned supplementary releases from Wallenpaupack hydroelectric powerplant upon request of the Delaware River Basin Commission to compensate for water consumed at the Company's Martins Creek steam-electric generating station should the flow of the Delaware River at Trenton, N.J. become less than 3,000 cfs. No supplementary release was requested during the year.

Water Budget, Delaware River at Montague, N.J.

The data and computations of the water budget formed the basic operation records required to carry out the River Master's specific responsibilities with respect to the Montague Formula during the report year. The water budget consisted chiefly of two parts: (1) segregation of the daily average flow at Montague among its various source components and (2) advance estimates of the daily average flow at Montague, exclusive of controlled releases from New York City's reservoirs. In these water-budget computations, the time intervals required for water to travel from the various sources to Montague were taken into account.

Discharge of the Delaware River at Montague was composed of the fol-

lowing source components:

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

2. Controlled releases from Mongaup Reservoir on Mongaup River in the production of hydroelectric power.

3. Uncontrolled runoff from the area above Montague.

4. Controlled releases from Pepacton, Cannonsville, and Neversink Reservoirs of the City of New York.

The release from the City's reservoirs necessary to maintain the applicable rate of flow at Montague was computed from the advance estimates of flow at Montague, exclusive of controlled releases from the City's reservoirs.

Time of Transit

The following schedule of average times for the effective transit of water from the various sources of controlled supply to Montague was used for discharge routing during the 1980 report year, except for January 13 to March 20.

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

This schedule was developed from reservoir and powerplant operations and gaging-station records of prior years and was found generally suitable. At times, noticeable exceptions occur, e.g., when a large release from Cannonsville Reservoir follows a small one, a large part of the release is expended in filling the channel en route, and the remainder may appear at Montague as much as 12 hours late. During the winter, the cold weather formed ice in the streams, which, together with the low streamflow, gradually increased the resistance to streamflow and lengthened the time of transit. Based upon the probable amount of ice in the streams and the experiences of several past winters, times of transit were lengthened to the following:

Source	Jan. 13 to Mar. 20 Hours	Feb. 19 to Mar. 18 Hours
Pepacton Reservoir	84	
Cannonsville Reservoir	72	
Neversink Reservoir	57	
Mongaup Reservoir		24

With melting and breakup of the river ice, transit times from these reservoirs to Montague lessened, and transit times for average open-river conditions were resumed March 21.

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

In the daily operations, it was necessary that the River Master utilize: (1) discharges computed from recorded or reported stream gageheights for various 24-hour periods without benefit of concurrent specific information that changes in stage-discharge relations might have occurred; (2) daily discharge from New York City's three reservoirs obtained from venturi meters; (3) rainfall reports for the previous 24 hours; (4) actual powerplant operations converted to daily discharge; (5) advance estimates of power demand converted to daily discharge; (6) advance estimates of anticipated uncontrolled runoff at Montague; and (7) average times for routing of water from the several sources. Variable and usually minor errors of estimate occur in projecting data, but these data must be used in the daily design and direction of releases from New York City reservoirs.

The River Master daily operation record of reservoir releases and daily segregation of flow among the various source components contributing to the flow of the Delaware River at Montague is shown in table 8.

The arrangement of data conforms with the downstream movement of water from the various sources to Montague. A horizontal summation of data in the table is equivalent to routing the various contributions to Montague, using the schedule on page 27 for travel time of water.

The uncontrolled runoff was computed by subtracting the contributions of the several other sources from the observed discharge at Montague.

The computation of the daily excess-release credits was made as outlined in the definition of terms and procedures (p. 15).

Computation of Anticipated Flow at Montague

The time of transit of water from Pepacton Reservoir to Montague was greater than that from any other reservoir above Montague; therefore, the time of daily directed releases to maintain prescribed rates of flow at Montague was based on time of transit from Pepacton Reservoir. Releases from Cannonsville and Neversink Reservoirs were timed to arrive at Montague concurrently with releases from Pepacton Reservoir. To allow for the actual difference in transit times, daily directed releases began at Pepacton at 1200, at Cannonsville at 2400, and at Neversink Reservoir at 1500 the following day.

The determination of the amount of release required from the City's reservoirs to maintain specified rates of flow at Montague was based on estimates of releases from Lake Wallenpaupack and Mongaup Reservoir and an estimate of the uncontrolled runoff at Montague. Taking into account the time of transit from these sources to Montague, this determination required

that advance estimates of the following components be made on the morning of each day; (1) the expected release of water from Lake Wallenpaupack for power production for a 24-hour period, beginning at 0800, 2 days later; (2) expected release of water from Mongaup Reservoir for power production for a 24-hour period, beginning at 1600, 2 days later; and (3) expected uncontrolled runoff at Montague 3 days later. The River Master daily operation record for computing daily directed release from the City's reservoirs during the periods of low flow is shown in table 9. Included December 1 to May 31 are additions under the Memorandum of Agreement to the daily directed release to maintain minimum releases when required. Releases for relief of thermal stress, as requested by New York State, were accommodated by New York City by distributing among the reservoirs the releases directed by the River Master.

The electric power companies cooperated fully in furnishing advance estimates of powerplant release (table 9). Pennsylvania Power & Light Company committed itself to a large effort to follow its given schedule, within practicable limits. As the hydroelectric plants were used chiefly for meeting peak-power demands of the system, advance estimates were subject to many modifying factors, such as the influence of the vagaries of weather upon peak-power demand, and unpredictable transmission and mechanical difficulties in electric-system operation. As a result, the actual use of water for power generation was at times at considerable variance with the advance estimates that were used by the River Master's office in design computation. Furthermore, it was impractical for the companies to estimate their probable operation for any period other than 24 hours. In the estimates for the Wallenpaupack plant, the time factor was of little concern, as power operation during periods of low flow was usually between 0800 and 2400, which fell within the 24-hour period beginning at 0800. In routing the Mongaup Reservoir release estimates, some error was introduced at times, as the power operation during periods of low flow was usually between 0700 and 2200, which spans the 1600-to-1600 routing period.

For computation purposes during periods of low flows, the estimate of uncontrolled runoff at Montague 3 days in advance (or 4 days in part of the winter period) was treated as two items: (1) runoff from 2,176 square miles of uncontrolled drainage area above Montague, based on conditions over the drainage areas as of 0800 on the morning the estimate was made; and (2) estimated increase in runoff from precipitation forecasted to occur on the day the estimate was made and the 2 following days, with the exception that during the winter period, January 13 to March 20, consideration was also given to forecasts for the fourth day. Estimated quantities for these items are shown in table 9.

During the winter period, the advance estimate of the uncontrolled runoff (present conditions) was based on records for nearby gaging stations and on the recession curve of the uncontrolled flow at Montague projected to the date, 3 (or 4) days hence, under design.

During open-river conditions, the advance estimate of uncontrolled

runoff (present conditions) was based on discharges as of 0800 at the following gaging stations:

Station	Drainage area (square miles)
Beaver Kill at Cooks Falls, N.Y.	241
Cadosia Creek at Cadosia, N.Y.	17.7
Oquaga Creek at Deposit, N.Y.	66.4
Equinunk Creek at Equinunk, Pa.	56.3
Callicoon Creek at Callicoon, N.Y.	111
Lackawaxen River at Hawley, Pa.	290
Shohola Creek near Shohola, Pa.	83.6
Tenmile River at Tusten, N.Y.	45.0
Neversink River at Port Jervis, N.Y.	333

The procedure for computing the advance estimate combined a routing and recession (as applicable) of the 0800 discharges of the Beaver Kill, Oquaga, Equinunk, Callicoon and Shohola Creeks, Tenmile, Lackawaxen, and Neversink Rivers gaging stations to Montague, with a computed yield from the remaining ungaged, uncontrolled drainage area. Releases from Neversink Reservoir were deducted from discharge of the Neversink River site. The yield from that remaining uncontrolled drainage area was estimated by using as indexes the 0800 discharges of Cadosia, Oquaga, Equinunk, and Callicoon Creeks, and Tenmile and Lackawaxen Rivers with routing and recession by individual gaging stations.

The advance estimate of increase in runoff from precipitation is shown in table 9 under the heading of "Weather Adjustment." The National Weather Service Office, Philadelphia, Pa., cooperated throughout the low-flow period by furnishing quantitative forecasts of average precipitation over the drainage area above Montague and air temperatures for each day of the 3-day period, except during the winter period, when forecasts were often provided for each day of a 4-day period. During the winter, the probable increase in runoff was estimated from the current state of snow and ice and from forecasted temperature and precipitation for the several days under consideration. During open-river conditions, runoff from the forecasted precipitation was estimated from previously established relationships.

The total anticipated flow at Montague, exclusive of release from the City's reservoirs (table 9), was the sum of the forecasted releases from the power reservoirs, the estimated uncontrolled runoff under then current conditions, and the weather adjustment. The amount by which this computed flow was less than the prescribed Montague rate indicated the expected deficiency at Montague, which would have to be made up by corresponding releases from New York City reservoirs.

There were times when revised forecasts of weather or powerplant re-

lease in substantial amount became available before the completion of the required release from New York City reservoirs. At such times, the release required from New York City reservoirs was again computed on the basis of the revised information, and the release required was changed to the revised indicated deficiency. Usually this procedure resulted in a reduced release requirement from New York City reservoirs and the conservation of the water affected by the change. Only the final figures are shown in table 9.

When the estimates of anticipated inflow, exclusive of New York City releases, are too high, insufficient water is released, and, when too low, more water is released than necessary. Such deviations from the estimates are unavoidable. However, any cumulative deviations in the estimating procedure over a period of time should be reduced or eliminated. An adjustment for the deviations was based on the amount by which the cumulative directed releases were greater or less than the cumulative releases actually required to maintain the prescribed rate of flow at Montague. The cumulative difference between directed and actually required releases was arbitrarily divided by minus 10 to spread the balancing adjustment over 10 days. The mechanics of determining the balancing adjustment were accomplished in columns 9 to 14, table 9. As the cumulative difference could be determined only after the actual flow at Montague was computed, the balancing adjustment was entered in column 7 four lines below its computation in column 14. The balancing adjustment was applied June 19 to October 10 and was helpful in reducing cumulative errors and in conserving water.

Diversions to New York City Water Supply

Table 10 shows diversions from Pepacton, Cannonsville, and Neversink Reservoirs to the New York City water-supply system during the report year. The tabulation includes a running account of the equivalent rate of the combined diversions from the reservoirs, computed as prescribed by the Decree December 1 to October 17 and by the Resolutions October 18 to November 30. The tabulation shows that the maximum equivalent diversion rate of the Decree or the average rates of the Resolutions were not exceeded at any time under the respective authorizations.

Storage in New York City Reservoirs

The New York City Board of Water Supply determined the "point of maximum depletion" and other pertinent reservoir levels and contents of Pepacton, Cannonsville, and Neversink Reservoirs as follows:

Reservoir level	Pepacton Res.		Cannonsville Res.		Neversink Res.	
	Elev. (feet)	Contents (billion gallons)	Elev. (feet)	Contents (billion gallons)	Elev. (feet)	Contents (billion gallons)
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		1,020.5		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.

Tables 11, 12, and 13 show storage in Pepacton, Cannonsville, and Neversink Reservoirs, respectively, above "point of maximum depletion" or minimum full-operating level.

Analysis of Forecasts

Forecasts of the flow at Montague based on the anticipated flow of the several components (exclusive of the release from the City's reservoirs) differ somewhat from those actually experienced on most days, even under the most favorable conditions. The daily variations are usually largely compensating. Forecasts in 1980 were compared with actual uncontrolled runoff and powerplant releases during January 27 to March 10 and May 29 to November 26, which included most of the days for which releases were directed for the minimum basic rate or the excess-release rate of the Montague Formula.

Uncontrolled Runoff Forecasts

A comparison of the hydrographs on figures 2 and 3 of forecasted uncontrolled runoff and the actual uncontrolled runoff hydrograph indicated that the forecasting procedures were generally adequate. The forecasted uncontrolled runoff included anticipated uncontrolled runoff under then-existing conditions plus the weather adjustment based on forecasted precipitation. The total uncontrolled runoff during January 27 to March 10 (Montague dates) was 49,052 cfs-days. The forecast of uncontrolled runoff for those days was 46,528 cfs-days, or 5 percent less than actual runoff. The total uncontrolled runoff during May 29 to November 26 (Montague dates) was 133,731 cfs-days. The forecast for those days was 128,715 cfs-days, or 4 percent less than actual runoff.

Powerplant Release Forecasts

During January 27 to March 10 (Montague dates), the total actual release from the powerplants was 9,985 cfs-days. The advance estimates of powerplant releases for those days were 7,652 cfs-days, or 23 percent less than actual releases. During May 29 to November 26 (Montague dates), the total actual release from the powerplants was 54,120 cfs-days. The advance estimates of powerplant releases for those days were 46,286 cfs-days, or 14 percent less than actual releases.

Summary of Forecasts

The actual uncontrolled runoff plus actual powerplant releases during January 27 to March 10 (Montague dates) totaled 59,037 cfs-days, and the advance estimate was 54,180 cfs-days. The net cumulative difference between the estimate and the actual was 8 percent. For May 29 to November 26 (Montague dates), the actual uncontrolled runoff plus powerplant releases totaled 187,851 cfs-days, and the advance estimate was 175,001 cfs-days. The net cumulative difference between the estimated and the actual runoff was 7 percent.

On the basis of the observed discharges at Montague, exact forecasting of releases required from the City's reservoirs during January 27 to March 10, including releases for conservation purposes, as provided in the Memorandum of Agreement, would have totaled 21,548 cfs-days. The releases, as designed, totaled 22,936 cfs-days, or 6.4 percent more than for exact forecasting. Based on observed discharges at Montague, for May 29 to November 26, exact forecasting of releases would have totaled 155,405 cfs-days. Releases as designed for that period, including the computed balancing adjustments, totaled 158,258 cfs-days, or 1.8 percent more than for exact forecasting.

Summary Comparisons of River Master Operation Data and Other Streamflow Records

It has been explained that the River Master operations are, in effect, day-to-day operations, for which it is necessary to use preliminary records of streamflow. The following summaries show comparison of records used in the River Master operations and Geological Survey records. In the comparison of releases approximating conservation rates only, data were used in units of million gallons per day and converted to cubic feet per second in the summaries.

East Branch Delaware River at Downsville, N.Y.

The River Master operations data on the controlled releases from Pepacton Reservoir to the Delaware River were obtained from calibrated instruments connected to venturi meters installed in the outlet conduits.

The Geological Survey gaging station on the East Branch Delaware River at Downsville, N.Y., is 0.5 mile downstream from Pepacton Reservoir dam.

The discharge shown in table 1 includes releases and spillage from Pepacton Reservoir, a small amount of seepage, which enters the channel between the dam and gage site; and, during storms, a small amount of runoff, which originates between the dam and gage site. The drainage area at the dam is 371 square miles.

Releases were made at conservation or other rates by New York City during the year. In addition, the reservoir spilled on many days. There was good agreement, in general, between the venturi record and the Geological Survey record. For flows of approximately 54 and 72 cfs and moderate releases of 440 cfs at the gaging station, the venturi meter instruments indicated -5.9, -3.4 and +5.0 percent difference, respectively, in rates of release from the reservoir than those shown by the gaging-station records.

West Branch Delaware River at Stilesville, N.Y.

Data similar to those previously noted on releases from Pepacton Reservoir were collected for Cannonsville Reservoir.

The Geological Survey gaging station on the West Branch Delaware River at Stilesville, N.Y., is 1.4 miles downstream from Cannonsville Dam. The discharge shown in table 2 includes releases and spillage from Cannonsville Reservoir and the runoff from 2 square miles of drainage area between the dam and the gage site. The drainage area at the dam is 454 square miles, and that at the gaging station is 456 square miles.

Releases were made in a range from conservation to high rates during the year. The reservoir spilled on many days. There was fair agreement between the venturi record and the Geological Survey record. For flows of approximately 40 cfs at the gaging station, the venturi meter instruments indicated 9.1 percent less water being released from the reservoir than that shown by the gaging-station records. The venturi indicated 10 percent more discharge than that shown by the gaging-station records at flows of approximately 350 cfs. The venturi indicated 7.6 percent more discharge for flows in the 900-cfs range than the gaging-station records.

Wallenpaupack Creek at Wilsonville, Pa.

In the River Master operations December 1 to November 30, records of daily discharge through the Wallenpaupack powerplant were furnished by the Pennsylvania Power & Light Company. Daily discharges were computed on an 0800 to 0800-time basis.

The records of daily mean discharges for Wallenpaupack Creek at Wilsonville, Pa., published by the Geological Survey, were furnished by the Company. These discharges, shown in table 3, represent the flow through the turbines of the powerplant. No water was spilled from Lake Wallenpaupack during the report year.

During December 1979 through November 1980, the River Master's rec-

ord, based on computations by Pennsylvania Power & Light Company, indicated less than 0.01 percent more discharge than the Geological Survey record.

Neversink River at Neversink, N.Y.

Similar data to those previously noted on releases from Pepacton Reservoir were collected for Neversink Reservoir.

The Geological Survey gaging station on the Neversink River at Neversink, N.Y., is 1,650 ft. downstream from Neversink Dam. The discharge shown in table 4 includes releases and spillage from Neversink Reservoir and, during storms, a small amount of runoff, which originates between the dam and gage site. The drainage area at the dam is 91.8 square miles and that at the gaging station is 91.9 square miles.

Releases were made at conservation or other low rates by New York City during the year. The reservoir spilled on two days. There was very good agreement between the venturi record and the Geological Survey record.

For flows of approximately 25 and 45 cfs at the gaging station, the venturi meter instrument indicated -2.0 and +0.8 percent difference, respectively, in rates of release from the reservoir than those shown by the gaging-station records.

Delaware River at Montague, N.J.

The River Master's operation record indicated 0.3 percent more discharge for the year than the Geological Survey record, and daily records were generally in good agreement.

Diversion Tunnels

Records of diversions through the East Delaware, West Delaware, and Neversink Tunnels were furnished to the River Master's office by the City of New York. These records were obtained from calibrated instruments connected to venturi meters installed in the tunnel conduits. Current-meter measurements were made by the River Master's office to verify the accuracy of the reported diversions. The current-meter measurements were made in the outlet channels downstream from the tunnels.

East Delaware Tunnel

This tunnel discharges into Rondout Reservoir. The elevation of Rondout Reservoir was too high many months of the year to permit access to the outlet channel, which is used for measuring discharge from the tunnel by current meter. The venturi meter instruments indicated more water being diverted than indicated by the current-meter measurements. The difference December 6 showed that the venturi-meter instruments gave higher results by 8.6 percent for the totalizer and 8.0 percent for the manometer and

indicator needle. The results of three current-meter measurements made later in the year showed on the average that the venturi-meter instruments gave higher figures by 14.2 percent for the totalizer, 14.7 percent for the manometer and 14.1 percent for the indicator needle. An examination of the venturi-meter instruments by the City of New York January 19, 1981 disclosed air trapped in the instrument piping. Following a purging of the system, two current-meter measurements January 26, 1981 indicated the difference to be reduced to +8.2 percent for the totalizer, +9.4 percent for the manometer, and +8.0 percent for the indicator needle. Based upon the difference between current-meter measurements made the latter part of 1980 and those of earlier years, the indicated diversions were reduced 9 percent on a daily basis April 21, 1980 (the most feasible date) to January 19, 1981 by the City.

The powerplant that used the water diverted through the tunnel operated most days of the year. On days when the powerplant was not in operation, there was a small amount of leakage through the wicket gates, which was not recorded on the totalizer, as observed in past years. Results of a current-meter measurement September 27, 1978, indicated a rate of 16.8 cfs from cooling water and leakage.

Based upon measurements obtained this year and in previous years, the record of quantity of water diverted through the East Delaware Tunnel should be approximately correct.

West Delaware Tunnel

A comparison of four current-meter measurements with venturi measurements indicated that the venturi gave higher results by 4.8 percent for the totalizer, 6.6 percent for the manometer, and 6.0 percent for the indicator needle. Inspections of the channel downstream from the outlet, when valves were closed, showed no leakage.

Neversink Tunnel

Results of the comparative data showed that the venturi measurements and seven current-meter measurements agreed fairly well. The average difference between the two methods showed the venturi higher by 6.8 percent for the totalizer, by 7.7 percent for the manometer, and 9.5 percent for the indicator needle.

The powerplant utilizing the water diverted through the Neversink Tunnel usually operated about 12 hours daily on most days of the year. Results of one current-meter measurement made June 7, 1978, at a time when the powerplant was not operating indicated the rate of leakage to be 14.4 cfs. The leakage was not recorded on the totalizer instrument, which was used for reporting the quantity of water diverted. On the basis of that meager information, flow in the form of leakage averaged approximately 7 cfs. Two current-meter measurements August 13, while a butterfly valve was slightly open, showed a flow of 22.4 cfs.

It was concluded that the reported record of the quantity of water diverted through the Neversink Tunnel was approximately correct.

Investigation of Ungaged Streams

In an effort to delineate yields of small streams in the ungaged area tributary to the Delaware River, a cooperative program was continued with the respective Geological Survey Districts to develop discharge correlations between small streams and regularly gaged streams. The increased knowledge of the yields of these streams is an aid in the definition of characteristics of the ungaged areas.

Diversions by New Jersey

According to the terms of the Decree, the State of New Jersey may divert for use outside the Delaware River basin from the Delaware River or its tributaries in New Jersey, without compensating releases, a quantity of water not to exceed 100 mgd (154.7 cfs), as a monthly average, with the diversion on any day not to exceed 120 mgd (185.6 cfs). The diversion through the Delaware & Raritan Canal was recorded at the gaging station at Kingston, N.J. The gaging station is 6.6 miles beyond the Delaware-Raritan divide, and records include a slight amount of inflow from the Raritan River basin. Resolution No. 80-20 adopted October 17 by the Commission with the consent of parties to the Decree reduced allowable diversions by New Jersey to an average of 65 mgd (100.6 cfs). This rate was effective October 18 to November 30. A pumping station and pipeline were constructed by the State of New Jersey to divert water from Lake Hopatcong in the Delaware River basin to Rockaway River in the Passaic River basin. Diversions from Lake Hopatcong began November 18 and were reported by the State to be 25 mgd to November 30. The daily discharge in table 6, summarized in the table below, show that the Decree limitations were not exceeded during December 1, 1979 to October 17, 1980, and that the average rate of Resolution No. 80-20 was not exceeded October 18 to November 30.

Month	Average discharge, cfs	Maximum daily discharge, cfs
December	108	123
January	117	128
February	109	120
March	124	138
April	122	134
May	113	127
June	80.9	99
July	67.2	75
August	68.7	91
September	71.6	89
October 1-17	64.8	74
October 18 to November 30	75.1	-

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

With respect to diversions from the Delaware River basin to the water-supply system of the City of New York, the River Master found that diversions were less than the 800 mgd authorized. For the year June 1, 1979 to May 31, 1980, the City diverted the equivalent of 705 mgd. For June 1 to October 17, 1980, the equivalent diversion rate was 732 mgd; for October 18 to November 19 the average diversion rate was 676 mgd; during November 20-30 the average diversion rate was 546 mgd.

Under Compensating Releases of the Montague Formula, the City released water from its reservoirs at rates designed by the River Master to maintain the minimum basic rate of flow of 1,750 cfs at the gaging station at Montague, N.J., with the following four exceptions.

By a Memorandum of Agreement among the parties to the Amended Decree and approved by the River Master, the excess-release rate of the Montague Formula was temporarily suspended December 1, 1979 to May 31, 1980 to provide increased minimum flows from the reservoirs and permit evaluations of river quality, fishery, esthetics, and recreation. That procedure resulted, on some days, with releases designed to provide flows somewhat higher than 1,750 cfs at Montague. The City released water to maintain the excess-release rate of 1,880 cfs under the Montague Formula June 15 until termination of the excess quantity October 10, to maintain a rate of 1,655 cfs under Resolutions No. 80-20 October 19 to November 20, and to maintain a rate of 1,560 cfs for Resolution No. 80-24 November 21-30.

Diversions from the Delaware River basin by the State of New Jersey were found to be less than the authorized monthly average of 100 mgd and less than the authorized daily flow of 120 mgd under the Amended Decree, December 1, 1979 to October 17, 1980. Under Resolution No. 80-20, diversions were reported to be less than the authorized average of 65 mgd (100.6 cfs) October 18 to November 30.

Table 1. - Daily discharge in cubic feet per second of East Branch Delaware River at Downsville, N.Y.

for the year ending November 30, 1980

(Preliminary U.S.G.S. gaging-station record)

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	54	54	51	51	70	988	72	70	74	120	292	647
2	54	54	54	51	68	850	74	72	74	95	286	647
3	54	54	53	48	68	647	74	70	74	72	292	647
4	53	54	54	48	68	464	74	68	74	74	292	647
5	53	54	54	48	68	337	74	72	74	72	286	647
6	56	54	54	50	68	257	74	70	74	74	292	635
7	54	54	53	48	68	231	74	70	74	74	292	635
8	54	54	53	51	68	157	74	70	95	114	365	624
9	54	54	51	50	68	97	72	70	117	185	436	624
10	54	53	51	50	150	74	72	70	97	252	436	635
11	54	54	54	54	1,370	70	74	70	74	286	436	624
12	54	53	51	54	1,980	72	74	70	74	286	436	635
13	54	53	53	54	2,000	72	74	70	76	286	436	624
14	53	54	53	54	1,790	72	74	70	76	286	436	624
15	50	54	54	54	1,940	72	74	72	76	292	436	589
16	53	53	54	53	1,890	72	74	95	74	292	555	555
17	56	54	54	53	1,700	72	74	117	74	286	659	555
18	53	53	53	54	1,490	68	74	120	74	286	659	402
19	54	53	54	54	1,300	70	74	117	74	286	659	298
20	54	53	54	50	1,120	70	74	117	74	286	659	402
21	54	54	53	50	920	70	74	120	74	286	659	513
22	54	54	51	51	483	70	74	92	74	286	659	337
23	54	54	51	53	263	70	74	74	74	286	483	247
24	54	53	54	54	161	70	87	74	74	274	143	177
25	54	54	54	56	102	70	114	74	74	274	19	6.9
26	54	50	54	53	76	70	117	74	74	286	18	6.6
27	53	51	50	53	78	70	100	74	74	292	18	6.6
28	54	54	50	51	97	70	76	74	76	286	42	6.6
29	54	53	50	60	503	70	72	74	74	286	212	6.6
30	51	51		72	960	70	72	74	97	292	493	6.6
31	51	51		72		70		74	120		589	
Total cfs-days	1,662	1,652	1,529	1,654	20,987	5,582	2,334	2,498	2,458	6,852	11,975	13,009.9
Mean cfs	53.6	53.3	52.7	53.4	700	180	77.8	80.6	79.3	228	386	434

Year total 72,192.9 cfs-days

Mean 197 cfs

Table 2. - Daily discharge in cubic feet per second of West Branch Delaware River at Stilesville, N.Y.

for the year ending November 30, 1980

(Preliminary U.S.G.S. gaging-station record)

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	980	39	510	540	2,900	1,730	570	335	1,050	590	1,260	277
2	1,110	39	350	560	2,580	1,650	350	316	1,150	646	1,240	340
3	1,110	39	370	580	2,260	1,530	195	316	462	802	1,200	338
4	994	39	400	454	2,050	1,350	424	316	308	766	1,210	370
5	670	39	470	202	2,150	1,210	580	320	308	1,110	1,040	406
6	418	38	382	382	2,050	1,060	646	320	304	1,080	1,150	418
7	296	38	646	350	1,860	967	376	320	312	790	1,210	495
8	335	38	600	55	1,650	863	182	320	778	863	1,220	348
9	394	38	430	40	1,690	778	394	325	730	802	1,060	326
10	424	191	400	38	2,350	694	335	325	400	790	778	379
11	430	99	446	37	2,580	634	93	802	296	790	915	337
12	438	43	376	37	2,380	520	171	646	388	1,050	850	330
13	446	40	376	37	2,190	296	790	335	446	1,080	838	319
14	446	39	570	38	2,010	210	814	320	494	446	826	274
15	418	39	634	112	2,030	140	382	325	1,080	418	838	315
16	394	38	610	47	2,070	92	530	340	863	454	826	280
17	388	38	400	38	1,910	54	478	325	622	446	520	275
18	360	38	370	47	1,730	49	520	766	622	424	486	216
19	335	38	320	42	1,570	49	560	718	590	954	560	288
20	316	38	220	42	1,400	48	915	325	754	1,010	634	215
21	280	38	550	56	1,270	47	1,080	312	790	412	658	242
22	146	38	256	63	1,140	47	754	312	1,090	277	622	239
23	80	38	48	48	1,010	47	850	312	1,170	360	634	141
24	42	355	110	47	941	47	967	470	954	304	256	203
25	41	288	191	51	826	47	967	1,040	967	274	67	72
26	40	223	502	51	766	46	889	928	994	1,010	44	41
27	64	73	462	394	730	119	1,110	622	1,040	1,060	39	32
28	46	102	718	1,010	766	217	1,240	340	1,050	458	39	32
29	40	202	754	1,550	1,270	418	718	658	1,260	426	86	32
30	40	177		2,450	1,670	424	486	570	1,200	1,130	265	31
31	39	370		2,880		430		670	928		277	
Total cfs-days	11,560	2,892	12,471	12,278	51,799	15,813	18,366	14,349	23,400	21,022	21,648	7,611
Mean cfs	373	93.3	430	396	1,727	510	612	463	755	701	698	254

Year total 213,209 cfs-days

Mean 583 cfs

Table 3. - Daily discharge in cubic feet per second of Wallenpaupack Creek at Wilsonville, Pa.

for the year ending November 30, 1980

(Preliminary U.S.G.S. gaging-station record)

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	0	28	1,070	7	925	1,200	0	7	378	0	0	0
2	0	949	0	0	1,130	1,220	273	219	0	245	0	0
3	964	931	0	615	1,690	14	215	234	0	278	120	0
4	953	983	301	280	1,700	0	0	0	888	300	19	0
5	957	0	241	259	937	1,090	0	0	762	248	2	0
6	484	0	244	241	949	1,430	0	0	613	0	251	0
7	469	769	152	229	448	476	0	488	746	0	120	0
8	0	730	272	0	477	473	0	473	915	239	122	0
9	0	718	0	0	897	491	467	484	0	266	112	0
10	485	757	0	254	1,220	0	476	641	0	247	118	0
11	472	727	243	210	1,820	0	446	484	307	263	0	0
12	480	0	235	253	0	476	494	18	485	255	0	0
13	200	0	245	976	0	23	496	0	480	0	121	0
14	508	481	263	0	1,190	0	0	660	496	0	125	0
15	0	485	267	0	1,230	0	0	698	476	754	122	52
16	0	33	0	0	1,830	0	474	865	0	734	143	5
17	749	724	0	0	1,840	0	270	600	0	739	117	515
18	944	740	0	72	1,830	0	255	461	234	743	0	244
19	937	0	252	0	4	268	268	0	125	729	0	227
20	944	0	449	0	0	0	236	12	257	0	0	252
21	950	473	235	23	1,000	0	0	896	226	0	0	283
22	0	482	260	0	927	26	0	479	258	780	0	0
23	0	534	0	0	933	49	477	489	0	707	0	0
24	0	467	0	465	951	0	199	476	0	712	0	287
25	0	492	260	735	944	0	237	471	245	756	0	383
26	913	0	251	728	0	0	244	0	246	733	0	232
27	948	0	432	742	0	235	233	0	244	0	0	228
28	931	228	245	781	939	0	0	202	237	0	0	219
29	0	231	543	0	1,190	0	0	256	235	744	0	0
30	0	484		0	1,210	0	155	242	0	740	0	0
31	951	245		880		0		248	16		0	
Total cfs-days	14,239	12,691	6,460	7,750	28,211	7,471	5,915	10,103	8,869	11,212	1,492	2,927
Mean cfs	459	409	223	250	940	241	197	326	286	374	48.1	97.6

Year total 117,340 cfs-days Mean 321 cfs

Table 4. - Daily discharge in cubic feet per second of Neversink River at Neversink, N.Y.

for the year ending November 30, 1980

(Preliminary U.S.G.S. gaging-station record)

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	30	27	27	28	46	45	45	47	46	74	46	25
2	27	28	27	28	46	45	46	47	47	64	46	24
3	29	25	27	27	46	45	47	46	46	47	46	24
4	28	23	27	26	45	45	46	46	46	47	46	24
5	28	24	26	27	44	46	45	47	46	46	46	25
6	28	24	26	27	47	46	44	46	46	45	45	25
7	28	24	26	25	40	45	44	46	46	45	45	25
8	27	26	26	25	46	45	43	46	57	45	45	25
9	28	27	26	25	46	46	45	46	74	46	44	25
10	28	27	26	26	46	47	44	46	64	46	45	24
11	28	27	26	25	45	47	44	46	44	45	45	23
12	30	29	26	25	46	47	44	46	47	45	45	24
13	28	29	26	25	49	47	43	46	47	45	44	25
14	27	26	26	26	44	47	43	46	47	45	44	25
15	27	26	26	26	82	46	43	46	48	46	43	24
16	26	26	26	27	213	45	43	46	47	46	43	24
17	23	26	25	26	58	45	44	56	47	46	43	26
18	27	26	25	25	45	44	43	73	47	45	44	26
19	27	23	25	25	45	44	44	73	46	46	44	25
20	27	23	26	26	46	44	44	73	46	46	43	26
21	27	26	25	30	46	45	43	73	46	46	43	26
22	27	25	24	29	46	44	44	59	46	47	44	26
23	27	25	24	29	46	45	43	46	46	48	45	25
24	27	26	25	27	46	45	52	46	46	47	30	16
25	27	26	25	27	46	44	72	46	46	46	17	5.4
26	26	25	25	26	46	44	72	46	46	45	16	5.3
27	25	24	25	27	46	44	61	46	47	45	16	5.4
28	23	25	27	27	46	44	43	46	48	44	16	5.5
29	26	25	27	27	46	44	46	47	47	43	24	5.4
30	26	25		34	46	45	46	47	56	44	39	5.3
31	27	27		46		45		47	73		26	
Total cfs-days	839	795	748	849	1,585	1,400	1,406	1,563	1,531	1,415	1,208	619.3
Mean cfs	27.1	25.6	25.8	27.4	52.8	45.2	46.9	50.4	49.4	47.2	39.0	20.6

Year total 13,958.3 cfs-days Mean 38.1 cfs

Table 5. - Daily discharge in cubic feet per second of the Delaware River at Montague, N.J.

for the year ending November 30, 1980

(Preliminary U.S.G.S. gaging-station record)

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	8,740	4,370	1,550	2,400	17,400	14,800	1,740	3,800	1,800	1,990	1,880	1,520
2	7,320	3,330	2,300	1,650	16,700	12,700	1,730	3,010	2,060	1,800	1,790	1,580
3	6,930	4,070	1,500	1,600	15,200	11,000	2,230	2,610	2,150	1,860	1,860	1,810
4	7,230	3,640	1,750	2,300	14,600	8,840	2,210	2,280	2,460	1,720	2,170	1,670
5	6,810	3,400	2,000	1,900	16,100	7,840	1,740	1,660	2,930	1,900	1,850	1,630
6	6,370	2,200	1,850	1,800	13,900	8,620	1,870	1,750	2,980	1,740	1,840	1,590
7	5,420	2,100	1,900	1,700	12,000	7,140	2,080	2,010	2,640	1,980	1,920	1,590
8	4,700	3,100	1,750	1,800	10,400	6,230	2,210	2,620	2,560	1,720	1,950	1,690
9	3,760	3,000	1,950	3,100	11,100	5,370	1,850	2,360	2,480	1,650	1,970	1,730
10	3,680	3,000	1,700	4,000	23,200	4,690	2,260	2,250	1,640	1,680	1,890	1,680
11	4,320	2,900	1,600	3,700	23,200	3,920	2,530	2,310	1,640	1,640	2,070	1,770
12	4,240	3,100	1,750	2,900	17,600	4,340	2,260	2,090	1,870	1,760	1,780	1,790
13	4,170	3,020	1,750	2,500	14,800	4,970	1,890	1,990	1,860	1,930	1,750	1,700
14	4,300	3,010	1,600	3,000	14,100	4,360	1,680	1,620	1,780	1,820	1,810	1,630
15	4,190	3,100	1,650	1,850	17,500	4,310	1,710	2,180	1,990	1,720	1,780	1,580
16	3,260	3,000	1,950	1,600	18,400	3,650	1,660	2,190	1,990	1,940	1,770	1,600
17	3,110	2,700	1,700	1,850	15,500	3,090	2,030	2,340	1,790	1,900	1,780	1,610
18	3,800	3,300	1,700	4,900	13,500	2,700	1,980	2,100	1,490	2,150	1,840	2,140
19	4,100	2,990	1,600	13,200	11,200	2,770	1,880	1,860	1,700	2,120	1,630	1,860
20	3,400	2,190	1,800	10,100	9,460	3,090	1,920	1,540	1,370	2,120	1,520	1,770
21	3,400	1,890	2,000	12,600	8,840	2,890	1,820	1,560	1,490	1,790	1,580	1,630
22	3,600	2,270	1,650	58,400	8,490	2,750	2,030	2,580	1,550	1,730	1,650	1,670
23	2,780	2,670	2,100	30,500	7,290	2,570	1,810	2,170	1,660	2,040	1,610	1,480
24	2,700	2,550	1,750	20,000	6,780	2,320	1,910	2,230	1,660	1,720	1,580	1,630
25	3,590	2,500	1,350	18,100	6,240	1,990	1,830	2,070	1,650	1,720	1,770	4,370
26	7,510	2,400	1,450	16,500	5,400	1,800	1,920	2,040	1,890	1,840	2,370	7,210
27	7,090	2,000	1,450	13,300	4,120	1,620	1,840	1,790	1,990	1,770	2,480	5,100
28	5,970	2,000	1,900	12,100	5,890	1,700	1,840	1,600	1,980	1,690	2,240	3,850
29	5,210	1,950	1,700	13,000	14,400	1,410	1,910	1,570	2,000	1,610	1,560	3,520
30	4,090	1,600		17,700	17,300	1,480	2,930	1,490	1,960	1,950	1,240	3,420
31	3,940	1,850		17,800		1,660		1,950	2,020		1,220	
Total cfs-days	149,730	85,200	50,700	297,850	390,610	146,620	59,300	65,620	61,030	55,000	56,150	67,820
Mean cfs	4,830	2,748	1,748	9,608	13,020	4,730	1,977	2,117	1,969	1,833	1,811	2,261

Year total 1,485,630 cfs-days

Mean 4,059 cfs

Table 6. - Daily discharge in cubic feet per second of Delaware & Raritan Canal at Kingston, N.J.

for the year ending November 30, 1980

(Preliminary U.S.G.S. gaging-station record)

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	80	110	109	120	134	123	98	75	55	62	52	75
2	75	111	104	116	129	125	99	74	78	62	59	81
3	91	111	102	111	122	125	96	73	62	61	64	80
4	100	112	102	114	131	125	96	69	61	60	66	80
5	100	113	101	116	132	125	88	70	74	60	66	82
6	101	114	102	116	125	124	87	71	91	62	64	91
7	103	114	103	116	121	123	87	69	78	63	61	96
8	103	114	102	117	91	124	81	67	76	59	64	93
9	103	113	103	120	117	124	81	66	74	55	64	92
10	102	113	104	121	126	123	81	62	72	58	64	93
11	110	114	105	124	122	121	81	63	70	57	65	94
12	123	127	107	124	122	121	81	62	74	59	66	86
13	116	128	107	123	117	127	81	61	78	59	66	87
14	115	122	108	122	114	125	81	60	74	61	65	86
15	115	117	108	120	109	123	81	57	69	71	68	78
16	115	117	109	124	110	121	81	62	68	75	73	80
17	115	117	111	127	125	121	81	74	66	74	74	74
18	113	118	111	133	123	91	80	75	64	79	72	65
19	111	122	112	128	123	54	75	69	66	81	80	63
20	107	123	111	128	123	114	77	70	69	84	81	62
21	113	123	111	132	125	120	76	74	71	82	79	62
22	112	122	110	138	125	118	74	73	68	86	77	62
23	114	123	115	122	125	109	74	72	62	84	78	62
24	116	122	117	125	125	110	72	67	61	82	78	63
25	117	120	118	134	125	109	70	67	61	83	82	66
26	118	119	119	132	125	108	69	67	65	89	84	63
27	118	118	119	128	124	106	69	66	65	89	79	55
28	116	117	119	122	126	92	74	64	66	89	76	56
29	114	115	120	123	128	78	77	67	65	88	71	56
30	113	115		128	122	91	78	68	64	73	67	55
31	111	113		134		95		50	63		62	
Total cfs-days	3,360	3,637	3,169	3,838	3,666	3,495	2,426	2,084	2,130	2,147	2,167	2,238
Mean cfs	108	117	109	124	122	113	80.9	67.2	68.7	71.6	69.9	74.6

Year total 34,357 cfs-days

Mean 93.9 cfs

Table 7. - Daily discharge in cubic feet per second of Delaware River at Trenton, N.J.

for the year ending November 30, 1980

(Preliminary U.S.G.S. gaging-station record)

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	20,200	9,930	4,510	3,900	39,400	32,900	5,070	4,550	3,030	3,050	2,770	3,450
2	17,200	10,100	4,000	3,460	37,100	27,600	5,930	5,430	3,230	3,100	3,130	3,320
3	15,100	8,880	3,900	4,090	33,500	23,500	5,650	5,710	3,340	3,040	3,210	3,090
4	13,800	9,030	4,000	3,370	32,700	19,900	7,300	4,930	3,660	2,970	3,480	3,000
5	13,700	8,640	4,800	3,760	32,400	16,800	7,270	4,570	4,210	2,930	3,520	3,180
6	12,800	7,970	4,200	4,310	30,200	14,800	6,070	4,450	4,470	2,830	3,570	3,020
7	12,900	6,870	4,400	3,950	25,600	14,900	5,390	5,030	4,350	3,040	3,280	2,970
8	11,700	6,160	4,500	3,860	21,500	13,600	5,520	4,490	4,070	2,830	3,090	2,860
9	10,600	6,500	4,400	4,630	22,700	12,400	5,570	4,570	3,810	2,970	2,930	2,810
10	9,210	6,520	4,330	5,340	34,900	11,300	5,810	4,500	3,630	2,800	2,950	2,960
11	8,550	6,360	4,270	7,110	47,800	10,600	5,780	4,200	3,490	2,740	3,080	2,950
12	8,700	10,900	3,980	7,490	40,600	9,930	5,620	4,140	2,950	2,690	2,990	2,850
13	8,870	11,200	3,970	6,240	31,900	14,800	5,560	4,310	2,950	2,660	2,940	2,900
14	10,500	8,880	3,760	6,230	28,200	14,300	5,020	3,800	3,130	2,840	2,690	2,900
15	10,100	8,520	3,830	5,340	30,600	12,000	4,590	3,710	3,070	3,220	2,630	2,770
16	9,510	8,600	3,970	6,330	34,800	10,900	4,310	3,460	3,050	3,070	2,760	2,650
17	8,810	8,270	4,000	5,940	33,000	9,730	4,270	3,840	3,140	2,870	2,790	2,570
18	8,240	7,580	3,650	14,100	28,300	8,810	4,240	3,780	3,080	3,730	3,030	2,840
19	8,130	9,160	3,480	23,200	23,900	8,300	4,320	3,710	2,910	3,660	3,180	3,220
20	7,960	8,540	3,670	27,500	20,200	8,180	4,170	3,500	2,730	3,480	3,140	3,530
21	7,700	7,400	3,780	29,500	17,600	8,680	4,080	3,200	2,820	3,280	2,850	3,160
22	7,580	6,770	4,300	69,800	16,100	9,440	4,030	3,100	2,500	3,150	2,670	3,020
23	8,120	6,420	4,850	88,700	15,300	8,660	4,000	3,260	2,560	2,800	2,780	2,860
24	7,920	6,520	4,990	52,000	13,800	7,780	4,060	4,350	2,650	2,720	2,870	3,130
25	9,410	6,240	5,380	46,800	12,800	7,110	3,900	3,930	2,640	3,070	4,740	6,260
26	14,300	5,580	4,720	40,600	11,800	6,550	3,730	3,660	2,650	2,840	8,660	7,690
27	17,000	5,630	4,140	34,100	11,300	5,900	3,650	3,380	2,770	2,770	6,220	10,500
28	15,600	5,260	3,670	26,500	13,400	5,530	3,680	3,220	3,080	2,850	4,970	8,960
29	13,600	5,390	3,640	25,700	23,100	5,160	3,590	3,150	3,140	2,800	4,550	7,510
30	12,100	4,950		29,200	33,800	4,840	4,040	3,130	3,000	2,640	3,940	6,650
31	10,700	4,720		35,700		4,620		3,200	3,020		3,460	
Total cfs-days	350,610	233,490	121,090	628,750	798,300	369,520	146,220	124,260	99,130	89,440	108,870	119,580
Mean cfs	11,310	7,532	4,176	20,280	26,610	11,920	4,874	4,008	3,198	2,981	3,512	3,986

Year total 3,189,260 cfs-days

Mean 8,714 cfs

Table 8. - 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 cubic feet per second for 24 hours

Controlled releases from New York City reservoirs					Lake Wallenpaupack		Mongaup Reservoir		Delaware River at Montague							
									Segregation of flow						Excess release credits	
Directed		Pepacton	Cannonsville	Neversink	Date	Controlled release	Date	Controlled release	Date	Controlled releases N.Y.C. reservoirs		Power-plants	Computed uncontrolled	Total		
Date	Amount									Directed	Other				Daily	Cumulative
1979	1	2	3	4		5		6		7	8	9	10	11	12	13
Nov. 28	108	51	34	26	Nov. 30	928	Dec. 1	340	Dec. 1	111	0	1,268	7,431	8,810	66	12,642
29	108	51	34	29	Dec. 1	0	2	129	2	114	0	129	7,137	7,380	69	12,711
30	108	51	34	25	2	0	3	449	3	110	0	449	6,371	6,930	65	12,776
Dec. 1	108	51	34	28	3	964	4	501	4	113	0	1,465	5,622	7,200	68	12,844
2	108	50	34	26	4	955	5	503	5	110	0	1,458	5,212	6,780	65	12,909
3	108	50	34	25	5	959	6	481	6	109	0	1,440	4,731	6,280	64	12,973
4	108	50	34	25	6	481	7	486	7	109	0	967	4,244	5,320	64	13,037
5	108	51	34	25	7	469	8	0	8	110	0	469	4,051	4,630	65	13,102
6	108	50	34	25	8	0	9	0	9	109	0	0	3,611	3,720	64	13,166
7	108	50	34	26	9	7	10	378	10	110	0	385	3,085	3,580	65	13,231
8	108	50	34	25	10	485	11	513	11	109	0	998	3,143	4,250	64	13,295
9	108	51	34	25	11	466	12	415	12	110	0	881	3,149	4,140	65	13,360
10	108	50	34	26	12	485	13	490	13	110	0	975	3,015	4,100	65	13,425
11	108	51	34	26	13	200	14	508	14	111	0	708	3,391	4,210	66	13,491
12	108	51	34	26	14	503	15	459	15	111	0	962	3,087	4,160	66	13,557
13	108	50	34	26	15	0	16	0	16	110	0	0	3,120	3,230	65	13,622
14	108	50	34	25	16	0	17	232	17	109	0	232	2,759	3,100	64	13,686
15	108	51	34	23	17	754	18	281	18	108	0	1,035	2,657	3,800	63	13,749
16	108	50	34	26	18	939	19	469	19	110	0	1,408	2,582	4,100	65	13,814
17	108	50	34	25	19	937	20	319	20	109	0	1,256	2,035	3,400	64	13,878
18	108	50	34	25	20	947	21	168	21	109	0	1,115	2,176	3,400	64	13,942
19	108	50	34	25	21	946	22	119	22	109	0	1,065	2,426	3,600	64	14,006
20	108	50	34	25	22	0	23	0	23	109	0	0	2,661	2,770	64	14,070
21	108	50	34	25	23	0	24	0	24	109	0	0	2,501	2,610	64	14,134
22	108	50	34	25	24	0	25	0	25	109	0	0	3,391	3,500	87	14,221
23	108	50	34	25	25	0	26	0	26	109	0	0	7,311	7,420	90	14,311
24	108	50	34	26	26	913	27	0	27	110	0	913	6,027	7,050	91	14,402
25	108	54	34	26	27	948	28	0	28	114	0	948	4,958	6,020	95	14,497
26	108	50	65	25	28	931	29	0	29	109	31	931	4,069	5,140	121	14,618
27	108	50	34	26	29	0	30	0	30	110	0	0	3,980	4,090	91	14,709
28	108	50	34	26	30	2	31	0	31	110	0	2	3,788	3,900	91	14,800
Total	3,348	1,563	1,085	792		14,219		7,240		3,409	31	21,459	123,721	148,620	2,224	

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 ending 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4 (except Dec. 29 and total).
Col. 8 = Releases by New York City for valve exercise or other purpose.
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 - Computed as described under Definitions of Terms and Procedures.
Col. 13 - Seasonal limit of cumulative credit beginning June 1, 1979 = 26,919 cfs-days.

Table 8. - 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 cubic feet per second for 24 hours

Controlled releases from New York City reservoirs					Lake Wallenpaupack		Mongaup Reservoir		Delaware River at Montague							
									Segregation of flow						Excess release credits	
Directed		Pepacton	Cannonsville	Neversink	Date	Controlled release	Date	Controlled release	Date	Controlled releases N.Y.C. reservoirs		Power-plants	Computed uncontrolled	Total		
Date	Amount									Directed	Other				Daily	Cumulative
1979/80	1	2	3	4		5		6		7	8	9	10	11	12	13
Dec. 29	108	50	34	26	Dec. 31	944	Jan. 1	0	Jan. 1	110	0	944	3,236	4,290	91	14,891
30	108	50	34	26	Jan. 1	31	2	253	2	110	0	284	2,836	3,230	91	14,982
31	108	50	34	26	2	949	3	324	3	110	0	1,273	2,657	4,040	91	15,073
Jan. 1	108	50	34	26	3	926	4	248	4	110	0	1,174	2,376	3,660	91	15,164
2	108	50	34	23	4	979	5	0	5	107	0	979	2,314	3,400	88	15,252
3	108	50	34	23	5	0	6	0	6	107	0	0	2,093	2,200	88	15,340
4	108	50	34	23	6	0	7	238	7	107	0	238	1,755	2,100	88	15,428
5	108	50	34	23	7	769	8	324	8	107	0	1,093	1,900	3,100	88	15,516
6	108	50	34	25	8	730	9	195	9	109	0	925	1,966	3,000	90	15,606
7	108	50	34	26	9	718	10	0	10	110	0	718	2,172	3,000	91	15,697
8	108	50	34	26	10	757	11	0	11	110	0	757	2,033	2,900	91	15,788
					11	727	12	0	12			727	2,373	3,100		
9	354	50	280	26	12	0	13	0	13	356	0	0	2,724	3,080	2	15,790
10	108	50	34	28	13	2	14	86	14	112	0	88	2,860	3,060	93	15,883
11	108	50	34	29	14	481	15	0	15	113	0	481	2,506	3,100	94	15,977
12	108	50	34	26	15	485	16	194	16	110	0	679	2,111	2,900	91	16,068
13	108	50	34	25	16	36	17	194	17	109	0	230	2,361	2,700	90	16,158
14	108	50	34	26	17	722	18	0	18	110	0	722	2,428	3,260	91	16,249
15	108	51	34	25	18	739	19	0	19	110	0	739	2,111	2,960	91	16,340
16	108	50	34	26	19	0	20	0	20	110	0	0	2,080	2,190	91	16,431
17	108	50	34	25	20	3	21	0	21	109	0	3	1,768	1,880	90	16,521
18	108	50	34	23	21	469	22	292	22	107	0	761	1,372	2,240	88	16,609
19	108	50	34	25	22	482	23	319	23	109	0	801	1,720	2,630	90	16,699
20	108	50	34	26	23	534	24	302	24	110	0	836	1,574	2,520	91	16,790
21	108	50	34	26	24	467	25	297	25	110	0	764	1,626	2,500	91	16,881
22	108	50	34	26	25	492	26	0	26	110	0	492	1,798	2,400	91	16,972
23	550	50	469	28	26	0	27	0	27	547	0	0	1,453	2,000	-3	16,969
24	400	50	325	25	27	0	28	0	28	400	0	0	1,600	2,000	0	16,969
25	282	50	207	23	28	230	29	0	29	280	0	230	1,440	1,950	-2	16,967
26	132	50	57	25	29	272	30	0	30	132	0	272	1,196	1,600	0	16,967
27	222	50	153	25	30	444	31	0	31	228	0	444	1,178	1,850	6	16,973
Total	4,532	1,501	2,307	761		13,388		3,266		4,569	0	16,654	63,617	84,840	2,173	

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 ending 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4.
Col. 8 - Releases by New York City for valve exercise or other purpose.
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 - Computed as described under Definitions of Terms and Procedures.
Col.13 - Seasonal limit of cumulative credit beginning June 1, 1979 = 26,919 cfs-days.

Note: Computational time of transit from New York City Reservoirs to Montague was increased 24 hours beginning January 13 (Montague date); some data adjusted to preserve budget balance.

Table 8. - 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 cubic feet per second for 24 hours

Controlled releases from New York City reservoirs					Lake Wallenpaupack		Mongaup Reservoir		Delaware River at Montague							
									Segregation of flow						Excess release credits	
Directed		Pepacton	Cannonsville	Neversink	Date	Controlled release	Date	Controlled release	Date	Controlled releases			Computed uncontrolled	Total		
										N.Y.C. reservoirs		Powerplants			Daily	Cumulative
Date	Amount									Directed	Other					
1980	1	2	3	4		5		6		7	8	9	10	11	12	13
Jan.28	312	50	238	25	Jan.31	347	Feb. 1	0	Feb. 1	313	0	347	890	1,550	1	16,974
29	222	51	149	26	Feb. 1	969	2	0	2	226	0	969	1,105	2,300	4	16,978
30	570	50	489	26	2	0	3	0	3	565	0	0	935	1,500	-5	16,973
31	660	50	589	26	3	0	4	0	4	665	0	0	1,085	1,750	5	16,978
Feb. 1	462	50	394	26	4	301	5	0	5	470	0	301	1,229	2,000	8	16,986
2	512	50	438	26	5	241	6	0	6	514	0	241	1,095	1,850	2	16,988
3	542	50	464	26	6	244	7	0	7	540	0	244	1,116	1,900	-2	16,986
4	612	51	535	25	7	173	8	0	8	611	0	173	966	1,750	-1	16,985
5	522	50	446	25	8	251	9	0	9	521	0	251	1,178	1,950	-1	16,984
6	800	50	724	26	9	0	10	0	10	800	0	0	900	1,700	0	16,984
7	750	50	676	26	10	15	11	0	11	752	0	15	833	1,600	2	16,986
8	572	50	497	26	11	231	12	0	12	573	0	231	896	1,700	1	16,987
9	542	50	464	26	12	232	13	0	13	540	0	232	978	1,750	-2	16,985
10	592	50	517	26	13	245	14	0	14	593	0	245	762	1,600	1	16,986
11	512	50	436	26	14	263	15	0	15	512	0	263	875	1,650	0	16,986
12	512	51	438	26	15	267	16	173	16	515	0	440	945	1,900	3	16,989
13	730	50	659	26	16	0	17	0	17	735	0	0	865	1,600	5	16,994
14	790	50	716	26	17	0	18	0	18	792	0	0	808	1,600	2	16,996
15	760	51	688	25	18	0			19	764	0	0	836	1,600	4	17,000
16	537	50	459	25	19	257	19	0	20	534	0	257	1,009	1,800	-3	16,997
17	497	50	422	25	20	444	20	0	21	497	0	444	1,059	2,000	0	16,997
18	442	50	370	26	21	235	21	0	22	446	0	235	969	1,650	4	17,001
19	322	50	251	26	22	260	22	216	23	327	0	476	1,297	2,100	5	17,006
20	700	50	633	25	23	0	23	0	24	708	0	0	992	1,700	8	17,014
21	298	50	223	25	24	7	24	0	25	298	0	7	1,045	1,350	0	17,014
22	108	50	34	25	25	254	25	0	26	109	0	254	1,137	1,500	90	17,104
23	192	50	119	25	26	253	26	0	27	194	0	253	1,003	1,450	2	17,106
24	342	51	271	25	27	430	27	0	28	347	0	430	1,123	1,900	5	17,111
25	652	50	583	25	28	245	28	0	29	658	0	245	797	1,700	6	17,117
Total	15,064	1,455	12,922	742		6,164		389		15,119	0	6,553	28,728	50,400	144	

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 ending 1600 of date shown Feb. 1-18; 24 hours of calendar day shown Feb. 19-28.
Col. 7 - Col. 2 + Col. 3 + Col. 4.
Col. 8 - Releases by New York City for valve exercise or other purpose.
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 - Computed as described under Definitions of Terms and Procedures.
Col. 13 - Seasonal limit of cumulative credit beginning June 1, 1979 = 26,919 cfs-days.

Table 8. - 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 cubic feet per second for 24 hours

Controlled releases from New York City reservoirs					Lake Wallenpaupack		Mongaup Reservoir		Delaware River at Montague							
									Segregation of flow						Excess release credits	
Directed		Pepacton	Cannonsville	Neversink	Date	Controlled release	Date	Controlled release	Date	Controlled releases N.Y.C. reservoirs		Power-plants	Computed uncontrolled	Total	Daily	Cumulative
Date	Amount									Directed	Other					
1980	1	2	3	4		5		6		7	8	9	10	11	12	13
Feb. 26	602	50	531	25	Feb.29	543	Feb.29	301	Mar. 1	606	0	844	950	2,400	4	17,121
27	870	50	789	26	Mar. 1	7	Mar. 1	0	2	865	0	7	778	1,650	-5	17,116
28	900	50	828	28	2	62	2	0	3	906	0	62	632	1,600	6	17,122
29	682	50	611	28	3	585	3	0	4	689	0	585	1,026	2,300	7	17,129
Mar. 1	712	51	636	28	4	248	4	0	5	715	0	248	937	1,900	3	17,132
2	722	50	650	25	5	263	5	0	6	725	0	263	812	1,800	3	17,135
3	582	50	506	26	6	238	6	0	7	582	0	238	880	1,700	0	17,135
4	242	50	169	26	7	229	7	0	8	245	0	229	1,326	1,800	3	17,138
5	570	50	495	25	8	0	8	0	9	570	0	0	2,530	3,100	0	17,138
6	404	50	331	23	9	10	9	0	10	404	0	10	3,586	4,000	0	17,138
7	108	50	34	25	10	264	10	0	11	109	0	264	3,327	3,700	48	17,186
8	108	50	34	25	11	190	11	0	12	109	0	190	2,601	2,900	9	17,195
9	108	50	34	26	12	283	12	259	13	110	0	542	1,848	2,500	91	17,286
10	108	51	34	25	13	946	13	221	14	110	0	1,167	1,723	3,000	91	17,377
11	108	50	34	25	14	0	14	307	15	109	0	307	1,434	1,850	90	17,467
12	108	51	34	25	15	0	15	0	16	110	0	0	1,490	1,600	91	17,558
13	108	50	34	26	16	0	16	0	17	110	0	0	1,740	1,850	91	17,649
14	200	50	127	26	17	0	17	341	18	203	0	341	4,356	4,900	3	17,652
15	108	51	34	26	18	72	18,19	486	19	111	0	558	12,731	13,400	92	17,744
16	108	50	34	23	19	0	20	227	20	107	0	227	9,866	10,200	88	17,832
17,18	216	100	68	46	20	0	21	211	21	214	0	211	12,175	12,600	176	18,008
19	108	50	34	26	21	23	22	508	22	110	0	531	57,859	58,500	91	18,099
20	108	50	34	28	22	0	23	529	23	112	0	529	29,659	30,300	93	18,192
21	108	51	36	28	23	3	24	557	24	115	0	560	19,425	20,100	96	18,288
22	108	50	36	28	24	463	25	513	25	114	0	976	17,010	18,100	95	18,383
23	108	50	36	26	25	734	26	508	26	112	0	1,242	15,346	16,700	93	18,476
24	108	51	36	26	26	733	27	518	27	113	0	1,251	12,436	13,800	94	18,570
25	108	50	36	26	27	776	28	523	28	112	0	1,299	10,789	12,200	65	18,635
26	108	50	37	26	28	741	29	518	29	113	0	1,259	11,928	13,300	65	18,700
27	108	50	37	26	29	0	30	508	30	113	0	508	17,079	17,700	65	18,765
28	108	50	37	26	30	0	31	513	31	113	0	513	17,274	17,900	65	18,830
Total	8,754	1,606	6,406	824		7,413		7,548		8,836	0	14,961	275,553	299,350	1,713	

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 of calendar day shown March 1-18;
24 hours ending 1600 of date shown March 19-31.
Col. 7 = Col. 2 + Col. 3 + Col. 4.
Col. 8 - Releases by New York City for valve exercise or other purpose.

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 - Computed as described under Definitions of Terms and Procedures.
Col. 13 - Seasonal limit of cumulative credit beginning June 1, 1979 = 26,919 cfs-days.

Computational time of transit from New York City reservoirs to Montague was decreased 24 hours on March 21 (Montague date); some data adjusted to preserve budget balance.

Table 8. - 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 cubic feet per second for 24 hours

Controlled releases from New York City reservoirs					Lake Wallenpaupack		Mongaup Reservoir		Delaware River at Montague								
									Segregation of flow							Excess release credits	
Directed		Pepacton	Cannonsville	Neversink	Date	Controlled release	Date	Controlled release	Date	Controlled releases N.Y.C. reservoirs		Power-plants	Computed uncontrolled	Total			
Date	Amount									Directed	Other					Daily	Cumulative
1980	1	2	3	4		5		6		7	8	9	10	11		12	13
Mar. 29	160	71	45	48	Mar. 31	880	Apr. 1	523	Apr. 1	164	0	1,403	15,833	17,400		108	18,938
30	160	71	45	48	Apr. 1	925	2	508	2	164	0	1,433	15,203	16,800		108	19,046
31	160	70	45	48	2	1,620	3	514	3	163	0	2,134	13,203	15,500		107	19,153
Apr. 1	160	70	45	48	3	1,700	4	508	4	163	0	2,208	12,429	14,800		107	19,260
2	160	70	45	46	4	1,211	5	502	5	161	0	1,713	14,326	16,200		105	19,365
3	160	70	45	46	5	933	6	497	6	161	0	1,430	12,509	14,100		105	19,470
4	160	70	45	48	6	953	7	481	7	163	0	1,434	10,503	12,100		107	19,577
5	160	70	45	42	7	445	8	530	8	157	0	975	9,368	10,500		101	19,678
6	160	70	45	46	8	477	9	454	9	161	0	931	10,108	11,200		105	19,783
7	160	70	45	46	9	900	10	514	10	161	0	1,414	21,525	23,100		95	19,878
8	160	70	45	46	10	1,820	11	497	11	161	0	2,317	20,722	23,200		82	19,960
9	160	70	45	46	11	1,208	12	486	12	161	0	1,694	15,945	17,800		82	20,042
10	160	70	45	46	12	0	13	502	13	161	0	502	14,537	15,200		31	20,073
11	160	71	45	46	13	0	14	481	14	162	0	481	13,757	14,400		31	20,104
12	160	70	45	45	14	1,204	15	497	15	160	0	1,701	15,839	17,700		30	20,134
13	160	70	45	45	15	1,824	16	481	16	160	0	2,305	16,235	18,700		30	20,164
14	160	70	45	45	16	1,829	17	497	17	160	0	2,326	13,514	16,000		0	20,164
15	160	70	45	45	17	1,839	18	497	18	160	0	2,336	11,504	14,000		0	20,164
16	160	70	45	45	18	1,221	19	486	19	160	0	1,707	9,533	11,400		30	20,194
17	160	70	45	45	19	0	20	464	20	160	0	464	8,936	9,560		30	20,224
18	160	70	45	46	20	77	21	497	21	161	0	574	8,145	8,880		31	20,255
19	160	70	45	46	21	934	22	341	22	161	0	1,275	7,054	8,490		31	20,286
20	160	70	45	46	22	921	23	346	23	161	0	1,267	5,892	7,320		31	20,317
21	160	73	45	46	23	935	24	519	24	164	0	1,454	5,222	6,840		31	20,348
22	160	70	45	46	24	962	25	454	25	161	0	1,416	4,733	6,310		31	20,379
23	160	70	70	46	25	944	26	0	26	161	25	944	4,280	5,410		31	20,410
24	160	71	45	46	26	0	27	0	27	162	0	0	4,028	4,190		31	20,441
25	160	77	45	47	27	3	28	329	28	162	7	332	5,089	5,590		43	20,484
26	160	73	45	46	28	939	29	415	29	164	0	1,354	12,882	14,400		77	20,561
27	160	71	45	46	29	1,186	30	491	30	162	0	1,677	15,761	17,600		83	20,644
Total	4,800	2,118	1,375	1,381		27,890		13,311		4,842	32	41,201	348,615	394,690		1,814	

Col. 2 - 24 hours beginning 1200 of date shown, except 23 hours Apr. 26.
Col. 3 - 24 hours ending 2400 one day later, except 23 hours Apr. 26.
Col. 4 - 24 hours beginning 1500 one day later, except 23 hours Apr. 25.
Col. 5 - 24 hours beginning 0800 of date shown, except 23 hours Apr. 26.
Col. 6 - 24 hours ending 1600 of date shown, except 23 hours Apr. 27.
Col. 7 = Col. 2 + Col. 3 + Col. 4 (except Apr. 26, 28 and total).
Col. 8 - Releases by New York City for valve exercise or other purpose.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 - 24 hours of calendar day shown, except 23 hours Apr. 27
Col. 12 - Computed as described under Definitions of Terms and Procedures.
Col. 13 - Seasonal limit of cumulative credit beginning June 1, 1979 = 26,919 cfs-days.

Table 8. - 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 cubic feet per second for 24 hours

Controlled releases from New York City reservoirs					Lake Wallenpaupack		Mongaup Reservoir		Delaware River at Montague							
									Segregation of flow						Excess release credits	
Directed		Pepacton	Cannonsville	Neversink	Date	Controlled release	Date	Controlled release	Date	Controlled releases N.Y.C. reservoirs		Power-plants	Computed uncontrolled	Total		
Date	Amount									Directed	Other				Daily	Cumulative
1980	1	2	3	4		5		6		7	8	9	10	11	12	13
Apr. 28	160	71	45	46	Apr. 30	1,207	May 1	508	May 1	162	0	1,715	13,523	15,400	31	20,675
29	160	71	45	46	May 1	1,200	2	497	2	162	0	1,697	11,341	13,200	31	20,706
30	160	70	45	45	2	1,233	3	491	3	160	0	1,724	9,416	11,300	30	20,736
May 1	160	70	45	46	3	0	4	0	4	161	0	0	8,879	9,040	31	20,767
2	160	70	45	46	4	7	5	361	5	161	0	368	7,281	7,810	31	20,798
3	160	70	45	48	5	1,690	6	491	6	163	0	2,181	6,246	8,590	33	20,831
4	160	70	45	48	6	822	7	464	7	163	0	1,286	5,661	7,110	33	20,864
5	160	70	45	46	7	476	8	367	8	161	0	843	5,196	6,200	31	20,895
6	160	70	45	45	8	473	9	286	9	160	0	759	4,431	5,350	30	20,925
7	160	70	45	46	9	491	10	0	10	161	0	491	4,078	4,730	31	20,956
8	160	70	45	46	10	0	11	0	11	161	0	0	3,739	3,900	31	20,987
9	160	70	45	46	11	10	12	319	12	161	0	329	3,780	4,270	63	21,050
10	160	70	45	46	12	466	13	307	13	161	0	773	3,996	4,930	82	21,132
11	160	70	45	46	13	23	14	319	14	161	0	342	3,787	4,290	82	21,214
12	160	70	45	46	14	0	15	189	15	161	0	189	3,910	4,260	82	21,296
13	160	71	45	46	15	0	16	162	16	162	0	162	3,306	3,630	83	21,379
14	160	70	45	43	16	0	17	0	17	158	0	0	2,942	3,100	79	21,458
15	160	70	45	46	17	0	18	0	18	161	0	0	2,549	2,710	102	21,560
16	160	70	45	46	18	2	19	173	19	161	0	175	2,414	2,750	104	21,664
17	160	70	45	46	19	267	20	150	20	161	0	417	2,512	3,090	104	21,768
18	160	70	45	46	20	0	21	155	21	161	0	155	2,534	2,850	104	21,872
19	160	70	45	46	21	0	22	200	22	161	0	200	2,369	2,730	104	21,976
20	160	70	45	46	22	26	23	157	23	161	0	183	2,206	2,550	104	22,080
21	160	70	45	46	23	49	24	0	24	161	0	49	2,070	2,280	104	22,184
22	160	70	45	46	24	0	25	0	25	161	0	0	1,839	2,000	104	22,288
23	160	70	45	46	25	0	26	0	26	161	0	0	1,629	1,790	104	22,392
24	160	70	45	46	26	5	27	0	27	161	0	5	1,464	1,630	104	22,496
25	160	70	45	46	27	230	28	0	28	161	0	230	1,339	1,730	104	22,600
26	240	70	125	46	28	0	29	32	29	241	0	32	1,157	1,430	1	22,601
27	390	70	277	45	29	0	30	130	30	392	0	130	938	1,460	2	22,603
28	600	70	486	45	30	0	31	0	31	601	0	0	1,039	1,640	1	22,604
Total	5,710	2,173	2,148	1,423		8,677		5,758		5,744	0	14,435	127,571	147,750	1,960	

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 ending 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4.
Col. 8 - Releases by New York City for valve exercise or other purpose.
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 - Computed as described under Definitions of Terms and Procedures.
Col. 13 - Seasonal limit of cumulative credit beginning June 1, 1979 = 26,919 cfs-days.

Table 8. - 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 cubic feet per second for 24 hours

Controlled releases from New York City reservoirs					Lake Wallenpaupack		Mongaup Reservoir		Delaware River at Montague						
									Segregation of flow					Excess release credits	
Directed		Pepacton	Cannonsville	Neversink	Date	Controlled release	Date	Controlled release	Date	Controlled releases			Computed uncontrolled	Total	
										N.Y.C. reservoirs		Power-plants			
Date	Amount									Directed	Other				Daily	Cumulative
1980	1	2	3	4		5		6		7	8	9	10	11	12	13
May 29	600	70	484	45	May 31	0	June 1	0	June 1	599	0	0	1,121	1,720	-	-
30	603	70	493	45	June 1	0	2	91	2	608	0	91	1,021	1,720	-	-
31	748	70	639	46	2	273	3	194	3	755	0	467	998	2,220	-	-
June 1	430	70	312	48	3	215	4	265	4	430	0	480	1,270	2,180	-	-
2	368	70	252	48	4	0	5	205	5	370	0	205	1,145	1,720	-	-
3	621	70	506	46	5	0	6	281	6	622	0	281	917	1,820	-	-
4	764	70	647	43	6	0	7	302	7	760	0	302	968	2,030	-	-
5	838	70	722	45	7	0	8	0	8	837	0	0	1,333	2,170	-	-
6	432	71	316	45	8	0	9	281	9	432	0	281	1,107	1,820	-	-
7	354	70	243	46	9	467	10	270	10	359	0	737	1,094	2,190	-	-
8	568	70	456	46	10	476	11	270	11	572	0	746	1,142	2,460	-	-
9	414	70	299	45	11	450	12	178	12	414	0	628	1,158	2,200	-	-
10	165	70	56	46	12	489	13	86	13	172	0	575	1,113	1,860	-	-
11	367	71	251	45	13	496	14	0	14	367	0	496	797	1,660	-	-
12	1,060	70	947	45	14	0	15	0	15	1,062	0	0	598	1,660	-90	-90
13	978	70	859	45	15	0	16	165	16	974	0	165	501	1,640	-110	-200
14	340	71	360	45	16	475	17	227	17	340	136	702	822	2,000	250	50
15	648	71	594	45	17	270	18	286	18	648	62	556	694	1,960	210	260
16	699	70	586	45	18	260	19	302	19	701	0	562	597	1,860	110	370
17	668	70	557	45	19	262	20	238	20	672	0	500	728	1,900	150	520
18	728	70	620	45	20	236	21	270	21	735	0	506	529	1,770	20	540
19	1,246	70	1,125	45	21	0	22	65	22	1,240	0	65	705	2,010	260	800
20	1,278	70	1,162	45	22	5	23	0	23	1,277	0	5	508	1,790	40	840
21	854	70	738	45	23	472	24	0	24	853	0	472	575	1,900	150	990
22	1,142	70	1,024	45	24	199	25	0	25	1,139	0	199	472	1,810	60	1,050
23	1,164	70	1,049	74	25	237	26	0	26	1,164	29	237	480	1,910	160	1,210
24	1,192	110	1,010	74	26	244	27	0	27	1,194	0	244	422	1,860	110	1,320
25	1,173	121	982	76	27	233	28	0	28	1,179	0	233	448	1,860	110	1,430
26	1,391	121	1,230	43	28	0	29	0	29	1,394	0	0	546	1,940	190	1,620
27	1,418	73	1,312	43	29	0	30	0	30	1,428	0	0	1,452	2,880	1,130	2,750
Total	23,251	2,249	19,831	1,444		5,759		3,976		23,297	227	9,735	25,261	58,520	2,750	

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 ending 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4 (except June 17,18,26 and total).
Col. 8 - Releases by New York City for valve exercise or other purpose.
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 - 1,750 cfs, computed algebraically, but in no case greater than Col. 7 except during seasonal period that part or all of Col. 8 contributing to Col. 11 for quantities less than 1,880 and greater than 1,750.
Col. 13 - Seasonal limit of cumulative credit June 15, 1980 to March 14, 1981 = 15,041 cfs-days.

Table 8. - 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 cubic feet per second for 24 hours

Controlled releases from New York City reservoirs					Lake Wallenpaupack		Mongaup Reservoir		Delaware River at Montague						
									Segregation of flow					Excess release credits	
Directed		Pepacton	Cannonsville	Neversink	Date	Controlled release	Date	Controlled release	Date	Controlled releases N.Y.C. reservoirs		Power-plants	Computed uncontrolled	Total	
Date	Amount									Directed	Other				Daily	Cumulative
1980	1	2	3	4		5		6		7	8	9	10	11	12	13
June 28	876	70	760	46	June 30	155	July 1	130	July 1	876	0	285	2,579	3,740	876	3,626
29	644	70	529	45	July 1	7	2	249	2	644	0	256	2,100	3,000	644	4,270
30	0	70	348	48	2	219	3	270	3	0	466	489	1,625	2,580	0	4,270
July 1	0	70	348	45	3	234	4	0	4	0	463	234	1,563	2,260	83	4,353
2	408	70	347	45	4	0	5	0	5	408	54	0	1,178	1,640	-110	4,243
3	404	70	347	45	5	0	6	0	6	404	58	0	1,308	1,770	20	4,263
4	81	70	347	48	6	5	7	189	7	81	384	194	1,371	2,030	130	4,393
5	0	70	347	45	7	483	8	221	8	0	462	704	1,534	2,700	0	4,393
6	0	70	347	45	8	473	9	119	9	0	462	592	1,366	2,420	0	4,393
7	0	70	347	45	9	517	10	253	10	0	462	770	1,088	2,320	22	4,415
8	0	70	347	45	10	608	11	281	11	0	462	889	969	2,320	22	4,437
9	328	70	347	45	11	484	12	216	12	328	134	700	928	2,090	328	4,765
10	968	70	859	45	12	18	13	0	13	974	0	18	968	1,960	210	4,975
11	803	70	693	45	13	3	14	151	14	808	0	154	668	1,630	-120	4,855
12	327	70	345	45	14	658	15	346	15	327	133	1,004	766	2,230	327	5,182
13	405	71	343	45	15	696	16	324	16	405	54	1,020	751	2,230	405	5,587
14	395	70	343	45	16	865	17	254	17	395	63	1,119	793	2,370	395	5,982
15	473	70	364	45	17	600	18	281	18	479	0	881	800	2,160	410	6,392
16	407	121	345	74	18	461	19	97	19	407	133	558	842	1,940	190	6,582
17	1,029	121	840	74	19	0	20	0	20	1,035	0	0	525	1,560	-190	6,392
18	966	121	769	74	20	16	21	151	21	964	0	167	429	1,560	-190	6,202
19	477	121	343	74	21	893	22	491	22	477	61	1,384	698	2,620	477	6,679
20	389	121	342	70	22	479	23	232	23	389	144	711	946	2,190	389	7,068
21	0	118	342	45	23	491	24	400	24	0	505	891	844	2,240	130	7,198
22	341	70	343	45	24	474	25	259	25	341	117	733	879	2,070	320	7,518
23	636	71	528	45	25	471	26	265	26	644	0	736	640	2,020	270	7,788
24	1,233	70	1,125	46	26	0	27	0	27	1,241	0	0	529	1,770	20	7,808
25	1,076	70	967	45	27	0	28	0	28	1,082	0	0	518	1,600	-150	7,658
26	772	70	659	45	28	222	29	0	29	774	0	222	604	1,600	-150	7,508
27	174	70	340	46	29	237	30	130	30	174	282	367	697	1,520	-230	7,278
28	825	70	713	46	30	242	31	130	31	829	0	372	769	1,970	220	7,498
Total	14,437	2,475	15,364	1,546		10,011		5,439		14,486	4,899	15,450	31,275	66,110	4,748	

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 ending 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4 (except July 3-12, 15-17, 19, 22-25,30 and total).
Col. 8 = Releases by New York City for valve exercise or other purpose.
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 - 1,750 cfs, computed algebraically, but in no case greater than Col. 7 except during seasonal period that part or all of Col. 8 contributing to Col. 11 for quantities less than 1,880 and greater than 1,750.
Col. 13 - Seasonal limit of cumulative credit June 15, 1980 to March 14, 1981 = 15,041 cfs-days.

Table 8 - 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 cubic feet per second for 24 hours

Controlled releases from New York City reservoirs					Lake Wallenpaupack		Mongaup Reservoir		Delaware River at Montague							
									Segregation of flow						Excess release credits	
Directed		Pepacton	Cannonsville	Neversink	Date	Controlled release	Date	Controlled release	Date	Controlled releases N.Y.C. reservoirs		Power-plants	Computed uncon-trolled	Total	Daily	Cumulative
Date	Amount									Directed	Other					
1980	1	2	3	4		5		6		7	8	9	10	11	12	13
July 29	433	70	562	46	July 31	248	Aug. 1	130	Aug. 1	433	245	378	764	1,820	70	7,568
30	831	71	713	46	Aug. 1	378	2	0	2	830	0	378	872	2,080	330	7,898
31	1,229	71	1,120	46	2	0	3	0	3	1,237	0	0	923	2,160	410	8,308
Aug. 1	1,321	71	1,205	46	3	5	4	22	4	1,322	0	27	1,171	2,520	770	9,078
2	626	70	511	45	4	885	5	259	5	626	0	1,144	1,230	3,000	626	9,704
3	0	70	337	46	5	764	6	297	6	0	453	1,061	1,556	3,070	0	9,704
4	0	70	337	45	6	610	7	248	7	0	452	858	1,420	2,730	0	9,704
5	272	70	337	45	7	746	8	238	8	272	180	984	1,194	2,630	272	9,976
6	398	71	337	45	8	915	9	130	9	398	55	1,045	1,012	2,510	398	10,374
7	1,018	71	882	74	9	0	10	0	10	1,027	0	0	683	1,710	-40	10,334
8	1,049	121	849	74	10	2	11	140	11	1,044	0	142	554	1,740	-10	10,324
9	621	121	459	43	11	306	12	221	12	623	0	527	840	1,990	240	10,564
10	306	73	336	46	12	485	13	275	13	306	149	760	795	2,010	260	10,824
11	572	70	463	46	13	480	14	243	14	579	0	723	638	1,940	190	11,014
12	636	71	524	46	14	516	15	302	15	641	0	818	631	2,090	340	11,354
13	705	70	589	46	15	457	16	124	16	705	0	581	804	2,090	340	11,694
14	1,336	70	1,228	46	16	0	17	0	17	1,344	0	0	546	1,890	140	11,834
15	1,065	70	944	46	17	0	18	151	18	1,060	0	151	289	1,500	-250	11,584
16	820	70	712	46	18	236	19	0	19	828	0	236	626	1,690	-60	11,524
17	844	70	733	46	19	124	20	0	20	849	0	124	397	1,370	-380	11,144
18	796	70	682	46	20	257	21	0	21	798	0	257	445	1,500	-250	10,894
19	965	70	849	46	21	226	22	0	22	965	0	226	359	1,550	-200	10,694
20	1,027	70	910	45	22	258	23	0	23	1,025	0	258	387	1,670	-80	10,614
21	1,362	70	1,252	45	23	0	24	0	24	1,367	0	0	243	1,610	-140	10,474
22	1,417	70	1,299	45	24	0	25	86	25	1,414	0	86	170	1,670	-80	10,394
23	1,198	70	1,075	45	25	245	26	189	26	1,190	0	434	296	1,920	170	10,564
24	1,222	70	1,101	45	26	246	27	216	27	1,216	0	462	332	2,010	260	10,824
25	1,254	70	1,137	45	27	244	28	216	28	1,252	0	460	288	2,000	250	11,074
26	1,277	70	1,168	48	28	237	29	130	29	1,286	0	367	367	2,020	270	11,344
27	1,298	70	1,196	46	29	235	30	0	30	1,312	0	235	393	1,940	190	11,534
28	1,514	70	1,402	45	30	0	31	0	31	1,517	0	0	483	2,000	250	11,784
Total	27,412	2,281	25,249	1,470		9,105		3,617		27,466	1,534	12,722	20,708	62,430	4,286	

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 ending 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4 (except Aug. 1,6-9,13 and total).
Col. 8 - Releases by New York City for valve exercise or other purpose.
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 - 1,750 cfs, computed algebraically, but in no case greater than Col. 7 except during seasonal period that part or all of Col. 8 contributing to Col. 11 for quantities less than 1,880 and greater than 1,750.
Col. 13 - Seasonal limit of cumulative credit June 15, 1980 to March 14, 1981 = 15,041 cfs-days.

Table 8. - 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 cubic feet per second for 24 hours

Controlled releases from New York City reservoirs					Lake Wallenpaupack		Mongaup Reservoir		Delaware River at Montague						
									Segregation of flow					Excess release credits	
Directed		Pepacton	Cannonsville	Neversink	Date	Controlled release	Date	Controlled release	Date	Controlled releases			Computed uncontrolled	Total	
Date	Amount									N.Y.C. reservoirs		Power-plants			
										Directed	Other				Daily	Cumulative
1980	1	2	3	4		5		6		7	8	9	10	11	12	13
Aug. 29	1,468	70	1,329	74	Aug. 31	16	Sept. 1	0	Sept. 1	1,473	0	16	471	1,960	210	11,994
30	1,235	121	1,035	76	Sept. 1	0	2	151	2	1,232	0	151	387	1,770	20	12,014
31	873	121	679	76	2	245	3	0	3	876	0	245	719	1,840	90	12,104
Sept. 1	907	121	736	48	3	278	4	124	4	905	0	402	393	1,700	-50	12,054
2	1,024	70	922	48	4	300	5	0	5	1,040	0	300	530	1,870	120	12,174
3	977	70	876	46	5	248	6	0	6	992	0	248	480	1,720	-30	12,144
4	1,337	71	1,219	46	6	0	7	0	7	1,336	0	0	624	1,960	210	12,354
5	1,312	70	1,196	46	7	0	8	0	8	1,312	0	0	448	1,760	10	12,364
6	996	70	880	45	8	239	9	0	9	995	0	239	436	1,670	-80	12,284
7	1,084	70	970	45	9	266	10	0	10	1,085	0	266	309	1,660	-90	12,194
8	1,095	155	896	46	10	247	11	97	11	1,097	0	344	179	1,620	-130	12,064
9	1,158	232	882	45	11	263	12	100	12	1,159	0	363	228	1,750	0	12,064
10	1,240	308	886	45	12	255	13	0	13	1,239	0	255	406	1,900	150	12,214
11	1,537	311	1,187	45	13	0	14	0	14	1,543	0	0	217	1,760	10	12,224
12	1,558	311	1,205	45	14	51	15	0	15	1,561	0	51	108	1,720	-30	12,194
13	827	309	472	46	15	703	16	0	16	827	0	703	410	1,940	190	12,384
14	839	309	489	46	16	734	17	0	17	844	0	734	272	1,850	100	12,484
15	871	311	518	46	17	739	18	0	18	875	0	739	506	2,120	370	12,854
16	880	311	529	46	18	743	19	0	19	886	0	743	451	2,080	330	13,184
17	836	308	487	46	19	729	20	0	20	841	0	729	510	2,080	330	13,514
18	1,480	309	1,126	45	20	0	21	0	21	1,480	0	0	310	1,790	40	13,554
19	1,483	309	1,134	45	21	0	22	65	22	1,488	0	65	187	1,740	-10	13,544
20	744	309	396	45	22	780	23	0	23	750	0	780	530	2,060	310	13,854
21	662	308	314	50	23	707	24	0	24	672	0	707	351	1,730	-20	13,834
22	778	308	433	46	24	719	25	0	25	787	0	719	224	1,730	-20	13,814
23	700	308	348	46	25	752	26	0	26	702	0	752	356	1,810	60	13,874
24	630	280	305	46	26	730	27	0	27	631	0	730	389	1,750	0	13,874
25	1,401	308	1,050	45	27	0	28	0	28	1,403	0	0	227	1,630	-120	13,754
26	1,425	309	1,071	45	28	2	29	0	29	1,425	0	2	173	1,600	-150	13,604
27	801	309	450	43	29	742	30	0	30	802	0	742	356	1,900	150	13,754
Total	32,158	6,776	24,020	1,462		10,488		537		32,258	0	11,025	11,187	54,470	1,970	

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 ending 1600 of date shown.
Col. 7 = Col. 2 + Col. 3 + Col. 4.
Col. 8 - Releases by New York City for valve exercise or other purpose.
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 - 1,750 cfs, computed algebraically, but in no case greater than Col. 7 except during seasonal period that part or all of Col. 8 contributing to Col. 11 for quantities less than 1,880 and greater than 1,750.
Col. 13 - Seasonal limit of cumulative credit beginning June 15, 1980 = 15,041 cfs-days.

Table 8. - 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 cubic feet per second for 24 hours

Controlled releases from New York City reservoirs					Lake Wallenpaupack		Mongaup Reservoir		Delaware River at Montague						
									Segregation of flow					Excess release credits	
Directed		Pepacton	Cannonsville	Neversink	Date	Controlled	Date	Controlled	Date	Controlled releases			Computed uncontrolled	Total	
Date	Amount									N.Y.C. reservoirs Directed	N.Y.C. reservoirs Other	Powerplants			Daily
1980	1	2	3	4		5		6		7	8	9	10	11	12
Sept 28	786	309	442	45	Sept 30	740	Oct. 1	0	Oct. 1	796	0	740	324	1,860	110
29	1,512	309	1,154	46	Oct. 1	0	2	0	2	1,509	0	0	181	1,690	-60
30	1,632	309	1,267	46	2	0	3	22	3	1,622	0	22	176	1,820	70
Oct. 1	1,600	309	1,242	46	3	120	4	0	4	1,597	0	120	363	2,080	330
2	1,547	309	1,194	46	4	19	5	0	5	1,549	0	19	222	1,790	40
3	1,570	312	1,213	46	5	2	6	0	6	1,571	0	2	247	1,820	70
4	1,403	308	1,049	46	6	251	7	0	7	1,403	0	251	286	1,940	190
5	1,527	308	1,173	46	7	120	8	0	8	1,527	0	120	373	2,020	270
6	1,567	309	1,211	46	8	122	9	0	9	1,566	0	122	322	2,010	260
7	1,584	309	1,221	46	9	112	10	0	10	1,576	0	112	272	1,960	7
8	1,579	461	1,074	46	10	118	11	0	11	1,581	0	118	261	1,960	-
9	1,423	469	924	45	11	0	12	0	12	1,438	0	0	242	1,680	-
10	1,429	463	931	45	12	0	13	0	13	1,439	0	0	201	1,640	-
11	1,360	464	859	46	13	121	14	0	14	1,369	0	121	230	1,720	-
12	1,340	461	835	45	14	125	15	0	15	1,341	0	125	234	1,700	-
13	1,339	464	831	45	15	122	16	0	16	1,340	0	122	238	1,700	-
14	1,340	466	826	45	16	143	17	0	17	1,337	0	143	220	1,700	-
15	1,352	464	840	45	17	117	18	0	18	1,349	0	117	294	1,760	-
16	1,228	684	574	45	18	0	19	0	19	1,303	0	0	317	1,620	-
17	1,224	679	514	45	19	0	20	0	20	1,238	0	0	282	1,520	-
18	1,305	674	586	45	20	0	21	0	21	1,305	0	0	275	1,580	-
19	1,349	682	631	45	21	0	22	0	22	1,358	0	0	272	1,630	-
20	1,377	679	657	45	22	0	23	0	23	1,381	0	0	249	1,630	-
21	1,359	681	631	46	23	0	24	0	24	1,358	0	0	252	1,610	-
22	1,365	679	644	42	24	0	25	0	25	1,365	0	0	415	1,780	-
23	718	294	407	17	25	0	26	0	26	718	0	0	1,652	2,370	-
24	0	19	26	17	26	0	27	0	27	0	62	0	2,448	2,510	-
25	0	20	26	17	27	0	28	0	28	0	63	0	2,187	2,250	-
26	0	20	26	15	28	0	29	0	29	0	61	0	1,509	1,570	-
27	0	19	26	15	29	0	30	0	30	0	60	0	1,200	1,260	-
28	481	71	376	46	30	0	31	0	31	493	0	0	747	1,240	-
Total	36,296	12,004	23,410	1,261		2,232		22		36,429	24¢	2,254	16,491	55,420	1,287

Col. 2 - 24 hours beginning 1200 of date shown, except 25 hours Oct. 25.
Col. 3 - 24 hours ending 2400 one day later, except 25 hours Oct. 25.
Col. 4 - 24 hours beginning one day later, except 25 hours Oct. 24.
Col. 5 - 24 hours beginning 0800 of date shown, except 25 hours Oct. 25.
Col. 6 - 24 hours ending 1600 of date shown, except 25 hours Oct. 26.
Col. 7 = Col. 2 + Col. 3 + Col. 4 (except Oct. 27-30 and total).
Col. 8 - Releases by New York City for valve exercise or other purpose.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown, except 25 hours Oct. 26.
Col. 12 - Col. 11 - 1,750 cfs, computed algebraically, but in no case greater than Col. 7 except during seasonal period that part or all of Col. 8 contributing to Col. 11 for quantities less than 1,880 and greater than 1,750.
Col. 13 - Seasonal limit of cumulative credit beginning June 15, 1980 = 15,041 cfs-days; expired October 10.

Table 8. - 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 cubic feet per second for 24 hours

Controlled releases from New York City reservoirs					Lake Wallenpaupack		Mongaup Reservoir		Delaware River at Montague						
									Segregation of flow						Excess release credits
Directed		Pepacton	Cannonsville	Neversink	Date	Controlled release	Date	Controlled release	Date	Controlled releases			Computed uncontrolled	Total	
Date	Amount									N.Y.C. reservoirs Directed	N.Y.C. reservoirs Other	Power-plants			Daily / Cumulative
1980	1	2	3	4		5		6		7	8	9	10	11	12 / 13
Oct. 29	715	453	241	26	Oct. 31	0	Nov.1	0	Nov. 1	720	0	0	780	1,500	
30	864	565	269	26	Nov. 1	0	2	216	2	860	0	216	464	1,540	
31	969	678	268	23	2	0	3	108	3	969	0	108	713	1,790	
Nov. 1	1,073	678	371	25	3	0	4	0	4	1,074	0	0	606	1,680	
2	1,086	673	390	25	4	0	5	0	5	1,088	0	0	542	1,630	
3	1,088	670	390	25	5	0	6	0	6	1,085	0	0	495	1,580	
4	1,120	670	430	25	6	0	7	0	7	1,125	0	0	455	1,580	
5	1,202	667	517	26	7	0	8	0	8	1,210	0	0	450	1,660	
6	1,211	667	521	25	8	0	9	0	9	1,213	0	0	497	1,710	
7	1,030	654	351	25	9	0	10	0	10	1,030	0	0	660	1,690	
8	1,006	653	325	25	10	0	11	0	11	1,003	0	0	757	1,760	
9	1,082	656	404	25	11	0	12	0	12	1,085	0	0	685	1,770	
10	1,025	656	347	26	12	0	13	0	13	1,029	0	0	681	1,710	
11	1,017	657	337	25	13	0	14	0	14	1,019	0	0	611	1,630	
12	994	656	316	25	14	0	15	0	15	997	0	0	603	1,600	
13	934	645	265	23	15	52	16	0	16	933	0	52	625	1,610	
14	995	647	326	22	16	22	17	0	17	995	0	22	613	1,630	
15	873	586	263	26	17	499	18	0	18	875	0	499	806	2,180	
16	876	594	263	26	18	242	19	0	19	883	0	242	765	1,890	
17	759	574	159	26	19	227	20	0	20	759	0	227	814	1,800	
18	617	278	314	25	20	252	21	0	21	617	0	252	781	1,650	
19	531	351	158	26	21	283	22	0	22	535	0	283	872	1,690	
20	810	528	261	26	22	0	23	0	23	815	0	0	665	1,480	
21	767	557	184	26	23	7	24	65	24	767	0	72	771	1,610	
22	314	142	147	22	24	281	25	0	25	311	0	281	3,798	4,390	
23	516	373	138	5	25	383	26	135	26	516	0	518	6,166	7,200	
24	0	6	26	5	26	232	27	86	27	0	37	318	4,765	5,120	
25	0	6	26	5	27	228	28	0	28	0	37	228	3,615	3,880	
26	0	6	26	5	28	219	29	0	29	0	37	219	3,284	3,540	
27	0	6	26	5	29	0	30	0	30	0	37	0	3,363	3,400	
Total	23,474	14,952	8,059	650		2,927		610		23,513	148	3,537	40,702	67,900	

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 ending 1600 of date shown.

Col. 7 = Col. 2 + Col. 3 + Col. 4, except Nov. 27-30 and total.
Col. 8 - Releases by New York City for valve exercise or other purpose.
Col. 9 = Col. 5 + Col. 6.
Col. 10 = Col. 11 - Col. 7 - Col. 8 - Col. 9.
Col. 11 = 24 hours of calendar day shown.

Table 9a. - New York City Reservoir release design data

(River Master daily operation record)

Advance estimate of discharge of Delaware River at Montague exclusive of New York City reservoir releases							Indicated deficiency cfs	Increase above indicated deficiency for augmented conservation rate cfs	Directed release cfs
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Date	Discharge cfs			
	Lake Wallenpaupack cfs	Mongaup Reservoir cfs	Present conditions cfs	Weather adjustment cfs					
1979/80	1	2	3	4		5	6	7	8
DECEMBER 1, 1979 TO MAY 31, 1980 MONTAGUE DESIGN RATE = 1,750 CFS UNDER MEMORANDUM OF AGREEMENT									
December 1, 1979 to January 12, 1980 estimated Montague discharge greater than 1,750 cfs									
Jan. 9	0	0	1,320	76	Jan. 13	1,396	354		354
January 14-26, 1980 estimated Montague discharge greater than 1,750 cfs									
Jan.23	0	0	1,200	0	27	1,200	550		550
24	0	150	1,200	0	28	1,350	400		400
25	238	0	1,230	0	29	1,468	282		282
26	238	100	1,280	0	30	1,618	132		132
27	238	0	1,290	0	31	1,528	222		222
Total	714	250	7,520	76		8,560	1,940		1,940

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 precipitation forecasts.

Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = 1,750 cfs - Col. 5, except total.
Col. 7 = 108 cfs - indicated deficiency when less than 108 cfs.
Col. 8 = Col. 6 + Col. 7.

Table 9a. - New York City Reservoir release design data - continued

(River Master daily operation record)

Advance estimate of discharge of Delaware River at Montague exclusive of New York City reservoir releases							Indicated deficiency	Increase above indicated deficiency for augmented conservation rate	Directed release
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Date	Discharge			
	Lake Wallenpaupack	Mongaup Reservoir	Present conditions	Weather adjustment					
	cfs	cfs	cfs	cfs		cfs	cfs	cfs	cfs
1980	1	2	3	4		5	6	7	8
Jan. 28	238	0	1,200	0	Feb. 1	1,438	312		312
29	238	0	1,290	0	2	1,528	222		222
30	0	0	1,180	0	3	1,180	570		570
31	0	0	1,090	0	4	1,090	660		660
Feb. 1	238	0	1,050	0	5	1,288	462		462
2	238	0	1,000	0	6	1,238	512		512
3	238	0	970	0	7	1,208	542		542
4	238	0	900	0	8	1,138	612		612
5	238	0	990	0	9	1,228	522		522
6	0	0	950	0	10	950	800		800
7	0	0	1,000	0	11	1,000	750		750
8	238	0	940	0	12	1,178	572		572
9	238	0	970	0	13	1,208	542		542
10	238	0	920	0	14	1,158	592		592
11	238	0	950	50	15	1,238	512		512
12	238	0	930	70	16	1,238	512		512
13	0	0	900	120	17	1,020	730		730
14	0	0	860	100	18	960	790		790
15	0	100	840	50	19	990	760		760
16	238	150	800	25	20	1,213	537		537
17	238	150	790	75	21	1,253	497		497
18	238	100	770	200	22	1,308	442		442
19	238	0	790	400	23	1,428	322		322
20	0	0	750	300	24	1,050	700		700
21	0	0	952	500	25	1,452	298		298
22	238	0	1,020	500	26	1,758	0	108	108
23	238	0	970	350	27	1,558	192		192
24	238	0	970	200	28	1,408	342		342
25	238	0	810	50	29	1,098	652		652
Total	4,760	500	27,552	2,990		35,802	14,956	108	15,064

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 precipitation forecasts.

Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = 1,750 cfs - Col. 5, except total.
Col. 7 = 108 cfs - indicated deficiency when less than 108 cfs.
Col. 8 = Col. 6 + Col. 7.

Table 9a. - New York City Reservoir release design data - continued

(River Master daily operation record)

Advance estimate of discharge of Delaware River at Montague exclusive of New York City reservoir releases									
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Date	Discharge	Indicated deficiency	Increase above indicated deficiency for augmented conservation rate	Directed release
	Lake Wallenpaupack cfs	Mongaup Reservoir cfs	Present conditions cfs	Weather adjustment cfs		cfs	cfs	cfs	cfs
1980	1	2	3	4		5	6	7	8
Feb. 26	238	0	910	0	Mar. 1	1,148	602		602
27	0	0	880	0	2	880	870		870
28	0	0	850	0	3	850	900		900
29	238	0	830	0	4	1,068	682		682
Mar. 1	238	0	800	0	5	1,038	712		712
2	238	0	790	0	6	1,028	722		722
3	238	0	780	150	7	1,168	582		582
4	238	0	770	500	8	1,508	242		242
5	0	0	780	400	9	1,180	570		570
6	0	0	770	576	10	1,346	404		404
7	239	0	800	650	11	1,689	61	47	108
8	0	0	1,000	650	12	1,650	100	8	108
9	0	0	1,750	0	13	1,750	0	108	108
10	0	0	1,750	0	14	1,750	0	108	108
11	0	0	1,750	0	15	1,750	0	108	108
12	0	0	1,750	0	16	1,750	0	108	108
13	0	0	1,750	0	17	1,750	0	108	108
14	0	250	1,200	100	18	1,550	200		200
15	0	250	1,390	500	19	2,140	0	108	108
16	0	200	1,180	1,000	20	2,380	0	108	108
17 & 18	0	300	1,100	1,000	21	2,400	0	216	216
March 22 to May 28, 1980 estimated Montague discharge greater than 1,750 cfs									
May 26	0	150	1,360	0	May 29	1,510	240		240
27	0	150	1,210	0	30	1,360	390		390
28	0	0	1,150	0	31	1,150	600		600
Total	1,667	1,300	27,300	5,526		35,793	7,877	1,027	8,904

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 precipitation forecasts.

Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = 1,750 cfs - Col. 5, except total.
Col. 7 = 108 cfs - indicated deficiency when less than 108 cfs, to March 31.
Col. 8 = Col. 6 + Col. 7.

Table 9a. - New York City Reservoir release design data - continued

(River Master daily operation record)

Advance estimate of discharge of Delaware River at Montague exclusive of New York City reservoir releases									
Date of advance estimate	Powerplant release forecasts: Lake Wallenpaupack cfs	Powerplant release forecasts: Mongaup Reservoir cfs	Uncontrolled runoff: Present conditions cfs	Uncontrolled runoff: Weather adjustment cfs	Date	Discharge cfs	Indicated deficiency cfs		Directed release cfs
1980	1	2	3	4		5	6	7	8
JUNE 1-14, 1980 MONTAGUE DESIGN RATE = 1,750 CFS									
May 29	0	0	1,090	60	June 1	1,150	600		600
30	0	150	920	77	2	1,147	603		603
31	235	100	590	77	3	1,002	748		748
June 1	0	100	933	287	4	1,320	430		430
2	0	100	912	370	5	1,382	368		368
3	0	100	917	112	6	1,129	621		621
4	0	0	986	0	7	986	764		764
5	0	0	871	41	8	912	838		838
6	0	125	786	407	9	1,318	432		432
7	235	250	823	88	10	1,396	354		354
8	0	250	920	12	11	1,182	568		568
9	187	150	955	44	12	1,336	414		414
10	470	150	965	0	13	1,585	165		165
11	470	0	913	0	14	1,383	367		367
Total	1,597	1,475	12,581	1,575		17,228	7,272		7,272

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 precipitation forecasts.

Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = 1,750 cfs - Col. 5, except total.
Col. 8 = Col. 6 + Col. 7.

Table 9b. - New York City Reservoir release design data

(River Master daily operation record)

Date of advance estimate	Advance estimate of discharge of Delaware River at Montague exclusive of New York City reservoir releases: Powerplant release forecasts: Lake Wallenpaupack	Powerplant release forecasts: Mongaup Reservoir	Uncontrolled runoff: Present conditions	Uncontrolled runoff: Weather adjustment	Date	Discharge	Indicated deficiency	Balancing adjustment	Directed release	Computations for balancing adjustment: Directed release: Daily	Directed release: Cumulative	Actual deficiency: Daily	Actual deficiency: Cumulative	Cumulative difference Col. 10 - Col. 12	Balancing adjustment
	cfs	cfs	cfs	cfs		cfs	cfs	cfs	cfs	cfs	cfs	cfs	cfs	cfs-days	cfs
1980	1	2	3	4		5	6	7	8	9	10	11	12	13	14
JUNE 15 TO OCTOBER 11, 1980 MONTAGUE DESIGN RATE = 1,880 CFS															
June 12	0	0	820	0	June 15	820	1,060	-	1,060	1,060	1,060	1,282	1,282	-222	22
13	0	175	727	0	16	902	978	-	978	978	2,038	1,214	2,496	-458	46
14	470	300	675	95	17	1,540	340	-	340	340	2,378	356	2,852	-474	47
15	235	270	671	56	18	1,232	648	-	648	648	3,026	630	3,482	-456	46
16	235	270	698	0	19	1,203	677	22	699	699	3,725	721	4,203	-478	48
17	235	300	657	66	20	1,258	622	46	668	668	4,393	652	4,855	-462	46
18	235	300	607	57	21	1,199	681	47	728	728	5,121	845	5,700	-579	58
19	0	50	572	58	22	680	1,200	46	1,246	1,246	6,367	1,110	6,810	-443	44
20	0	0	592	58	23	650	1,230	48	1,278	1,278	7,645	1,367	8,177	-532	53
21	470	0	602	0	24	1,072	808	46	854	854	8,499	833	9,010	-511	51
22	235	0	561	0	25	796	1,084	58	1,142	1,142	9,641	1,209	10,219	-578	58
23	235	0	525	0	26	760	1,120	44	1,164	1,164	10,805	1,163	11,382	-577	58
24	235	0	506	0	27	741	1,139	53	1,192	1,192	11,997	1,214	12,596	-599	60
25	235	0	491	32	28	758	1,122	51	1,173	1,173	13,170	1,199	13,795	-625	62
26	0	0	469	78	29	547	1,333	58	1,391	1,391	14,561	1,334	15,129	-568	57
27	0	0	456	64	30	520	1,360	58	1,418	1,418	15,979	428	15,557	422	-41
Total	2,820	1,665	9,629	564		14,678	15,402		15,979	15,979		15,557			

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 precipitation forecasts.

Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = 1,880 - Col. 5, except total.
Col. 7 = Col. 14 (4 days earlier).
Col. 8 = Col. 6 + Col. 7, when positive and/or Col. 5 is equal to design rate or less; otherwise Col. 8 = 0.

Col. 9 = Col. 8.
Col. 10 = Summation of Col. 9.
Col. 11 = 1,880 - (Col. 9 + Col. 10 from Table 8).
Col. 12 = Summation of Col. 11.
Col. 14 = Col. 13 divided by minus 10.

Table 9b. - New York City Reservoir release design data - continued

(River Master daily operation record)

Advance estimate of discharge of Delaware River at Montague exclusive of New York City reservoir releases							Indicated deficiency	Balancing adjustment	Directed release	Computations for balancing adjustment					
	Powerplant release forecasts									Directed release		Actual deficiency		Cumulative difference Col. 10 − Col. 12	Balancing adjustment
Date of advance estimate	Lake Wallenpaupack	Mongaup Reservoir	Present conditions	Weather adjustment	Date	Discharge				Daily	Cumulative	Daily	Cumulative		
	cfs	cfs	cfs	cfs		cfs	cfs	cfs	cfs	cfs	cfs	cfs	cfs	cfs-days	cfs
1980	1	2	3	4		5	6	7	8	9	10	11	12	13	14
June 28	470	0	428	166	July 1	1,064	816	60	876	876	16,855	0	15,557	1,298	−130
29	235	0	427	636	2	1,298	582	62	644	644	17,499	0	15,557	1,942	−130
30	235	0	2,938	49	3	3,222	0	57	0	0	17,499	0	15,557	1,942	−130
July 1	235	0	1,702	31	4	1,968	0	−42	0	0	17,499	83	15,640	1,859	−130
2	0	0	1,271	71	5	1,342	538	−130	408	408	17,907	702	16,342	1,565	−130
3	0	0	1,169	177	6	1,346	534	−130	404	404	18,311	572	16,914	1,397	−130
4	0	250	996	423	7	1,669	211	−130	81	81	18,392	315	17,229	1,163	−116
5	470	250	833	323	8	1,876	0	−130	0	0	18,392	0	17,229	1,163	−116
6	470	250	1,594	0	9	2,314	0	−130	0	0	18,392	0	17,229	1,163	−116
7	470	200	1,139	63	10	1,872	18	−130	0	0	18,392	22	17,251	1,141	−114
8	470	200	986	1,117	11	2,773	0	−116	0	0	18,392	22	17,273	1,119	−112
9	470	0	863	103	12	1,436	444	−116	328	328	18,720	252	17,525	1,195	−120
10	0	0	796	0	13	796	1,084	−116	968	968	19,688	894	18,419	1,269	−127
11	0	200	712	51	14	963	917	−114	803	803	20,491	1,058	19,477	1,014	−101
12	472	200	734	35	15	1,441	439	−112	327	327	20,818	110	19,587	1,231	−123
13	472	200	683	0	16	1,355	525	−120	405	405	21,223	109	19,696	1,527	−130
14	472	200	636	50	17	1,358	522	−127	395	395	21,618	0	19,696	1,922	−130
15	472	200	565	69	18	1,306	574	−101	473	473	22,091	199	19,895	2,196	−130
16	472	0	532	346	19	1,350	530	−123	407	407	22,498	480	20,375	2,123	−130
17	0	0	530	191	20	721	1,159	−130	1,029	1,029	23,527	1,355	21,730	1,797	−130
18	0	173	535	76	21	784	1,096	−130	966	966	24,493	1,284	23,014	1,479	−130
19	573	200	478	22	22	1,273	607	−130	477	477	24,970	0	23,014	1,956	−130
20	523	270	449	119	23	1,361	519	−130	389	389	25,359	223	23,237	2,122	−130
21	473	200	424	1,071	24	2,168	0	−130	0	0	25,359	145	23,382	1,977	−130
22	473	200	546	190	25	1,409	471	−130	341	341	25,700	268	23,650	2,050	−130
23	473	130	511	0	26	1,114	766	−130	636	636	26,336	504	24,154	2,182	−130
24	0	0	517	0	27	517	1,363	−130	1,233	1,233	27,569	1,351	25,505	2,064	−130
25	0	173	501	0	28	674	1,206	−130	1,076	1,076	28,645	1,362	26,867	1,778	−130
26	236	250	430	62	29	978	902	−130	772	772	29,417	1,054	27,921	1,496	−130
27	236	250	390	700	30	1,576	304	−130	174	174	29,591	816	28,737	854	−85
28	236	250	373	66	31	925	955	−130	825	825	30,416	739	29,476	940	−94
Total	9,108	4,246	24,688	6,207		44,249	17,082		14,437	14,437		13,919			

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 precipitation forecasts.

Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = 1,880 - Col. 5, except total.
Col. 7 = Col. 14 (4 days earlier).
Col. 8 = Col. 6 + Col. 7, when positive and/or Col. 5 is equal to design rate or less; otherwise Col. 8 = 0.

Col. 9 = Col. 8.
Col. 10 = Summation of Col. 9.
Col. 11 = 1,880 − (Col. 9 + Col. 10 from Table 8).
Col. 12 = Summation of Col. 11.
Col. 14 = Col. 13 divided by minus 10.

Table 9b. - New York City Reservoir release design data - continued

(River Master daily operation record)

Date of advance estimate	Advance estimate of discharge of Delaware River at Montague exclusive of New York City reservoir releases						Indicated deficiency	Balancing adjustment	Directed release	Computations for balancing adjustment					
	Powerplant release forecasts		Uncontrolled runoff		Date	Discharge				Directed release		Actual deficiency		Cumulative difference Col. 10 - Col. 12	Balancing adjustment
	Lake Wallenpaupack	Mongaup Reservoir	Present conditions	Weather adjustment						Daily	Cumulative	Daily	Cumulative		
	cfs	cfs	cfs	cfs		cfs	cfs	cfs	cfs	cfs	cfs	cfs	cfs	cfs-days	cfs
1980	1	2	3	4		5	6	7	8	9	10	11	12	13	14
July 29	236	250	369	462	Aug. 1	1,317	563	-130	433	433	30,849	738	30,214	635	-64
30	236	130	450	103	2	919	961	-130	831	831	31,680	630	30,844	836	-84
31	0	0	423	143	3	566	1,314	-85	1,229	1,229	32,909	957	31,801	1,108	-111
Aug. 1	0	0	440	25	4	465	1,415	-94	1,321	1,321	34,230	682	32,483	1,747	-130
2	473	150	475	92	5	1,190	690	-64	626	626	34,856	0	32,483	2,373	-130
3	473	250	783	456	6	1,962	0	-84	0	0	34,856	0	32,483	2,373	-130
4	473	250	1,005	63	7	1,791	89	-111	0	0	34,856	0	32,483	2,373	-130
5	473	250	714	41	8	1,478	402	-130	272	272	35,128	0	32,483	2,645	-130
6	473	0	840	39	9	1,352	528	-130	398	398	35,526	0	32,483	3,043	-130
7	0	0	684	48	10	732	1,148	-130	1,018	1,018	36,544	1,197	33,680	2,864	-130
8	0	100	593	8	11	701	1,179	-130	1,049	1,049	37,593	1,184	34,864	2,729	-130
9	473	100	540	16	12	1,129	751	-130	621	621	38,214	513	35,377	2,837	-130
10	473	250	464	257	13	1,444	436	-130	306	306	38,520	325	35,702	2,818	-130
11	474	250	443	11	14	1,178	702	-130	572	572	39,092	519	36,221	2,871	-130
12	474	200	429	11	15	1,114	766	-130	636	636	39,728	431	36,652	3,076	-130
13	474	130	406	35	16	1,045	835	-130	705	705	40,433	495	37,147	3,286	-130
14	0	0	386	28	17	414	1,466	-130	1,336	1,336	41,769	1,334	38,481	3,288	-130
15	0	200	475	10	18	685	1,195	-130	1,065	1,065	42,834	1,440	39,921	2,913	-130
16	238	250	442	0	19	930	950	-130	820	820	43,654	1,018	40,939	2,715	-130
17	238	250	392	26	20	906	974	-130	844	844	44,498	1,359	42,298	2,200	-130
18	238	250	372	94	21	954	926	-130	796	796	45,294	1,178	43,476	1,818	-130
19	238	200	335	12	22	785	1,095	-130	965	965	46,259	1,295	44,771	1,488	-130
20	238	100	373	12	23	723	1,157	-130	1,027	1,027	47,286	1,235	46,006	1,280	-128
21	0	0	352	36	24	388	1,492	-130	1,362	1,362	48,648	1,637	47,643	1,005	-100
22	0	0	333	0	25	333	1,547	-130	1,417	1,417	50,065	1,624	49,267	798	-80
23	238	0	314	0	26	552	1,328	-130	1,198	1,198	51,263	1,150	50,417	846	-85
24	238	0	292	0	27	530	1,350	-128	1,222	1,222	52,485	1,086	51,503	982	-98
25	238	0	288	0	28	526	1,354	-100	1,254	1,254	53,739	1,132	52,635	1,104	-110
26	238	0	264	21	29	523	1,357	-80	1,277	1,277	55,016	1,146	53,781	1,235	-124
27	238	0	259	0	30	497	1,383	-85	1,298	1,298	56,314	1,252	55,033	1,281	-128
28	0	0	245	23	31	268	1,612	-98	1,514	1,514	57,828	1,397	56,430	1,398	-130
Total	7,585	3,560	14,180	2,072		27,397	30,965		27,412	27,412		26,954			

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 precipitation forecasts.

Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = 1,880 - Col. 5, except total.
Col. 7 = Col. 14 (4 days earlier).
Col. 8 = Col. 6 + Col. 7, when positive and/or Col. 5 is equal to design rate or less; otherwise Col. 8 = 0.

Col. 9 = Col. 8.
Col. 10 = Summation of Col. 9.
Col. 11 = 1,880 - (Col. 9 + Col. 10 from Table 8).
Col. 12 = Summation of Col. 11.
Col. 14 = Col. 13 divided by minus 10.

Table 9b. - New York City Reservoir release design data - continued

(River Master daily operation record)

Advance estimate of discharge of Delaware River at Montague exclusive of New York City reservoir releases							Indicated deficiency	Balancing adjustment	Directed release	Directed release		Actual deficiency		Cumulative difference Col. 10 - Col. 12	Balancing adjustment
Date of advance estimate	Powerplant release forecasts		Uncontrolled runoff		Date	Discharge				Daily	Cumulative	Daily	Cumulative		
	Lake Wallenpaupack cfs	Mongaup Reservoir cfs	Present conditions cfs	Weather adjustment cfs		cfs	cfs	cfs	cfs	cfs	cfs	cfs	cfs	cfs-days	cfs
1980	1	2	3	4		5	6	7	8	9	10	11	12	13	14
Aug. 29	0	0	246	56	Sept.1	302	1,578	-110	1,468	1,468	59,296	1,393	57,823	1,473	-130
30	0	100	396	25	2	521	1,359	-124	1,235	1,235	60,531	1,342	59,165	1,366	-130
31	238	50	591	0	3	879	1,001	-128	873	873	61,404	916	60,081	1,323	-130
Sept. 1	238	0	520	85	4	843	1,037	-130	907	907	62,311	1,085	61,166	1,145	-114
2	238	50	425	13	5	726	1,154	-130	1,024	1,024	63,335	1,050	62,216	1,119	-112
3	238	0	509	26	6	773	1,107	-130	977	977	64,312	1,152	63,368	944	-94
4	0	0	393	20	7	413	1,467	-130	1,337	1,337	65,649	1,256	64,624	1,025	-102
5	0	0	358	96	8	454	1,426	-114	1,312	1,312	66,961	1,432	66,056	905	-90
6	238	0	534	0	9	772	1,108	-112	996	996	67,957	1,205	67,261	696	-70
7	238	0	458	6	10	702	1,178	-94	1,084	1,084	69,041	1,305	68,566	475	-48
8	238	0	390	55	11	683	1,197	-102	1,095	1,095	70,136	1,357	69,923	213	-21
9	238	0	351	43	12	632	1,248	-90	1,158	1,158	71,294	1,289	71,212	82	-8
10	238	0	332	0	13	570	1,310	-70	1,240	1,240	72,534	1,219	72,431	103	-10
11	0	0	295	0	14	295	1,585	-48	1,537	1,537	74,071	1,663	74,094	-23	2
12	0	0	271	30	15	301	1,579	-21	1,558	1,558	75,629	1,721	75,815	-186	19
13	715	0	255	75	16	1,045	835	-8	827	827	76,456	767	76,582	-126	13
14	715	0	249	67	17	1,031	849	-10	839	839	77,295	874	77,456	-161	16
15	715	0	270	26	18	1,011	869	2	871	871	78,166	635	78,091	75	-8
16	715	0	253	51	19	1,019	861	19	880	880	79,046	686	78,777	269	-27
17	715	0	259	83	20	1,057	823	13	836	836	79,882	641	79,418	464	-46
18	0	0	416	0	21	416	1,464	16	1,480	1,480	81,362	1,570	80,988	374	-37
19	0	0	389	0	22	389	1,491	-8	1,483	1,483	82,845	1,628	82,616	229	-23
20	715	0	366	28	23	1,109	771	-27	744	744	83,589	570	83,186	403	-40
21	715	0	348	109	24	1,172	708	-46	662	662	84,251	822	84,008	243	-24
22	715	0	318	32	25	1,065	815	-37	778	778	85,029	937	84,945	84	-8
23	717	0	309	131	26	1,157	723	-23	700	700	85,729	772	85,717	12	-1
24	717	0	274	219	27	1,210	670	-40	630	630	86,359	761	86,478	-119	12
25	0	0	272	183	28	455	1,425	-24	1,401	1,401	87,760	1,653	88,131	-371	37
26	0	0	447	0	29	447	1,433	-8	1,425	1,425	89,185	1,705	89,836	-651	65
27	717	0	361	0	30	1,078	802	-1	801	801	89,986	782	90,618	-632	63
Total	10,013	200	10,855	1,459		22,527	33,873		32,158	32,158		34,188			

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 precipitation forecasts.

Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = 1,880 - Col. 5, except total.
Col. 7 = Col. 14 (4 days earlier).
Col. 8 = Col. 6 + Col. 7, when positive and/or Col. 5 is equal to design rate or less; otherwise Col. 8 = 0.

Col. 9 = Col. 8.
Col. 10 = Summation of Col. 9.
Col. 11 = 1,880 - (Col. 9 + Col. 10 from Table 8).
Col. 12 = Summation of Col. 11.
Col. 14 = Col. 13 divided by minus 10.

Table 9b. - New York City Reservoir release design data - continued

(River Master daily operation record)

Advance estimate of discharge of Delaware River at Montague exclusive of New York City reservoir releases							Indicated deficiency	Balancing adjustment	Directed release	Computations for balancing adjustment					
	Powerplant release forecasts									Directed release		Actual deficiency		Cumulative difference Col. 10 - Col. 12	Balancing adjustment
Date of advance estimate	Lake Wallenpaupack	Mongaup Reservoir	Present conditions	Weather adjustment	Date	Discharge				Daily	Cumulative	Daily	Cumulative		
	cfs	cfs	cfs	cfs		cfs	cfs	cfs	cfs	cfs	cfs	cfs	cfs	cfs-days	cfs
1980	1	2	3	4		5	6	7	8	9	10	11	12	13	14
Sept. 28	717	0	364	25	Oct. 1	1,106	774	12	786	786	90,772	816	91,434	-662	66
29	0	0	318	87	2	405	1,475	37	1,512	1,512	92,284	1,699	93,133	-849	85
30	0	0	313	0	3	313	1,567	65	1,632	1,632	93,916	1,682	94,815	-899	90
Oct. 1	0	0	294	49	4	343	1,537	63	1,600	1,600	95,516	1,397	96,212	-696	70
2	0	0	276	123	5	399	1,481	66	1,547	1,547	97,063	1,639	97,851	-788	79
3	0	0	333	62	6	395	1,485	85	1,570	1,570	98,633	1,631	99,482	-849	85
4	240	0	320	7	7	567	1,313	90	1,403	1,403	100,036	1,343	100,825	-789	79
5	120	0	303	0	8	423	1,457	70	1,527	1,527	101,563	1,387	102,212	-649	65
6	120	0	272	0	9	392	1,488	79	1,567	1,567	103,130	1,436	103,648	-518	52
7	120	0	261	0	10	381	1,499	85	1,584						
8	120	0	260	0	11	380	1,500	79	1,579						
MONTAGUE DESIGN RATE = 1,750 CFS OCTOBER 12-18, 1,655 CFS OCTOBER 19-31*															
9	0	0	261	66	12	327	1,423		1,423						
10	0	0	253	68	13	321	1,429		1,429						
11	120	0	262	8	14	390	1,360		1,360						
12	120	0	290	0	15	410	1,340		1,340						
13	120	0	291	0	16	411	1,339		1,339						
14	120	0	290	0	17	410	1,340		1,340						
15	120	0	278	0	18	398	1,352		1,352						
16	0	0	279	148	19	427	1,228		1,228						
17	0	0	267	164	20	431	1,224		1,224						
18	0	0	280	70	21	350	1,305		1,305						
19	0	0	306	0	22	306	1,349		1,349						
20	0	0	278	0	23	278	1,377		1,377						
21	0	0	296	0	24	296	1,359		1,359						
22	0	0	288	2	25	290	1,365		1,365						
23	0	0	264	673	26	937	718		718						
24	0	0	255	3,262	27	3,517	0		0						
25	0	0	267	5,328	28	5,595	0		0						
26	0	0	2,126	427	29	2,553	0		0						
27	0	0	1,514	477	30	1,991	0		0						
28	0	0	1,144	30	31	1,174	481		481						
Total	2,037	0	12,803	11,076		25,916	35,565		36,296						

*Releases designed on basis of Delaware River Basin Commission Resolution No. 80-20 Oct. 19-31.

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 precipitation forecasts.
Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = 1,880 Oct. 1-11; 1,750 Oct. 12-18; or 1,655 Oct. 19-31 - Col. 5, except total.
Col. 7 = Col. 14 (4 days earlier).
Col. 8 = Col. 6 + Col. 7, when positive and/or Col. 5 is equal to design rate or less; otherwise Col. 8 = 0.
Col. 9 = Col. 8.
Col.10 = Summation of Col. 9.
Col.11 = 1,880 - (Col. 9 + Col. 10 from Table 8).
Col.12 = Summation of Col. 11.
Col.14 = Col. 13 divided by minus 10.

Table 9b. - New York City Reservoir release design data - continued

(River Master daily operation record)

Date of advance estimate	Advance estimate of discharge of Delaware River at Montague exclusive of New York City reservoir releases: Powerplant release forecasts: Lake Wallenpaupack	Powerplant release forecasts: Mongaup Reservoir	Present conditions	Weather adjustment	Date	Discharge	Indicated deficiency	Balancing adjustment	Directed release	Computations for balancing adjustment: Directed release		Actual deficiency		Cumulative difference Col. 10 - Col. 12	Balancing adjustment
	cfs	cfs	cfs	cfs		cfs	cfs	cfs	cfs	cfs		cfs		cfs-days	cfs
1980	1	2	3	4		5	6	7	8	9	10	11	12	13	14
						MONTAGUE DESIGN RATE = 1,655 CFS NOVEMBER 1-20, 1,560 CFS NOVEMBER 21-30*									
Oct. 29	0	0	916	24	Nov. 1	940	715		715						
30	0	0	791	0	2	791	864		864						
31	0	0	686	0	3	686	969		969						
Nov. 1	0	0	582	0	4	582	1,073		1,073						
2	0	0	569	0	5	569	1,086		1,086						
3	0	0	526	41	6	567	1,088		1,088						
4	0	0	499	36	7	535	1,120		1,120						
5	0	0	453	0	8	453	1,202		1,202						
6	0	0	429	15	9	444	1,211		1,211						
7	0	0	459	166	10	625	1,030		1,030						
8	0	0	499	150	11	649	1,006		1,006						
9	0	0	497	76	12	573	1,082		1,082						
10	0	0	626	4	13	630	1,025		1,025						
11	0	0	638	0	14	638	1,017		1,017						
12	0	0	636	25	15	661	994		994						
13	0	0	634	87	16	721	934		934						
14	0	0	584	76	17	660	995		995						
15	240	0	542	0	18	782	873		873						
16	240	0	515	24	19	779	876		876						
17	240	0	493	163	20	896	759		759						
18	240	0	480	223	21	943	617		617						
19	240	0	562	227	22	1,029	531		531						
20	0	0	533	217	23	750	810		810						
21	0	0	475	318	24	793	767		767						
22	240	0	654	352	25	1,246	314		314						
23	240	0	577	227	26	1,044	516		516						
24	240	0	631	1,148	27	2,019	0		0						
25	240	0	4,655	0	28	4,895	0		0						
26	240	0	2,778	1,314	29	4,332	0		0						
27	0	0	2,395	192	30	2,587	0		0						
Total	2,400	0	25,314	5,105		32,819	23,474		23,474						

*Releases designed on basis of Delaware River Basin Commission Resolution No. 80-20 Nov. 1-20 and Resolution No. 80-24 Nov. 21-30.

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 precipitation forecasts.

Col. 5 = Col. 1 + Col. 2 + Col. 3 + Col. 4.
Col. 6 = 1,655 Nov. 1-20 or 1,560 Nov. 21-30 - Col. 5, except total.
Col. 8 = Col. 6 + Col. 7, when positive and/or Col. 5 is equal to design rate or less; otherwise Col. 8 = 0.

Table 10. - Diversions to New York City water supply

Million gallons per day for 24-hour period beginning 0900 local time

(River Master daily operation record)

Date 1979	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 1979 to date	Date 1980	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 1979 to date
Dec. 1	453	0	129	734	Jan. 1	451	499	139	748
2	453	0	83	733	2	451	498	144	749
3	453	0	174	732	3	452	499	187	751
4	452	366	106	733	4	450	499	123	752
5	452	497	180	735	5	449	498	95	754
6	453	497	141	737	6	449	498	128	755
7	453	152	150	737	7	99	71	222	754
8	453	0	159	736	8	0	0	174	751
9	453	0	170	736	9	0	0	173	748
10	452	0	164	735	10	0	0	109	746
11	448	0	121	734	11	0	0	141	743
12	454	0	67	733	12	0	0	94	740
13	449	0	166	733	13	0	0	30	737
14	449	0	165	732	14	0	406	117	736
15	448	0	106	731	15	0	498	100	735
16	448	0	208	731	16	0	498	100	735
17	449	0	200	730	17	0	498	105	734
18	453	0	180	730	18	0	498	163	734
19	453	0	196	729	19	0	499	161	733
20	450	0	152	729	20	0	499	232	733
21	450	457	152	730	21	0	498	176	733
22	450	497	88	732	22	0	498	100	733
23	450	497	37	733	23	0	498	180	732
24	453	498	89	735	24	0	498	153	732
25	453	498	75	736	25	0	498	128	732
26	451	498	134	738	26	0	498	107	731
27	452	498	139	739	27	0	498	116	731
28	453	498	146	741	28	0	497	121	730
29	453	499	140	743	29	0	497	105	730
30	454	498	131	744	30	0	497	114	729
31	451	498	144	746	31	0	497	113	729
Total	13,998	6,948	4,292		Total	2,801	11,932	4,150	

Table 10. - Diversions to New York City water supply

Million gallons per day for 24-hour period beginning 0900 local time

(River Master daily operation record)

Date 1980	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 1979 to date	Date 1980	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 1979 to date
Feb. 1	0	498	94	728	Mar. 1	452	176	94	720
2	0	498	65	727	2	452	175	85	720
3	0	497	43	727	3	452	281	68	720
4	0	498	116	726	4	445	286	79	720
5	0	498	91	726	5	456	286	70	721
6	19	437	83	725	6	450	287	71	721
7	0	498	98	724	7	449	287	60	721
8	0	498	100	724	8	449	286	51	721
9	0	498	90	723	9	448	286	98	722
10	0	497	74	723	10	453	287	81	722
11	0	497	82	722	11	451	288	79	722
12	0	497	88	722	12	451	288	77	723
13	0	497	94	721	13	451	288	70	723
14	0	497	109	721	14	451	288	72	723
15	0	497	88	720	15	451	287	74	724
16	0	498	85	720	16	452	287	73	724
17	0	497	100	719	17	451	287	78	724
18	136	497	88	719	18	453	288	72	725
19	453	205	100	719	19	449	386	67	725
20	375	177	100	719	20	449	405	44	726
21	452	177	111	719	21	398	178	0	725
22	449	177	90	719	22	0	0	0	723
23	449	176	105	719	23	0	0	0	720
24	449	176	115	719	24	0	0	0	718
25	454	176	110	719	25	344	0	0	717
26	452	176	114	719	26	441	0	0	716
27	452	176	103	720	27	450	0	0	715
28	453	176	50	719	28	450	0	0	714
29	452	176	168	720	29	450	0	0	713
					30	451	0	0	712
					31	452	0	0	711
Total	5,045	10,862	2,754		Total	12,451	5,907	1,463	

Table 10. - Diversions to New York City water supply

Million gallons per day for 24-hour period beginning 0900 local time

(River Master daily operation record)

Date 1980	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 1979 to date	Date 1980	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 1979 to date
Apr. 1	335	0	0	710	May 1	410	0	245	691
2	337	0	0	709	2	412	0	234	691
3	0	0	51	707	3	411	0	233	691
4	0	0	329	706	4	410	0	266	691
5	0	0	340	704	5	411	0	210	691
6	0	0	350	703	6	410	0	193	691
7	424	0	341	704	7	411	0	148	690
8	448	0	344	704	8	410	0	148	690
9	451	0	349	704	9	408	0	145	689
10	0	0	0	702	10	408	0	155	689
11	0	0	335	701	11	410	0	142	689
12	0	0	344	700	12	410	491	0	689
13	0	0	339	698	13	410	499	0	690
14	9	0	340	697	14	411	498	0	690
15	118	0	336	697	15	407	493	0	691
16	0	0	454	696	16	326	497	0	691
17	0	0	458	695	17	408	498	0	692
18	0	0	459	694	18	410	498	0	693
19	0	0	462	694	19	408	498	157	694
20	0	0	462	693	20	409	497	135	695
21	370	0	168	692	21	408	493	158	696
22	411	0	174	692	22	410	496	160	697
23	409	0	309	692	23	410	344	146	697
24	411	0	199	692	24	410	295	157	698
25	410	0	260	692	25	410	295	159	698
26	393	0	231	692	26	383	295	153	699
27	411	0	255	692	27	408	294	167	699
28	410	0	269	692	28	409	477	162	700
29	410	0	242	691	29	406	498	159	701
30	411	0	248	691	30	408	117	160	701
					31	407	0	148	701
Total	6,168	0	8,448		Total	12,579	8,073	4,140	

Table 10. - Diversions to New York City water supply

Million gallons per day for 24-hour period beginning 0900 local time

(River Master daily operation record)

Date 1980	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 1980 to date	Date 1980	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 1980 to date
June 1	408	0	160	568	July 1	410	226	166	750
2	409	0	156	566	2	411	226	156	751
3	410	0	152	565	3	410	186	155	751
4	408	180	156	610	4	412	176	148	751
5	410	179	158	637	5	411	175	163	751
6	410	178	153	654	6	410	175	171	751
7	410	177	133	664	7	411	175	150	750
8	410	177	143	672	8	411	175	156	750
9	410	177	131	677	9	410	175	138	749
10	410	177	155	684	10	410	175	162	749
11	410	177	150	689	11	410	175	78	747
12	410	178	150	693	12	410	175	122	746
13	410	217	130	698	13	410	175	134	746
14	412	229	154	705	14	410	173	143	745
15	412	229	148	710	15	411	0	209	742
16	410	228	145	715	16	410	0	228	740
17	410	229	154	719	17	410	0	231	738
18	402	228	143	722	18	410	0	201	735
19	410	228	144	725	19	410	0	213	733
20	410	227	148	728	20	410	0	210	731
21	410	227	160	732	21	396	0	211	728
22	410	227	157	735	22	409	0	193	726
23	411	227	150	737	23	410	0	173	723
24	411	228	143	739	24	410	0	192	721
25	410	227	157	741	25	410	0	193	719
26	410	227	142	742	26	410	0	174	716
27	410	226	159	744	27	410	0	204	715
28	410	226	143	746	28	410	0	187	713
29	410	225	150	747	29	411	0	201	711
30	410	225	140	748	30	410	0	197	709
					31	410	0	197	708
Total	12,293	5,680	4,464		Total	12,703	2,562	5,456	

Table 10. - Diversions to New York City water supply

Million gallons per day for 24-hour period beginning 0900 local time

(River Master daily operation record)

Date 1980	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 1980 to date	Date 1980	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	Average June 1, 1980 to date
Aug. 1	389	0	199	706	Sept. 1	411	0	158	673
2	411	0	217	704	2	411	0	166	672
3	411	0	220	703	3	411	0	166	671
4	411	0	221	702	4	410	0	155	670
5	410	0	214	701	5	411	0	161	669
6	411	0	200	700	6	410	0	166	668
7	411	0	202	698	7	410	0	149	667
8	411	0	203	697	8	410	0	114	665
9	412	0	196	696	9	424	0	104	664
10	411	0	204	695	10	411	0	108	663
11	408	0	252	694	11	411	0	120	661
12	410	0	236	694	12	411	0	108	660
13	411	0	0	690	13	412	0	97	659
14	411	0	29	686	14	411	0	109	657
15	410	0	261	686	15	409	0	99	656
16	410	0	264	686	16	404	0	139	655
17	409	0	251	686	17	411	158	112	655
18	411	0	216	685	18	410	166	106	655
19	411	0	211	684	19	411	166	103	655
20	410	0	227	684	20	411	166	101	656
21	411	0	207	683	21	410	166	157	656
22	410	0	200	682	22	411	166	112	657
23	411	0	212	681	23	410	166	112	657
24	411	0	210	680	24	410	166	36	657
25	410	6	203	680	25	409	166	109	657
26	411	3	219	679	26	412	24	109	656
27	411	0	207	679	27	412	0	103	655
28	411	0	213	678	28	412	0	108	654
29	411	0	146	677	29	411	134	108	654
30	410	0	152	675	30	411	166	101	654
31	411	0	154	674					
Total	12,707	9	6,146		Total	12,328	1,810	3,596	

Table 10.- Diversions to New York City water supply

Million gallons per day for 24-hour period beginning 0900 local time

(River Master daily operation record)

Date 1980	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	*Average June 1 - Oct. 17 or Oct. 18 - Nov. 19	Date 1980	East Delaware Tunnel	West Delaware Tunnel	Neversink Tunnel	*Average Oct. 18 - Nov. 19or Nov. 20 - 30
Oct. 1	411	166	141	654	Nov. 1	412	163	160	612
2	394	166	112	654	2	412	163	150	619
3	302	165	82	654	3	412	197	163	628
4	407	165	126	654	4	413	204	183	638
5	407	165	83	654	5	410	52	152	636
6	408	165	107	654	6	410	0	165	633
7	413	165	135	655	7	410	0	162	630
8	410	165	143	655	8	409	0	150	627
9	471	378	247	658	9	409	0	142	624
10	475	463	335	663	10	412	0	174	622
11	475	463	323	668	11	412	0	166	620
12	474	463	314	672	12	410	234	165	628
13	474	462	304	676	13	411	267	168	636
14	473	457	395	681	14	410	73	170	636
15	472	457	377	685	15	410	0	169	634
16	430	456	369	690	16	410	0	166	632
17	407	111	341	691	17	410	120	180	635
18	407	0	300	707	18	409	161	127	637
19	406	0	271	692	19	410	44	137	635
20	406	0	161	650	20	410	0	99	509
21	408	0	163	630	21	410	0	99	509
22	411	0	186	624	22	410	0	139	522
23	410	0	177	618	23	410	0	103	520
24	411	0	135	607	24	364	0	112	511
25	429	0	174	607	25	406	0	98	510
26	411	0	179	605	26	405	0	73	505
27	412	0	184	604	27	405	0	106	506
28	413	0	192	604	28	406	0	85	504
29	410	0	128	599	29	407	0	99	505
30	408	0	168	597	30	407	0	110	506
31	412	129	142	603					
Total	13,057	5,161	6,494		Total	12,241	1,678	4,172	

*Average of combined diversions under Section III A 3 of Amended Decree to October 17. Beginning October 18, average was computed by periods specified in Delaware River Basin Commission Resolutions agreed to by parties to the Decree.

Table 11. - Storage in Pepacton Reservoir, N.Y., for year ending November 30, 1980

(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.)

(River Master daily operation record; gage reading at 0900)

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	112,975	109,218	111,629	107,928	131,274	141,098	135,149	125,211	114,628	102,008	86,137	67,103
2	113,255	108,975	111,694	107,460	131,952	141,024	134,823	125,107	114,230	101,539	85,528	66,375
3	113,437	108,830	111,727	106,964	132,523	140,931	134,498	124,881	113,948	101,195	85,004	65,641
4	113,552	108,572	111,743	106,596	133,401	140,801	134,175	124,656	113,717	100,730	84,679	64,728
5	113,503	108,331	111,711	106,196	134,624	140,672	133,797	124,326	113,305	100,311	84,089	63,978
6	113,536	108,057	111,743	105,780	135,584	140,560	133,419	124,257	112,909	100,094	83,485	63,222
7	113,503	107,766	111,760	105,431	136,454	140,486	133,186	123,980	112,464	99,722	82,900	62,493
8	113,420	107,895	111,825	105,209	137,037	140,412	132,916	123,670	112,054	99,444	82,357	61,746
9	113,272	107,992	111,842	106,020	137,439	140,283	132,577	123,429	111,613	98,998	81,678	60,980
10	113,107	108,137	111,874	106,068	139,528	140,172	132,273	123,136	111,122	98,445	80,919	60,287
11	112,926	108,282	111,923	105,972	141,301	140,043	131,916	122,826	110,713	97,847	80,206	59,624
12	112,728	108,766	111,989	105,717	141,709	139,914	131,524	122,464	110,274	97,268	79,455	58,928
13	112,530	108,975	111,989	105,526	141,765	139,767	131,113	122,121	109,868	96,719	78,681	58,248
14	112,365	109,218	112,022	105,368	141,654	139,730	130,706	121,711	109,446	96,053	77,775	57,549
15	112,152	109,462	112,071	105,050	141,709	139,657	130,298	121,403	109,088	95,479	76,944	56,830
16	111,907	109,641	112,152	104,796	141,691	139,491	130,015	120,992	108,669	94,920	76,250	56,275
17	111,629	109,836	112,201	104,526	141,617	139,326	129,643	120,582	108,282	94,306	75,440	55,484
18	111,383	110,030	112,234	106,564	141,487	139,123	129,271	120,157	107,863	93,827	74,597	54,922
19	111,154	110,225	112,136	108,331	141,394	138,976	128,831	119,750	107,316	93,259	73,849	54,429
20	110,876	110,355	111,743	109,056	141,301	138,811	128,444	119,308	106,852	92,665	73,029	53,916
21	110,566	110,518	111,433	109,868	141,191	138,553	128,057	118,833	106,452	92,012	72,227	53,194
22	110,274	110,648	111,056	117,636	140,839	138,369	127,688	118,614	106,004	91,320	71,429	52,520
23	109,982	110,811	110,648	121,505	140,635	138,114	127,303	118,277	105,558	90,746	70,690	52,113
24	109,787	110,974	110,274	123,567	140,449	137,840	126,849	117,889	105,098	90,161	70,104	51,620
25	109,738	110,991	109,900	125,818	140,338	137,530	126,395	117,484	104,653	89,621	69,688	52,354
26	109,771	111,138	109,494	126,936	140,246	137,165	125,975	117,081	104,224	89,068	69,776	52,928
27	109,738	111,220	109,072	127,653	140,098	136,855	125,610	116,663	103,783	88,504	69,675	53,194
28	109,608	111,351	108,717	128,110	139,969	136,544	125,072	116,211	103,342	87,883	69,411	53,370
29	109,543	111,433	108,282	128,708	140,653	136,218	124,639	115,792	102,885	87,309	69,084	53,748
30	109,462	111,514		129,660	141,042	135,856	125,003	115,459	102,477	86,709	68,570	53,927
31	109,348	111,580		130,529		135,511		115,044	102,399		67,884	
Change	-3,199	+2,232	-3,298	+22,247	+10,513	-5,531	-10,508	-9,959	-12,645	-15,690	-18,825	-13,957
Equiv. mgd	-103.2	+72.0	-113.7	+717.6	+350.4	-178.4	-350.3	-321.3	-407.9	-523.0	-607.3	-465.2
Equiv. cfs	-160	+111	-176	+1,110	+542	-276	-542	-497	-631	-809	-939	-720

Change for year -58,620 million gallons Equiv. for year -160.2 mgd Equiv. for year -248 cfs

Table 12. - Storage in Cannonsville Reservoir, N.Y., for year ending November 30, 1980

(Storage in millions of gallons above elevation 1,040.00 ft. Add 2,584 million gallons for total contents above sill of outlet tunnel, elevation 1,020.50 ft.)

(River Master daily operation record; gage reading at 0900)

Day	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	97,379	95,113	88,146	71,106	99,456	98,233	90,990	75,928	66,185	51,732	37,549	22,793
2	97,556	94,930	87,378	70,576	99,215	98,168	90,716	75,638	65,510	51,441	36,687	22,639
3	97,605	94,733	86,771	70,059	98,957	98,056	90,792	75,320	64,950	51,091	35,776	22,422
4	97,540	94,459	86,178	69,397	98,667	97,878	90,686	75,044	64,924	50,624	34,884	22,121
5	97,154	94,155	85,398	68,907	98,732	97,701	90,229	74,727	64,784	50,181	34,042	21,765
6	96,736	93,850	84,704	68,563	98,667	97,524	89,682	74,533	64,695	49,585	33,250	21,633
7	96,430	93,470	84,024	68,006	98,490	97,428	89,210	74,257	64,542	49,049	32,407	21,448
8	96,510	93,561	83,114	67,940	98,297	97,299	89,119	74,036	64,287	48,681	31,536	21,308
9	96,623	93,729	82,319	69,622	98,217	97,186	88,800	73,768	63,803	48,125	30,710	21,215
10	96,687	93,911	81,596	70,682	98,828	97,090	88,465	73,477	63,332	47,669	29,644	21,169
11	96,704	93,896	80,833	71,026	99,182	96,993	88,298	73,119	63,179	47,180	28,634	21,161
12	96,704	94,337	80,156	71,265	99,038	96,929	88,176	72,496	62,976	46,613	27,681	21,130
13	96,720	94,717	79,493	71,305	98,812	96,478	87,782	72,059	62,670	45,923	26,762	20,798
14	96,752	94,946	78,761	71,358	98,603	96,253	87,031	71,715	62,403	45,312	25,749	20,512
15	96,704	94,915	77,890	71,318	98,522	96,028	86,482	71,384	61,932	45,134	24,779	20,512
16	96,655	94,748	77,089	71,252	98,619	95,770	86,077	71,252	61,256	44,834	23,776	20,505
17	96,607	94,489	76,343	71,252	98,506	95,523	85,658	71,080	60,793	44,578	22,863	20,512
18	96,591	94,246	75,624	73,092	98,329	95,250	85,123	70,868	60,427	44,144	22,592	20,421
19	96,527	93,957	74,892	75,818	98,152	94,961	84,574	70,377	60,024	43,622	22,345	20,336
20	96,478	93,683	74,630	76,979	97,959	94,717	83,981	69,940	59,572	42,815	21,966	20,301
21	96,462	93,364	74,271	78,222	97,814	94,413	82,955	69,688	59,120	42,153	21,610	20,385
22	96,028	93,059	73,848	83,388	97,637	94,109	82,174	69,596	58,436	41,827	21,277	20,400
23	95,786	92,770	73,728	88,435	97,476	93,790	81,568	69,450	57,753	41,512	20,922	20,470
24	95,523	92,299	73,596	90,868	97,379	93,653	80,750	69,278	56,886	41,123	20,491	20,543
25	95,432	91,675	73,477	93,303	97,251	93,501	79,907	68,868	56,263	40,692	20,470	21,502
26	95,554	91,142	73,146	95,341	97,154	93,318	79,161	68,205	55,628	40,325	21,254	22,902
27	95,554	90,747	72,708	96,607	97,074	93,059	78,360	67,715	54,932	39,705	22,020	23,822
28	95,478	90,351	72,218	97,508	97,058	92,816	77,351	67,397	54,264	39,169	22,469	24,532
29	95,417	89,956	71,623	98,056	97,637	92,131	76,495	67,217	53,494	38,927	22,809	25,468
30	95,341	89,347		99,005	98,184	91,431	76,067	66,860	52,712	38,444	22,809	26,345
31	95,250	88,876		99,408		91,218		66,631	52,211		22,909	
Change	-1,470	-6,374	-17,253	+27,785	-1,224	-6,966	-15,151	-9,436	-14,420	-13,767	-15,535	+3,436
Equiv.mgd	-47.4	-205.6	-594.9	+896.3	-40.8	-224.7	-505.0	-304.4	-465.2	-458.9	-501.1	+114.5
Equiv. cfs	-73.3	-318	-920	+1,387	-63.1	-348	-781	-471	-720	-710	-775	+177

Change for year -70,375 million gallons Equiv. for year -192.3 mgd Equiv. for year -297 cfs

Table 13. - Storage in Neversink Reservoir, N.Y. for year ending November 30, 1980

(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.)

(River Master daily operation record; gage reading at 0900)

	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.
1	26,834	25,900	23,385	20,923	31,550	33,586	32,056	28,522	23,557	17,192	13,087	6,659
2	26,894	25,854	23,321	20,840	31,803	33,567	31,930	28,420	23,353	16,999	12,930	6,506
3	26,970	25,787	23,238	20,738	32,028	33,509	31,803	28,311	23,230	16,816	12,804	6,366
4	26,945	25,654	23,187	20,682	32,226	33,427	31,686	28,193	23,036	16,628	12,710	6,195
5	26,958	25,587	23,091	20,607	32,359	33,297	31,541	28,062	22,823	16,454	12,563	6,030
6	26,915	25,553	22,996	20,551	32,302	33,216	31,392	27,996	22,607	16,288	12,456	5,885
7	26,898	25,470	22,909	20,480	32,189	33,153	31,294	27,892	22,412	16,106	12,329	5,711
8	26,872	25,308	22,823	20,462	32,061	33,105	31,215	27,762	22,213	15,939	12,190	5,558
9	26,808	25,180	22,736	20,462	31,991	33,062	31,113	27,641	21,984	15,807	12,006	5,407
10	26,736	25,052	22,658	20,439	33,698	33,019	31,007	27,503	21,757	15,681	11,762	5,280
11	26,663	24,973	22,595	20,383	34,611	32,943	30,864	27,361	21,550	15,557	11,402	5,125
12	26,629	24,965	22,513	20,342	34,724	32,886	30,735	27,296	21,298	15,428	11,068	4,961
13	26,650	24,994	22,431	20,287	34,754	32,962	30,597	27,180	21,044	15,306	10,734	4,798
14	26,578	25,043	22,349	20,268	34,734	33,043	30,478	27,047	21,017	15,184	10,410	4,636
15	26,490	24,998	22,252	20,194	34,872	33,115	30,341	26,906	21,010	15,060	10,012	4,470
16	26,447	24,965	22,186	20,146	35,090	33,187	30,222	26,710	20,727	14,933	9,623	4,298
17	26,380	24,924	22,116	20,087	34,906	33,225	30,113	26,485	20,465	14,781	9,248	4,137
18	26,223	24,875	22,004	20,708	34,699	33,273	29,959	26,257	20,194	14,668	8,858	3,991
19	26,110	24,776	21,926	21,469	34,468	33,417	29,819	26,034	19,965	14,542	8,566	3,867
20	25,992	24,670	21,841	21,699	34,189	33,379	29,688	25,808	19,741	14,427	8,306	3,735
21	25,883	24,482	21,761	21,915	33,911	33,312	29,553	25,578	19,507	14,312	8,133	3,639
22	25,804	24,336	21,672	27,775	33,877	33,225	29,396	25,420	19,286	14,141	7,961	3,546
23	25,779	24,279	21,592	28,645	33,828	33,129	29,244	25,283	19,073	14,009	7,767	3,408
24	25,808	24,161	21,512	29,029	33,635	33,033	29,093	25,110	18,850	13,877	7,578	3,321
25	25,871	24,003	21,416	29,450	33,538	32,924	28,933	24,920	18,625	13,816	7,445	3,501
26	26,081	23,926	21,321	29,715	33,374	32,805	28,760	24,723	18,405	13,716	7,461	3,648
27	26,102	23,850	21,218	29,923	33,225	32,686	28,588	24,543	18,179	13,583	7,411	3,679
28	26,076	23,765	21,139	30,118	33,115	32,557	28,429	24,340	17,945	13,457	7,261	3,675
29	26,076	23,681	21,097	30,373	33,341	32,429	28,272	24,149	17,712	13,337	7,102	3,721
30	26,005	23,585		30,855	33,562	32,292	28,491	23,963	17,556	13,206	6,971	3,761
31	25,959	23,501		31,253		32,165		23,757	17,377		6,805	
Change	-781	-2,458	-2,404	+10,156	+2,309	-1,397	-3,674	-4,734	-6,380	-4,171	-6,401	-3,044
Equiv. mgd	-25.2	-79.3	-82.9	+327.6	+77.0	-45.1	-122.5	-152.7	-205.8	-139.0	-206.5	-101.5
Equiv. cfs	-39.0	-123	-128	+507	+119	-69.8	-190	-236	-318	-215	-319	-157

Change for year -22,979 million gallons Equiv. for year -62.8 mgd Equiv. for year -97.2 cfs

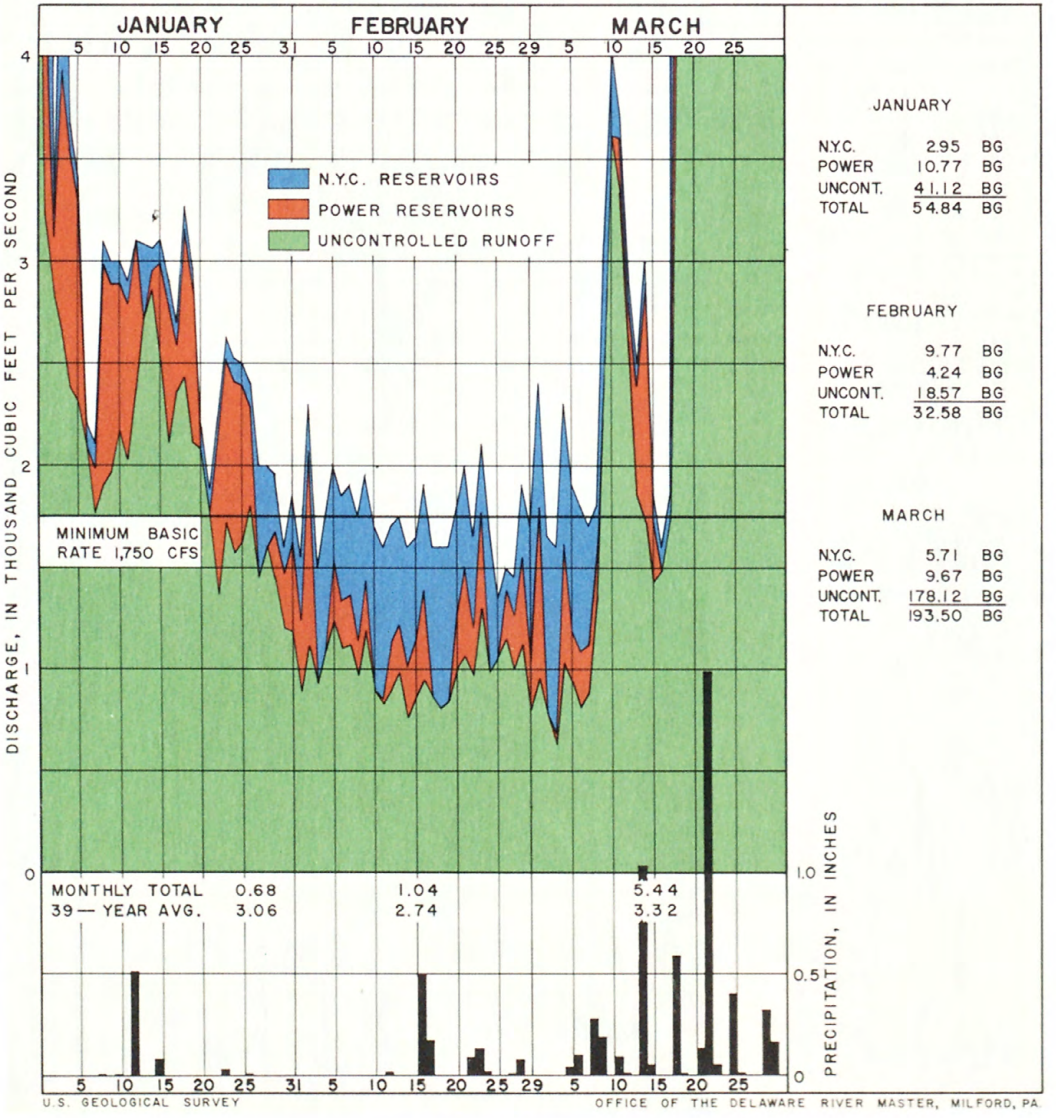
Table 14. - NEW YORK CITY CONSUMPTION OF WATER - 1940 to 1980

Year	Consumption in City proper Mgd	Gallons per capita per day	Furnished to outside communities mgd	Total mgd	Annual billion gallons
1940	922.7	124	21.6	944.3	345.614
41	964.2	130	24.8	989.0	360.985
42	906.7	124	21.5	928.2	338.793
43	942.7	133	21.5	964.2	351.933
44	1,004.9	144	26.5	1,031.4	377.492
1945	1,056.2	146	22.0	1,078.2	393.543
46	1,117.1	146	24.1	1,141.2	416.538
47	1,159.0	149	30.4	1,189.4	434.131
48	1,172.3	150	31.5	1,203.8	440.591
49	1,166.9	149	36.2	1,203.1	439.132
1950	953.3	121	29.1	982.4	358.576
51	1,041.9	131	28.1	1,070.0	390.550
52	1,087.0	136	32.7	1,119.7	409.810
53	1,093.9	135	44.6	1,138.5	415.552
54	1,063.4	131	46.3	1,109.7	405.040
1955	1,109.9	136	45.3	1,155.2	421.648
56	1,111.3	136.2	48.9	1,160.2	424.633
57	1,169.0	143	57.2	1,226.2	447.563
58	1,152.9	140.8	49.6	1,202.5	438.912
59	1,204.3	146.8	60.3	1,264.6	461.579
1960	1,199.4	153.9	58.9	1,258.3	460.529
61	1,221.0	156.0	64.0	1,285.0	469.022
62	1,207.6	153.5	68.8	1,276.4	465.896
63	1,218.0	154.1	76.7	1,294.7	472.582
64	1,189.2	149.8	79.4	1,268.6	464.295
1965	1,052.1	131.9	71.2	1,123.3	409.995
66	1,044.9	130.4	73.2	1,118.1	408.128
67	1,135.3	141.0	71.0	1,206.3	440.302
68	1,242.0	153.6	78.2	1,320.2	483.175
69	1,328.7	163.5	80.1	1,408.8	514.229
1970	1,400.3	177.9	90.4	1,490.7	544.116
71	1,423.6	180.0	87.9	1,511.5	551.695
72	1,412.4	178.3	83.0	1,495.4	547.340
73	1,448.9	182.7	95.4	1,544.3	563.681
74	1,441.8	181.5	96.3	1,538.1	561.409
1975	1,415.0	177.9	92.1	1,507.1	550.093
76	1,435.0	180.1	95.8	1,530.8	560.264
77	1,483.0	185.9	104.7	1,587.7	579.510
78	1,479.4	185.1	103.0	1,582.4	577.566
79	1,513.0	189.0	104.6	1,617.6	590.426
1980	1,506.3	187.9	110.0	1,616.3	591.582

Data furnished by
New York City
Department of Environmental Protection
Bureau of Water Supply

PLATE I.—COMPONENTS OF FLOW
DELAWARE RIVER AT MONTAGUE, N.J.

1980



JANUARY

N.Y.C.	2.95	BG
POWER	10.77	BG
UNCONT.	41.12	BG
TOTAL	54.84	BG

FEBRUARY

N.Y.C.	9.77	BG
POWER	4.24	BG
UNCONT.	18.57	BG
TOTAL	32.58	BG

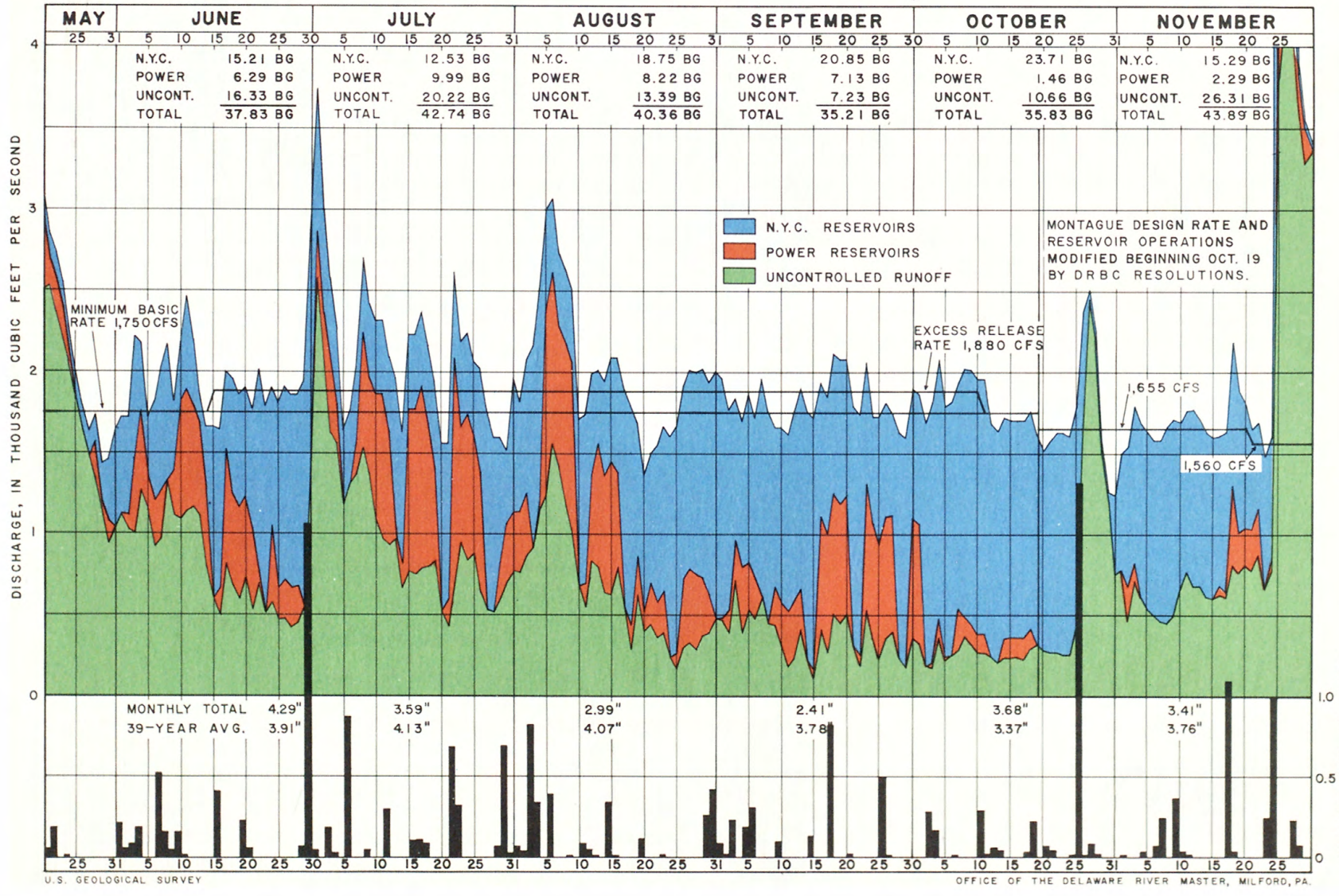
MARCH

N.Y.C.	5.71	BG
POWER	9.67	BG
UNCONT.	178.12	BG
TOTAL	193.50	BG

U.S. GEOLOGICAL SURVEY

OFFICE OF THE DELAWARE RIVER MASTER, MILFORD, PA.

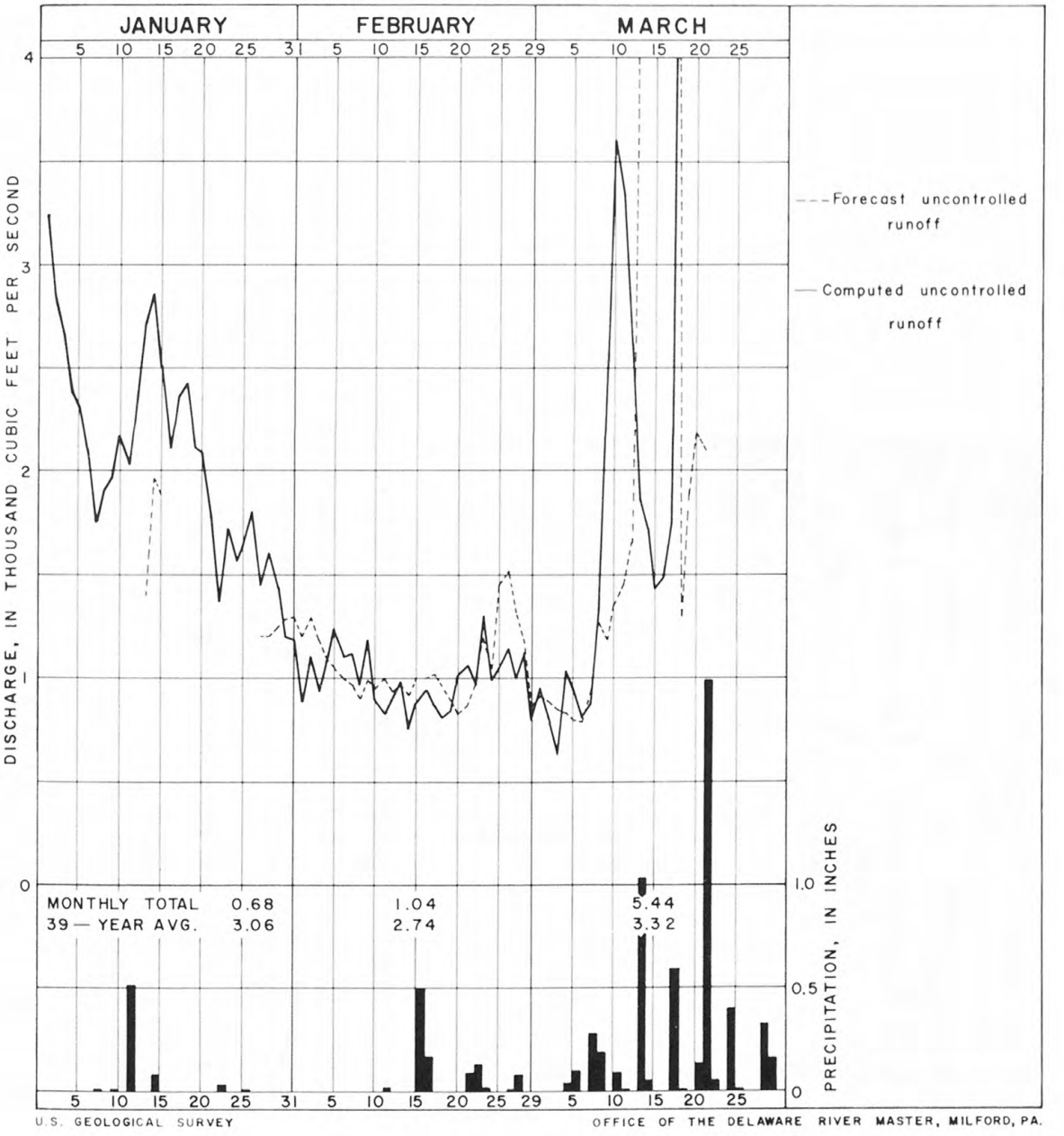
PLATE 2.–COMPONENTS OF FLOW, DELAWARE RIVER AT MONTAGUE, N.J. 1980



U.S. GEOLOGICAL SURVEY

OFFICE OF THE DELAWARE RIVER MASTER, MILFORD, PA.

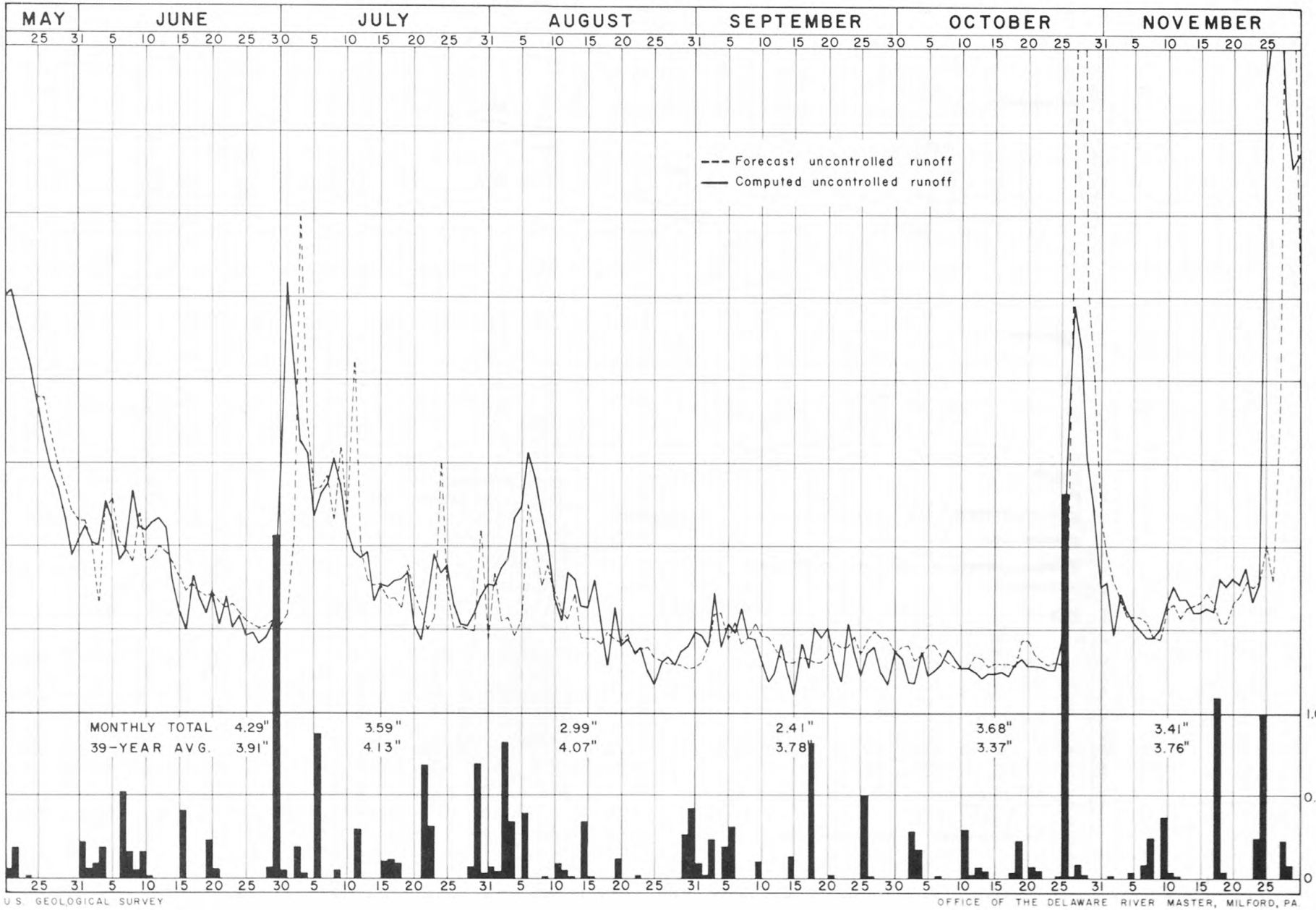
FIGURE 2—UNCONTROLLED COMPONENT,
DELAWARE RIVER AT MONTAGUE, N.J. 1980



U.S. GEOLOGICAL SURVEY

OFFICE OF THE DELAWARE RIVER MASTER, MILFORD, PA.

FIGURE 3 — UNCONTROLLED COMPONENT, DELAWARE RIVER AT MONTAGUE, N.J. 1980



U.S. GEOLOGICAL SURVEY

OFFICE OF THE DELAWARE RIVER MASTER, MILFORD, PA.

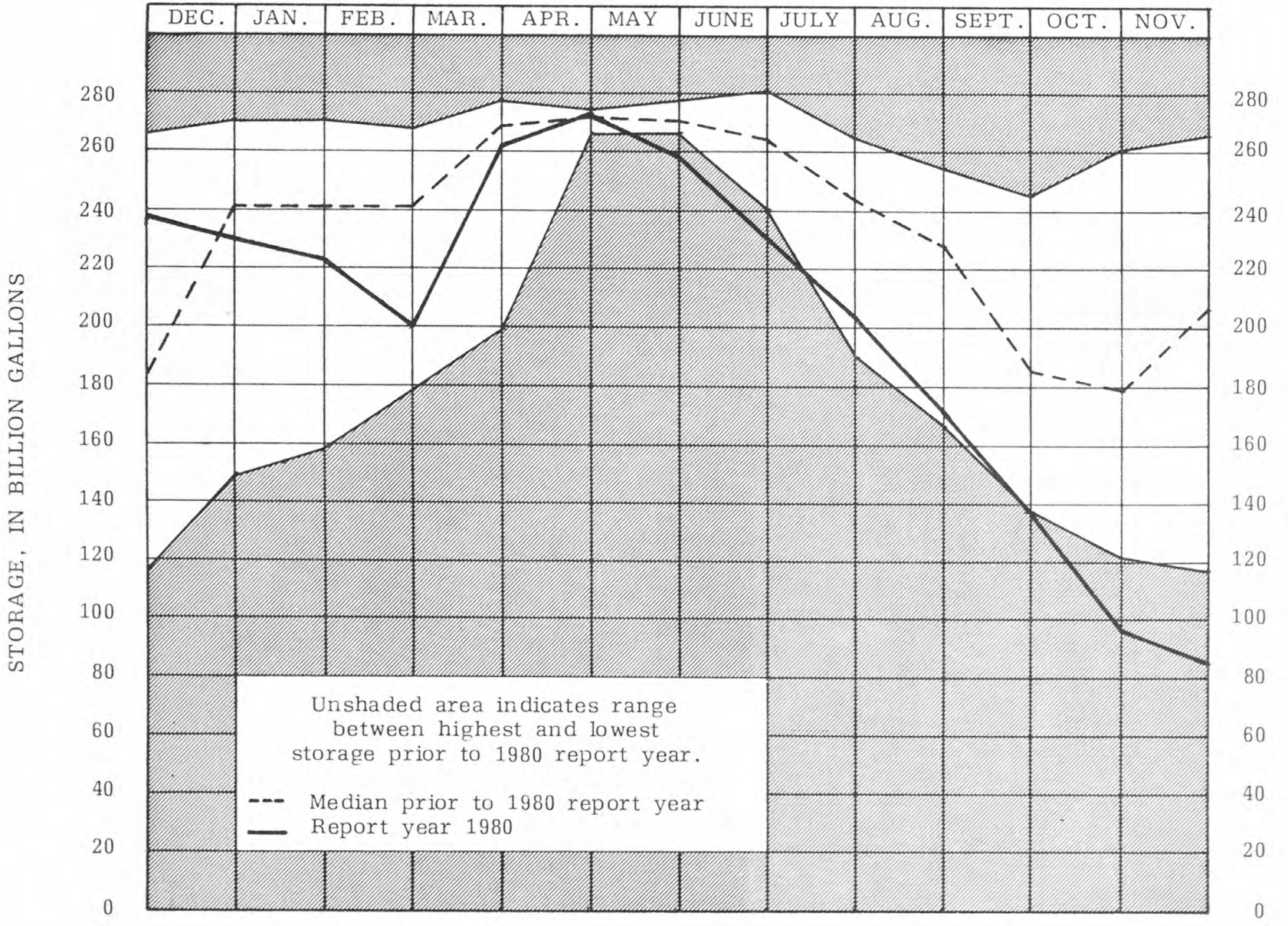
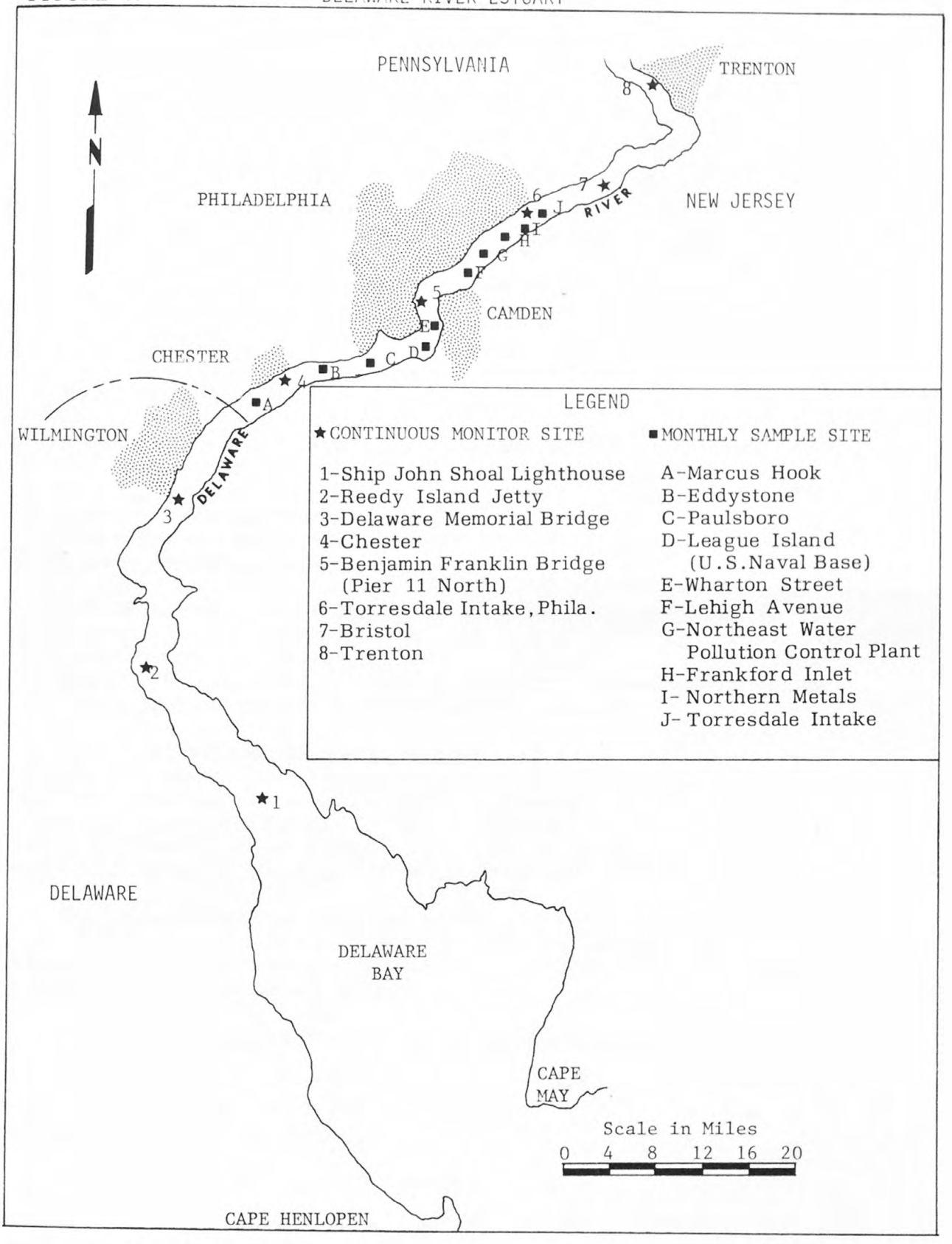


Figure 4. - Combined storage in Pepacton, Cannonsville, and Neversink Reservoirs on first day of month, June 1967 to December 1980

Section III

WATER QUALITY OF THE DELAWARE RIVER ESTUARY

FIGURE 5. DELAWARE RIVER ESTUARY



Section III

WATER QUALITY OF THE DELAWARE RIVER ESTUARY

INTRODUCTION

This section describes the water-quality monitoring program carried out by the U.S. Geological Survey in the Delaware Estuary during the 1980 report year. Also presented here are some of the data that were obtained by this program and a brief discussion of the significance of the data.

Water-Quality Monitoring Program

Water quality of the Delaware River and Estuary was monitored between Trenton, N.J., and Ship John Shoal Lighthouse, N.J. Data were acquired continuously by electronic instruments at eight monitor sites, one at Trenton, just upstream of the head of tidewater and at seven sites in the estuary (fig. 5). At Ship John Shoal Lighthouse, the water was monitored for two parameters: Temperature and specific conductance. At the remaining sites, the water was monitored for four parameters: Temperature, specific conductance, dissolved oxygen, and pH.

Additional data were obtained at ten sites between Torresdale, Pa. and Marcus Hook, Pa. on a monthly basis. At each of these sites, samples of water were collected at three points of the cross-section. These samples were analyzed for temperature, chloride, alkalinity, biochemical oxygen demand, specific conductance, dissolved oxygen, and pH.

Data obtained from the continuous monitoring sites were processed by computer and stored for future reference by the U.S. Geological Survey. They were also distributed regularly to cooperators and published annually by the U.S. Geological Survey as "Water Resources Data for Pennsylvania, Volume 1, Delaware River Basin". Data from the monthly sites were processed and stored by the City of Philadelphia Water Department.

The above-described programs were carried out in cooperation with the City of Philadelphia Water Department, Delaware Geological Survey, Delaware River Basin Commission, Delaware River Master, and other agencies of federal, state, and county governments.

Estuarine Water-Quality Data During 1980

The following is a summary and discussion of the data that were collected during the 1980 report year. Additional information can be found in the tables at the end of this section.

Streamflow

Streamflow is a vital factor in controlling the water quality of the estuary. Increased streamflow usually results in better water quality by lim-

iting salt-water intrusion and diluting the concentration of dissolved minerals, both of which contribute to a lower specific conductance and chloride level. Increased flow also aids in maintaining lower water temperature during warm weather and supporting higher dissolved-oxygen levels.

Based on streamflow records for the Delaware River at Trenton, mean monthly streamflow was lowest for the year during September (2,981 cfs) and highest for the year during April (26,610 cfs). (See table 7.) The mean monthly streamflow was above the respective median for the period of record during December and April, and below the median January through March and May through November.

Temperature

The significance of water temperature in regard to water quality in the estuary lies in its profound influence on various physical, chemical, and biological properties of the water. In general, increases in water temperature have deleterious effects on water quality by lowering the saturation level of dissolved oxygen and increasing biological activities.

The primary factors involved in controlling water temperature in the estuary are climatic; however, various uses of the water by man can also have significant effects.

Based on records from Benjamin Franklin Bridge (Pier 11 North) Philadelphia, Pa., mean monthly temperatures December 1979 to November 1980 were at or near normal (based on the period 1962 to 1972) during February and May, below normal during December, March, June, July, October and November, and above normal during January, April, August, and September. (See fig. 6.)

Specific Conductance and Chloride

Specific conductance is the ability of a solution to conduct electricity. Basically, it can be used to measure the amount of ionized material in solution and relates approximately to dissolved-solids content.

Specific conductance values in bodies of water usually reflect the geochemistry of the drainage basin; however, pollution and the intrusion of oceanic salts can also have considerable effects. Increasing streamflows reduce the concentration of dissolved solids, thus lowering specific conductance and chloride levels. Conversely, decreasing flows have the opposite effects.

In the Delaware Estuary, the intrusion of oceanic salts is important to those who must use the estuary as a water supply. For this reason, chloride concentration is of great interest. Water with chloride concentrations in excess of 250 mg/L (milligrams per liter) is usually considered undesirable for domestic use and water with concentrations in excess of 50 mg/L is unsatisfactory for some industrial uses.

As sea water has a chloride concentration of approximately 19,000 mg/L the location of a body of water in relation to the sea can influence chloride levels in that body of water. For this reason, chloride concentrations in the Delaware Estuary generally increase with distance downstream toward Delaware Bay and the Atlantic Ocean.

Chloride concentration was not measured directly at Delaware Memorial Bridge near Wilmington, Del., and Reedy Island Jetty, Del., but a correlation between specific conductance and chloride concentration has been developed based on analyses of water samples taken in the estuary. Chloride concentrations at those sites and presented in tables 16 and 17 were derived from that relationship. The relationship is less reliable when chloride concentrations are lower than 30 mg/L because other ionized materials may be present in amounts large enough to affect the conductance-chloride relationship. Therefore, chloride concentrations derived from specific conductance are not given when the relationship indicates chloride concentrations of less than 30 mg/L. Chloride concentrations at Chester, Pa. were furnished by Scott Paper Company.

During the past year, water containing more than 50 mg/L of chloride reached the Benjamin Franklin Bridge on September 16, 17, and 21, and from September 24 through October 25. The maximum recorded at this site was 95 mg/L on October 25. At Chester, the chloride concentrations equaled or exceeded 50 mg/L February 15 to March 20 and June 23 through November 30 and exceeded 250 mg/L August 20 through November 30 with a maximum of 1,360 mg/L on October 25. (See table 15.) The maximum daily chloride concentration in the estuary at Chester was greater than 50 mg/L 54 percent of the time and greater than 250 mg/L 28 percent of the time. At the Delaware Memorial Bridge, chloride levels were in excess of 250 mg/L frequently throughout the year, with a maximum of 3,640 mg/L on November 23. (See table 16.) Chloride levels in excess of 250 mg/L were recorded on most days of the year at Reedy Island Jetty (table 17) with levels in the range of 2,000 to 9,000 mg/L being common. The maximum recorded at this site was 9,780 mg/L on November 23.

Dissolved Oxygen

Dissolved oxygen is necessary in water for the respiration of aquatic organisms. It also plays a significant role in chemical reactions in aquatic environments. The major sources of dissolved oxygen in water are diffusion from the air and photosynthesis in aquatic plants. Dissolved-oxygen levels are limited by temperature, salinity, and the partial pressure of atmospheric oxygen.

Dissolved-oxygen levels in the estuary tend to be highest near Trenton and to decrease with distance downstream to a point near Chester, where minimum values are usually reached.

During the past year, mean dissolved-oxygen concentration at Bristol was below 5 mg/L on many days from July 22 through October 8. The minimum hourly value was 3.0 mg/L on September 23. At the Benjamin Frank-

lin Bridge, mean dissolved-oxygen concentration recorded was below 5 mg/L May 13 through November 25 except on October 27 and November 12 and 13. (See table 18.) The minimum hourly value was 0.0 recorded on August 1. At Delaware Memorial Bridge, the mean dissolved-oxygen concentration recorded was below 5 mg/L on many days from June 2 through September 2. (See table 19.) The lowest daily mean was 3.7 mg/L on July 4 and 5. The minimum hourly value was 2.6 mg/L on July 5. At Reedy Island Jetty, the minimum hourly value was 4.6 mg/L.

Figure 7 shows the frequency of hourly dissolved-oxygen concentration at Benjamin Franklin Bridge (Pier 11 North) and Delaware Memorial Bridge during the critical summer period, July through September. During this period, the dissolved-oxygen concentration was as high as the 5 mg/L level less than one percent of the time at the Benjamin Franklin Bridge and less than 42 percent of the time at the Delaware Memorial Bridge.

Hydrogen-Ion Concentration (pH)

Hydrogen-ion concentration (pH) is fundamentally a measure of acidity or alkalinity. pH values below 7 indicate acidity, whereas values above 7 indicate alkalinity. In natural waters, pH generally ranges from 6.0 to 8.5. The main factors controlling the pH of a body of water are usually the geo-chemistry of the drainage basin and external influences such as pollution. Photosynthetic activity can also have a considerable influence on pH values. Increased photosynthetic activity (algal bloom) produces higher pH values. Nearly all pH values at Bristol, Benjamin Franklin Bridge, Delaware Memorial Bridge, and Reedy Island Jetty were within the range of 6.0 to 8.0.

Table 15 - Chloride concentrations, Delaware River at Chester, Pa.[1/]

Daily maximum and minimum chloride concentrations in milligrams per liter

December 1, 1979 to November 30, 1980

Day	December		January		February		March		April		May		June		July		August		September		October		November	
	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	28	22	31	26	33	30	110	54	24	16	24	22	29	25	90	50	162	84	465	90	775	335	380	190
2	26	20	35	28	32	30	115	50	23	20	24	22	29	27	95	49	160	82	540	210	880	359	500	188
3	24	21	35	28	32	31	210	58	22	20	25	21	30	26	80	48	175	74	538	175	990	376	470	244
4	25	17	32	28	35	30	185	68	28	21	23	19	31	27	80	49	184	82	625	210	955	370	670	140
5	26	18	32	29	33	29	160	63	28	19	22	17	32	27	92	52	169	81	620	230	770	325	420	210
6	25	17	30	27	34	30	155	58	22	18	21	19	33	29	84	55	158	70	640	220	990	343	500	200
7	25	18	35	28	35	31	130	62	23	19	22	18	32	30	72	50	148	63	665	240	850	357	410	212
8	24	21	34	29	25	21	130	62	22	19	22	19	36	30	80	50	144	67	780	230	900	382	390	200
9	22	19	32	29	25	20	122	62	26	18	22	19	32	30	120	51	151	75	720	260	780	340	440	190
10	26	20	32	29	23	20	127	60	24	18	24	21	33	29	130	55	151	75	680	280	680	360	400	208
11	25	21	34	30	–	–	120	60	22	18	25	21	36	30	160	54	200	71	615	290	830	380	340	140
12	26	22	38	32	–	–	83	52	21	18	26	20	35	30	165	54	160	74	620	290	670	378	420	137
13	25	22	35	31	–	–	106	55	21	19	25	20	36	32	165	63	180	76	580	310	630	218	400	180
14	27	22	35	31	–	–	–	–	21	18	25	21	38	32	145	66	182	85	930	300	680	320	440	200
15	27	21	34	31	56	37	50	25	22	19	25	20	40	35	153	72	177	82	620	296	900	320	550	200
16	27	23	36	32	174	41	70	57	22	20	25	20	41	37	164	68	170	83	720	356	750	360	590	220
17	29	25	35	30	79	40	–	–	24	20	25	22	48	31	132	68	220	85	795	320	880	385	560	210
18	34	24	34	29	84	42	74	50	21	19	26	21	45	38	125	65	187	95	605	275	860	380	520	210
19	29	26	35	29	83	45	69	48	21	19	26	23	45	39	135	70	219	90	530	270	760	360	495	200
20	30	26	32	30	123	54	57	43	20	18	25	24	45	39	136	72	275	90	480	250	920	360	670	200
21	33	23	35	29	170	52	–	–	20	18	37	23	44	38	128	73	371	92	520	270	890	400	670	200
22	32	27	35	30	174	59	33	29	21	17	26	22	45	38	125	68	368	95	558	270	910	360	560	220
23	32	25	33	31	192	64	–	–	21	19	27	23	51	37	135	66	388	110	595	280	920	390	800	220
24	–	–	33	30	150	60	36	20	21	19	26	21	55	38	180	66	254	125	650	280	950	350	850	250
25	–	–	33	30	190	60	26	20	21	18	28	24	54	39	200	70	310	130	724	290	1360	440	600	240
26	34	30	34	30	148	56	23	19	22	18	28	25	54	42	228	75	370	140	635	325	470	210	380	180
27	34	30	34	30	180	64	21	16	23	19	29	26	60	47	186	76	430	165	486	260	460	220	365	160
28	34	28	35	30	115	60	21	18	24	20	28	25	76	45	200	78	420	170	570	275	520	220	490	155
29	34	29	35	30	105	57	21	18	25	20	–	–	102	46	175	76	540	160	680	272	455	205	320	120
30	32	28	33	28	–	–	22	18	27	21	–	–	98	48	171	76	515	200	730	310	475	200	220	110
31	32	26	35	31	–	–	25	18	–	–	–	–	–	–	183	87	500	210	–	–	400	210	–	–

1/ Collection and analysis by Scott Paper Company

Table 16 - Chloride concentrations, Delaware River at Delaware Memorial Bridge, near Wilmington, Del.

Daily maximum and minimum chloride concentrations in milligrams per liter

December 1, 1979 to November 30, 1980

Day	December		January		February		March		April		May		June		July		August		September		October		November	
	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	40	*	237	*	228	31	1160	363	*	*	–	–	563	*	1420	304	–	–	2590	1210	3510	1470	1710	816
2	38	*	234	*	285	33	1250	403	*	*	–	–	608	30	1440	329	–	–	2730	1220	3600	1600	1810	757
3	45	*	254	*	332	33	1280	450	31	*	–	–	597	37	1360	324	–	–	3290	1170	3590	1600	1950	845
4	50	*	282	31	648	38	1890	600	*	*	–	–	698	42	1290	324	–	–	2490	1210	3590	1640	1880	881
5	55	*	285	33	656	40	2080	729	*	*	–	–	659	45	1420	369	–	–	2280	1270	3600	1480	1860	797
6	43	*	304	33	847	85	2140	591	37	*	–	–	673	55	1270	313	–	–	3220	1240	3510	1480	2160	600
7	35	*	304	*	1250	188	2010	704	177	*	–	–	724	53	1380	346	–	–	2620	1200	3600	1630	2310	974
8	33	*	145	*	1480	217	2330	853	*	*	–	–	735	85	1410	360	–	–	3440	1280	3600	1590	2180	980
9	*	*	222	*	1770	265	–	–	42	*	–	–	743	38	1580	369	–	–	3220	1300	–	–	2120	1000
10	*	*	242	31	1800	358	–	–	*	*	–	–	833	91	1590	408	–	–	3290	1310	–	–	2050	788
11	*	*	288	33	2070	380	–	–	*	*	–	–	805	97	1460	431	–	–	3290	1230	–	–	1460	698
12	*	*	168	*	1940	372	–	–	*	*	–	–	769	100	1720	436	–	–	2420	1220	–	–	1800	788
13	*	*	102	*	1960	445	–	–	30	*	47	*	904	119	1720	465	1720	645	2670	1350	–	–	2410	935
14	30	*	168	*	1920	448	–	–	97	*	100	*	878	137	1640	453	2250	664	3290	1430	–	–	2530	923
15	35	*	254	*	1820	403	–	–	*	*	74	*	968	142	1780	535	1920	670	3220	1390	–	–	2650	912
16	55	*	403	*	2290	555	–	–	*	*	91	*	960	171	1540	465	1860	656	3220	1510	3590	1700	2590	1040
17	48	*	583	*	1830	453	–	–	*	*	102	*	878	177	1370	450	2040	729	3510	1500	3590	1490	2690	1000
18	142	*	566	*	1900	456	–	–	*	*	131	*	1010	225	1240	473	2070	822	3290	1150	3590	1680	2690	1210
19	231	*	479	*	1890	501	–	–	*	*	111	*	836	208	1280	496	2250	805	3220	1140	3020	1490	2730	963
20	288	*	380	*	1910	529	–	–	*	*	59	*	915	251	1230	515	2330	752	3220	1200	3510	1460	2880	1210
21	256	*	414	*	2070	650	–	–	*	*	102	*	991	259	1240	467	2760	890	3440	1270	3360	1450	3090	1270
22	355	*	394	*	2090	673	–	–	*	*	91	*	1160	265	1170	470	2850	929	3440	1170	2910	1430	2960	1200
23	360	*	481	*	1940	735	–	–	*	*	52	*	1050	276	1050	434	3290	884	3510	1310	3510	1450	3640	1310
24	369	*	242	*	1900	648	*	*	*	*	108	*	1050	274	1440	425	3510	935	3590	1350	3510	1430	3590	1530
25	366	*	248	*	1880	636	*	*	*	*	154	*	954	268	1500	484	3090	943	3600	1520	3600	1750	3020	1000
26	294	*	208	30	1800	484	*	*	*	*	162	*	1040	291	1480	496	3360	971	3600	1310	2610	732	2230	833
27	214	*	237	*	1980	577	*	*	*	*	205	*	1150	313	1820	510	3510	1020	3290	1240	1970	659	2220	800
28	159	*	256	33	1570	453	33	*	*	*	248	*	1190	291	1900	549	3590	1120	3590	1290	2000	679	2460	957
29	111	*	288	31	1490	408	35	*	–	–	374	*	1350	332	–	–	3510	1200	3590	1260	2120	712	2150	957
30	157	*	182	30	–	–	*	*	–	–	465	*	1430	279	–	–	3150	1230	3600	1430	1990	777	1770	681
31	231	*	291	33	–	–	33	*	–	–	580	*	–	–	–	–	3440	1120	–	–	1970	825	–	–

* Less than 30 mg/L.

Table 17 - Chloride concentrations, Delaware River at Reedy Island Jetty, Del.

Daily maximum and minimum chloride concentrations in milligrams per liter

December 1, 1979 to November 30, 1980

Day	December		January		February		March		April		May		June		July		August		September		October		November	
	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	–	–	2710	591	3620	952	5600	3360	–	–	1270	205	4150	1450	5250	2380	5280	2570	5950	3510	8130	4520	4330	2670
2	–	–	2640	659	–	–	5120	3830	–	–	1820	148	4200	1510	5340	2390	4700	2500	5500	2910	7700	5120	5220	2520
3	–	–	2500	614	–	–	–	–	–	–	1930	159	3980	1590	4700	2310	4350	2450	5600	2940	7600	5090	5280	2240
4	–	–	2170	670	–	–	6780	3510	–	–	1650	159	4090	1400	4700	2290	5900	2430	5960	2950	8040	5160	4380	2990
5	3510	445	2950	839	–	–	7530	3880	–	–	1470	159	4090	1470	5030	2390	5600	2770	5950	3220	7130	4700	4200	2940
6	2530	389	3220	997	–	–	6890	2950	–	–	1870	171	4520	1680	4480	2380	5340	2660	5960	3360	7860	4700	5910	3080
7	2660	490	3090	952	–	–	7130	2810	–	–	1820	217	4330	1730	5120	2310	5600	2520	5830	3220	7920	5030	5340	3130
8	2010	102	1680	704	–	–	6950	3050	–	–	1690	262	5030	1750	4330	2520	5500	2520	5960	3600	8000	5120	5160	2810
9	2350	159	1800	715	–	–	6280	3220	–	–	1940	285	4440	1510	5280	2220	5600	2380	5980	3640	7400	4800	5960	3090
10	2170	159	1960	715	–	–	6820	3510	171	38	2570	321	4350	1650	5280	2240	5830	2430	5950	3080	7700	5030	5600	3150
11	3090	217	2310	771	–	–	7530	3200	171	31	2220	389	4200	1680	5370	2430	5910	2570	5600	3090	7470	5030	3850	2250
12	3220	159	1870	434	–	–	5160	2430	52	31	2250	366	4200	1650	5550	2590	5600	2630	5830	3190	7130	4800	5550	2360
13	1610	159	1310	332	–	–	6000	2450	52	31	1830	332	4380	1680	5250	2630	5400	2590	5830	3360	6950	4520	9240	4440
14	2390	262	2520	557	–	–	6780	3080	159	31	2150	321	4520	1750	5400	2630	5600	2780	5910	3640	7470	4650	8310	4440
15	2670	512	2770	783	–	–	3980	2530	251	*	1730	285	4650	1870	5500	2800	5400	2660	5250	3690	7970	4200	8730	4380
16	3060	670	3360	839	–	–	3880	2240	52	31	1830	321	4440	1870	5000	2450	5280	2530	7700	3930	7800	4600	8400	5160
17	2030	479	2310	963	–	–	3980	2110	137	*	2100	332	4200	1820	–	–	5500	2570	7000	5030	7920	4700	7920	5120
18	2810	501	1650	1190	–	–	–	–	52	*	1800	400	5000	2030	–	–	6280	3060	6820	4060	7470	5160	8730	5830
19	3360	625	1410	1120	–	–	2940	1680	38	*	1410	389	4380	2100	–	–	5980	2990	6820	3950	7570	4200	9080	5220
20	3690	1050	1410	1120	–	–	3980	1400	91	*	1610	377	4700	2240	–	–	6330	2940	7000	3930	7600	4330	9560	5370
21	3600	997	2990	1010	–	–	3700	1680	31	*	1510	445	4380	1870	4520	2070	6780	3600	6850	3980	7430	4440	9680	5600
22	2990	1050	2910	1010	–	–	–	–	–	–	–	–	4520	1870	4800	2110	6950	3850	6920	3700	6820	4350	8730	5340
23	2990	1120	3360	1010	–	–	–	–	–	–	–	–	5280	1960	5220	2030	6920	3830	6890	3830	6890	4330	9780	5830
24	2920	1120	2030	929	–	–	–	–	–	–	–	–	5030	2010	5500	2100	6600	3830	7470	3930	7600	4440	9680	5910
25	2670	1310	2240	771	–	–	–	–	1540	171	–	–	4700	1820	5960	2220	6800	3700	7800	4350	9650	5400	8220	5500
26	2210	1120	1960	738	5620	3830	–	–	1890	205	–	–	5120	1820	5830	2380	6820	3700	6950	4090	5980	3830	7530	5030
27	2350	783	2670	614	7470	3690	–	–	1730	321	3880	1010	5280	2010	5600	2450	6820	3700	6330	3950	5030	3360	7130	5090
28	1790	704	3440	738	6330	3700	–	–	2110	332	3930	1010	5030	2100	5280	2450	6780	3700	6890	3980	5400	3510	8570	5120
29	1520	501	3600	771	5930	3510	–	–	2110	332	4170	1260	5910	2250	5600	2520	6450	3880	7470	3980	5980	3510	7130	5160
30	2100	512	2700	659	–	–	–	–	1660	332	4330	1370	5220	2360	5400	2490	6330	3880	7130	4520	6250	3220	6450	4440
31	2670	557	3640	704	–	–	–	–	–	–	4150	1510	–	–	5160	2500	5960	3930	–	–	4650	1790	–	–

* Less than 30 mg/L.

Table 18 - Dissolved oxygen, Delaware River at Benjamin Franklin Bridge at Philadelphia, Pa.

Daily mean dissolved oxygen in milligrams per liter

December 1, 1979 to November 30, 1980

Day	December Mean	January Mean	February Mean	March Mean	April Mean	May Mean	June Mean	July Mean	August Mean	September Mean	October Mean	November Mean
1	8.4	10.1	8.4	7.8	10.8	7.2	3.2	0.6	0.3	1.1	0.9	3.1
2	8.7	10.0	8.5	7.8	10.7	7.7	3.4	0.7	0.5	1.4	0.7	3.3
3	9.1	9.9	8.7	7.9	10.8	7.7	2.9	0.5	0.8	1.2	0.5	3.4
4	9.1	9.9	8.7	7.6	10.5	8.0	2.3	0.5	1.0	1.0	0.5	3.2
5	9.5	9.8	8.8	7.5	10.6	7.9	2.2	0.8	1.1	0.8	0.6	2.9
6	9.5	9.7	8.8	7.5	10.5	7.3	1.8	0.9	0.9	0.7	0.7	2.7
7	9.4	9.8	8.7	7.3	10.2	6.8	1.3	1.1	1.0	0.9	0.6	2.6
8	9.9	10.3	8.5	7.0	9.9	6.1	1.2	1.1	1.0	1.0	0.7	2.7
9	10.3	10.0	8.3	6.9	9.4	5.6	2.0	0.9	1.0	1.0	0.7	2.6
10	10.3	9.8	8.2	6.8	8.5	5.5	1.8	0.6	1.3	1.0	0.7	2.8
11	10.1	9.5	8.1	7.0	8.3	5.5	1.5	0.5	1.1	1.1	0.6	4.5
12	9.6	9.9	8.3	-	8.5	5.1	1.3	0.5	0.8	1.2	0.8	5.2
13	9.4	10.8	8.3	-	8.3	4.4	1.4	0.7	0.7	1.0	1.3	5.1
14	8.8	10.6	8.2	-	9.0	4.6	1.3	0.8	0.7	1.0	1.6	4.8
15	8.7	10.3	8.1	-	8.4	4.9	1.6	1.0	-	0.9	1.2	4.4
16	8.8	9.9	7.7	-	8.7	4.8	1.6	1.0	-	0.9	0.9	4.2
17	9.5	9.6	7.8	-	8.8	4.5	1.5	0.5	-	0.8	0.8	4.3
18	9.5	9.2	8.0	-	8.6	4.4	1.4	0.4	-	0.7	0.8	4.4
19	9.3	9.0	8.2	-	8.9	4.0	-	0.4	0.5	0.6	0.7	4.6
20	9.2	9.1	8.1	-	9.2	3.4	-	0.6	0.5	0.7	0.8	4.5
21	9.1	9.0	7.6	-	9.3	2.8	-	0.6	0.5	0.7	1.0	4.3
22	8.9	9.0	7.3	10.5	8.9	2.5	-	0.6	0.4	0.7	1.0	4.2
23	8.9	8.7	7.0	11.1	8.5	2.6	-	0.4	0.5	0.7	1.0	4.2
24	9.1	8.8	7.0	11.8	8.2	2.3	-	0.4	0.7	0.8	1.2	4.2
25	9.2	8.7	7.2	12.0	7.7	2.3	1.2	0.4	0.8	0.7	1.8	4.0
26	9.7	8.4	7.2	11.9	7.3	3.1	0.8	0.6	0.8	0.7	3.9	5.1
27	10.6	8.2	7.1	11.6	7.0	3.8	0.6	0.9	0.6	0.9	5.4	5.7
28	11.1	8.2	7.4	11.4	6.8	3.9	0.7	1.3	0.5	1.1	4.9	5.8
29	10.9	8.3	7.5	11.2	6.3	4.1	0.7	0.8	0.5	1.5	4.4	6.4
30	10.6	8.5	-	11.2	6.7	4.0	0.6	0.5	0.5	1.2	3.8	7.7
31	10.3	8.3	-	11.1	-	3.3	-	0.5	0.7	-	3.3	-

Table 19 - Dissolved oxygen, Delaware River at Delaware Memorial Bridge near Wilmington, Del.

Daily mean dissolved oxygen in milligrams per liter

December 1, 1979 to November 30. 1980

Day	December Mean	January Mean	February Mean	March Mean	April Mean	May Mean	June Mean	July Mean	August Mean	September Mean	October Mean	November Mean
1	7.3	9.7	11.3	11.8	9.4	-	5.1	4.4	-	4.8	6.1	7.5
2	7.4	9.5	11.9	12.2	9.3	-	4.9	4.4	-	4.8	6.1	7.6
3	8.0	9.5	12.3	12.6	9.1	-	4.9	4.0	-	4.7	6.0	7.8
4	8.4	9.5	12.6	12.9	8.9	-	4.9	3.7	-	4.8	6.0	7.9
5	8.5	10.2	12.7	12.8	8.9	-	5.0	3 7	-	4.8	6.0	7.8
6	8.8	10.4	12.7	12.6	8.8	-	4.9	3.8	-	4.8	6.1	7.9
7	8.8	10.7	13.0	12.6	8.7	-	4.8	4.1	-	4.8	6.3	8.0
8	8.9	10.5	13.1	-	8.6	-	4.8	4.3	-	5.0	6.2	8.0
9	9.3	10.5	13.1	-	8.6	-	5.2	4.2	-	5.1	-	8.0
10	9.6	10.5	13:0	-	8.3	-	5.5	4.0	-	5.3	-	7.9
11	9.7	10.6	13.0	-	8.0	-	5.4	3.8	-	5.4	-	8.0
12	9.6	10.6	12.8	-	7.6	-	5.3	3.8	-	5.5	-	8.7
13	9.6	10.6	12.7	-	7.3	7.1	5 1	3.9	4.7	5.6	-	9.1
14	9.7	10.9	12.6	-	7.4	6.9	5.1	4.0	4.7	5.6	-	9.0
15	9.8	11.1	12.4	-	7.4	6.9	4.8	4.3	4.6	5.5	-	8.9
16	9.7	11.4	12.5	-	7.3	7.0	4.7	4.4	4.7	5.7	7.1	9.0
17	9.5	11.3	12.4	-	7.4	7.1	4.6	4.3	5.1	5.8	6.9	9.0
18	10.0	11.0	12.5	-	7.2	7.3	4.7	4.2	5.1	5.7	7.1	9.1
19	10.3	10.6	12.4	-	7.0	7.1	4.8	4.0	5.0	5.5	7.0	9.2
20	10.9	10.5	12.4	-	6.8	7.0	5.1	4.0	4.9	5.5	6.9	9.3
21	11.2	10.5	12.3	-	6.9	7.1	5.4	4.0	5.1	5.5	7.1	9.2
22	11.0	10.5	12.3	-	6.9	7.1	5.4	4.0	5.2	5.3	7.1	9.1
23	10.8	10.6	12.2	-	7.1	7.1	5.2	4.1	5.0	5.2	7.1	9.2
24	10.5	10.6	11.9	8.8	7.1	7.0	5.1	4.2	4.8	5.4	7.2	9.2
25	10.6	10.7	11.8	8.9	7.1	6.7	5.0	4.4	4.7	5.5	7.6	8.9
26	10.1	10.6	11.7	9.3	7.1	6.5	4.8	4.4	4.8	5.3	7.4	8.8
27	9.8	10.7	12.0	9.5	7.0	6.3	4.6	4.5	4.7	5.5	7.4	8.8
28	9.7	10.7	11.8	9.4	7.3	6.1	4.6	-	4.7	5.7	7.5	9.1
29	9.7	10.6	11.7	9.4	-	5.8	4.6	-	4.7	5.8	7.4	9.1
30	9.8	10.6	-	9.3	-	5.7	4.4	-	4.7	6.0	7.5	8.9
31	9.8	11.2	-	9.5	-	5.4	-	-	4.8	-	7.5	-

FIGURE 6

Mean monthly temperatures of Delaware River at Benjamin Franklin Bridge, Philadelphia, Pa.

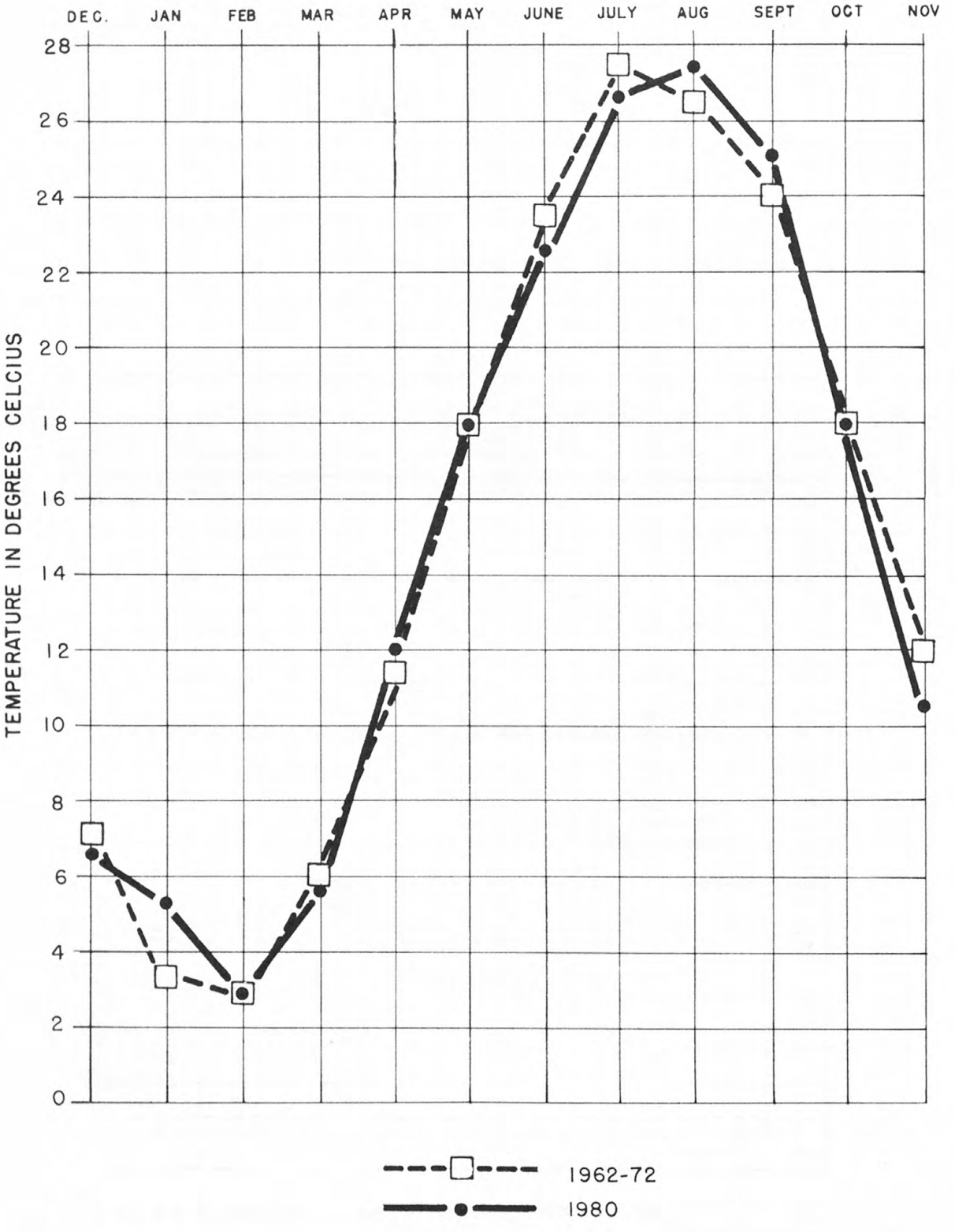
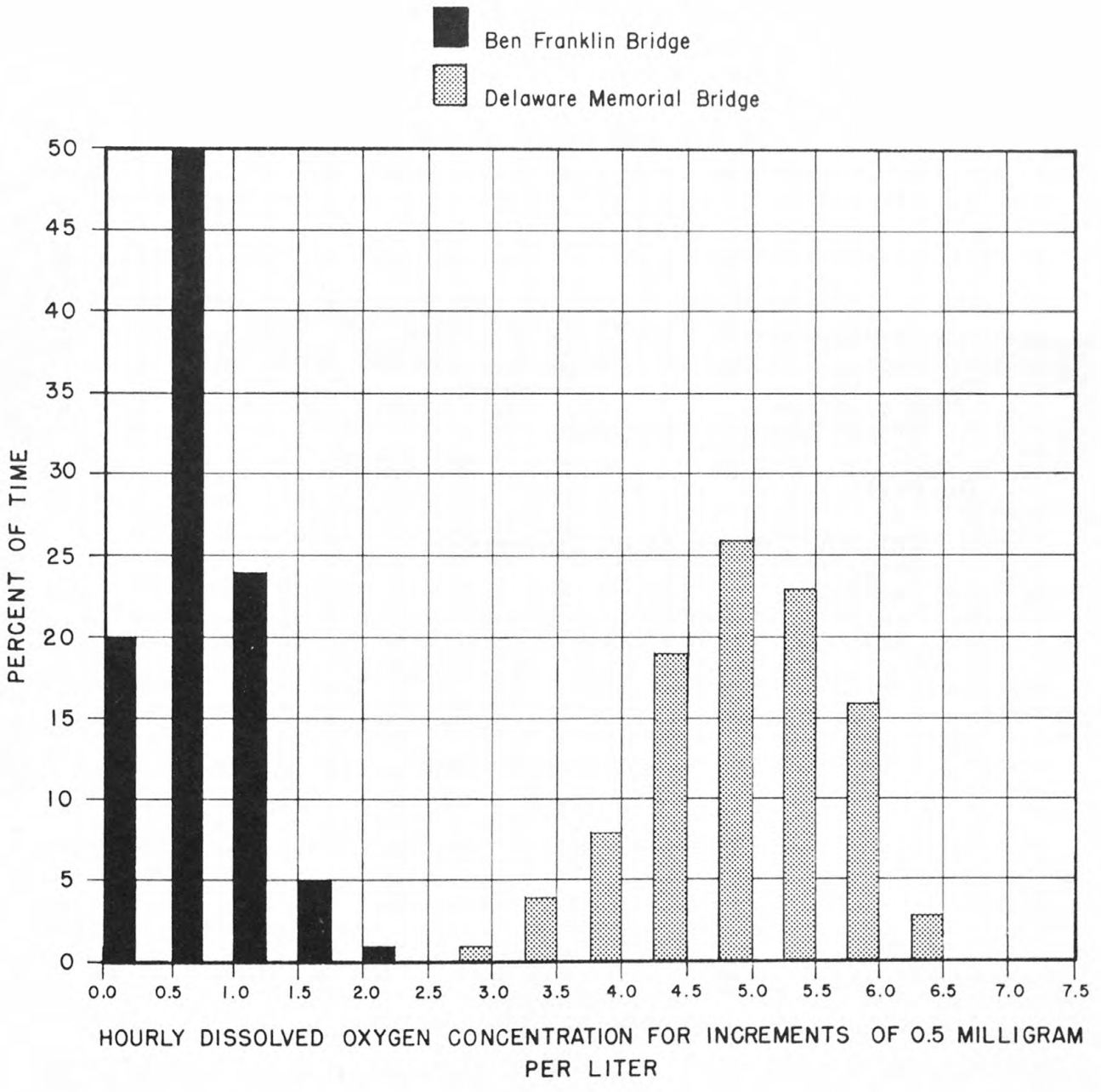


FIGURE 7

Frequency of dissolved oxygen concentrations at two stations in the Delaware River during July, August, and September 1980.



Appendix

A. MEMORANDUM OF AGREEMENT

B. RIVER MASTER LETTERS

C. DELAWARE RIVER BASIN COMMISSION RESOLUTIONS

United States Department of the Interior

GEOLOGICAL SURVEY

OFFICE OF THE DELAWARE RIVER MASTER

Mail Stop 433, Reston, Va. 22092

MEMORANDUM OF AGREEMENT

WHEREAS the City of New York operates the Pepacton, Cannonsville, and Neversink Reservoirs in the upper Delaware River basin (hereinafter "the Reservoirs"); and

WHEREAS diversions of water from the Reservoirs by the City of New York are authorized and compensating releases of water from the Reservoirs downstream are stipulated under the terms of the Decree of the United States Supreme Court in New Jersey v. New York, 347 U.S. 995 (1954) (hereinafter "the 1954 Decree"); and

WHEREAS the 1954 Decree requires releases of water from the Reservoirs at the direction and under the supervision of the Delaware River Master, appointed under the 1954 Decree, which releases are designed to maintain a minimum basic rate of flow at the gaging station of the United States Geological Survey on the Delaware River at Montague, New Jersey, of 1,750 cubic feet per second; and

WHEREAS the 1954 Decree also provides under Paragraph III B 1 (c), for the computation of an annual excess release quantity, and under Paragraph III B 1 (d), for the release of the annual excess quantity; and

WHEREAS the State of New York desires to effect certain flows downstream of the Reservoirs and in the main stem of the Delaware River for the purpose of enhancing the river quality, fishery, esthetics, and recreation; and to afford an opportunity for the evaluation of the effects of the modified flows; and

WHEREAS the parties to the Decree have no objection to a temporary redistribution of the annual excess quantity from June 1, 1979 through May 31, 1980 for the above purpose, to the extent the annual excess quantity will permit:

THEREFORE, the undersigned parties to the 1954 Decree unanimously agree to a temporary redistribution of the annual excess quantity, and the parties unanimously request the approval of the River Master to the temporary redistribution of the annual excess release quantity, from June 1, 1979 through May 31, 1980, under the following schedule to the extent the annual excess quantity will permit:

(a) The following minimum releases shall be made at all times from the Reservoirs:

Reservoir	Release in Cubic Feet Per Second	
	April 1 to October 31	November 1 to March 31
Pepacton	70	50
Cannonsville	45 (except 325 June 15 to August 15)	33
Neversink	45	25

(b) An amount as determined by the State of New York, the total of which shall not exceed 6,000 second-foot-days per year, for the relief of thermal stress in the rivers downstream of the reservoirs and the main stem of the Delaware River, designed to prevent to the extent practicable any water temperature higher than 75 F or daily average water temperature higher than 72 F as measured at Callicoon, Harvard, Woodbourne, and Hale Eddy gaging sites; provided, that no thermal stress release shall be made November 1 to May 31.

IN WITNESS HEREOF, the undersigned parties, by their duly authorized officials and counsel, have caused this agreement to be duly executed, each intending to become legally bound hereby.

For the State of Delaware

June D. MacArtor

Richard S. Gebelein
Attorney General by
June D. MacArtor
Deputy Attorney General

Robert R. Jordan
State Geologist
Delaware Geological Survey

Austin P. Olney
Secretary
Department of Natural Resources
and Environmental Control

For the State of New Jersey

Deborah T. Poritz
John J. Degnan
Attorney General by
Deborah T. Poritz
Deputy Attorney General

Daniel O'Hern
Commissioner
New Jersey Department of
Environmental Protection

For the State of New York

ROBERT ABRAMS
Attorney General by
CARL H MOORE JR
ASSISTANT ATTORNEY GENERAL

Eldred Rich
Deputy Commissioner
New York State Department of
Environmental Conservation

For the Commonwealth of Pennsylvania

Edward G. Biester, Jr.
Attorney General by
Douglas R. Blazey
Special Assistant Attorney General

Maurice K. Goddard
Department of Environmental
Resources

For the City of New York

Corporation Counsel

Francis X. McArdle
Commissioner
New York City Department
of Environmental Protection

Approval of the Temporary Redistribution of Annual
Excess Release Quantities, as requested,
is hereby given:

Date September 24, 1979

Approved Francis T. Schaefer
Francis T. Schaefer
Delaware River Master

United States Department of the Interior

GEOLOGICAL SURVEY

OFFICE OF THE DELAWARE RIVER MASTER

Mail Stop 433, Reston, Va. 22092

October 15, 1980

Members of Delaware River Master Advisory Committee:

Dr. Robert R. Jordan, Director and State Geologist.
Delaware Geological Survey

Mr. Dirk Hofman, Deputy Director, Division of Water Resources
New Jersey Department of Environmental Protection

Mr. Eldred Rich, Assistant Commissioner
New York Department of Environmental Conservation

Mr. Francis X. McArdle, Commissioner
New York City Department of Environmental Protection

Mr. R. Timothy Weston, Associate Deputy Secretary
Pennsylvania Department of Environmental Resources

Dear Sirs:

At the October 8, 1980, meeting of the Delaware River Basin Commission Mr. Fish announced that storage in the New York City reservoirs was extremely low for this time of the year and depleting rapidly. Projections then indicated that storage would reach the generally accepted drought-warning level in a matter of 2 or 3 weeks. The attitude of the Commission with regard to invoking conservation measures was sought. For some reason the subject was not given further consideration.

As of yesterday, storage remaining in the reservoirs was 114 billion gallons or about 42 percent of the usable capacity. The drought-warning level is considered to be at about 40 percent of capacity. It now appears that storage will be depleted to that level in a few days. With inflow to the reservoirs estimated at about 230 cfs and with a National Weather Service outlook of only 2 to 4 inches of precipitation to mid-November it appears that conservation measures should be initiated promptly.

I am proposing to proceed along the lines that the Good Faith negotiating group developed for this situation. This will involve reducing the Montague design flow to 1650 cfs, reducing the New York City diversions, and possible other measures.

Your comments to this proposal are requested without delay. Please call me at (703) 860-6985 or Mr. Robert E. Fish at (717) 296-7213 with your comments. A followup letter will be appreciated and it may well be that we should meet at an early date to further consider the situation.

Sincerely yours,

Francis T. Schaefer
Delaware River Master

Copy to: Michael Rodak, Jr., Esq.
Philip Cohen
Thomas P. Eichler
Robert E. Fish
Gerald M. Hansler
Thomas D. O'Connell
Austin P. Olney
Governor Sherman Tribbitt

United States Department of the Interior

GEOLOGICAL SURVEY

OFFICE OF THE DELAWARE RIVER MASTER

Mail Stop 433, Reston, Va. 22092

November 12, 1980

Members of the Delaware River Master Advisory Committee:

Dr. Robert R. Jordan, Director and State Geologist
Delaware Geological Survey

Mr. Dirk Hofman, Deputy Director, Division of Water Resources
New Jersey Department of Environmental Protection

Mr. Edward A. Karath, Chief, Bureau of Water Resources
New York Department of Environmental Conservation

Mr. Francis X. McArdle, Commissioner
New York City Department of Environmental Protection

Mr. R. Timothy Weston, Associate Deputy Secretary
Pennsylvania Department of Environmental Resources

Dear Sirs:

Storage in New York City's Delaware reservoirs continues to decline, as you know. The reductions in diversions and releases agreed to on October 17, 1980, and ordered into effect immediately, have been helpful in slowing the rate of reservoir depletion but it now appears that additional water conservation measures are warranted.

As of this morning, storage in the three reservoirs totaled 31.4 percent of capacity, compared to 32.0 percent on November 10, and 36 percent on October 31. Diversions to the city have averaged 661 mgd for the last 25 days, somewhat less than the figure agreed to on October 17.

If the present rate of depletion continues, the reservoirs will be at the drought level near the end of the month. The situation accordingly is very serious and I hereby propose a prompt discussion or exchange of views on additional conservation measures acceptable to you. As long as the outlook for significant runoff continues on the bleak side it is only prudent that we conserve the water in the reservoirs as judiciously as possible. To eliminate the need for another meeting, I propose the following changes be made:

New York City diversions - 600 mgd
Montague design flow - 1500 cfs
New Jersey diversions - 65 mgd

If you can all agree to these figures they will be put into effect. To ascertain your views a conference telephone call has been scheduled for 10:45 a.m. on Friday, November 21, 1980. I regret the delay but this is the earliest date our operator could schedule except for evening hours. It will be appreciated if you or your delegate can be available at the specified time. I also expect this matter will be discussed if the principals do meet in Trenton on November 19.

Sincerely yours,

Francis T. Schaefer
Delaware River Master

Copy to: Philip Cohen
Robert E. Fish
✓Gerald M. Hansler
Sherman W. Tribbitt

RESOLUTION NO. 80-20

A RESOLUTION to provide for the temporary modification of the diversion and release rights and obligations of the parties to the U.S. Supreme Court decree of 1954.

WHEREAS, current reservoir and ground water levels and streamflow conditions throughout the Delaware Basin indicate the early stages of a drought, calling for conservation measures to minimize future adverse impacts on water users; and

WHEREAS, a temporary reduction in authorized diversions and compensating releases if made now may forestall the necessity for more severe emergency measures at a later date; and

WHEREAS, it is the responsibility of the Commission to allocate waters of the Basin in such manner and at such times as will equitably distribute the risks of water shortages, and protect the health, safety and welfare of the people dependent upon the waters of the Basin; Now Therefore,

BE IT RESOLVED by the Delaware River Basin Commission:

1. Findings. The Commission hereby finds and determines:

   (a) The Delaware Basin has experienced a cumulative precipitation deficit since May 1980, of approximately 6 inches.

   (b) Augmented releases from the U.S. Army Corps of Engineers' Beltzville and Blue Marsh reservoirs have been necessary since August to maintain desired Delaware River flows. Measured at Trenton, New Jersey, these flows have averaged 3800 cubic feet per second during May to September compared to the long-term average of 5100 cubic feet per second for the same period. Further, storage levels in Beltzville and Blue Marsh reservoirs are being rapidly depleted.

(c) Chloride concentrations in the Delaware River estuary are presently at the control point (Mouth of Schuylkill River) established by the Commission.

(d) Combined storage levels in the New York City-Delaware Basin reservoirs are presently 40 percent of capacity and are in "drought warning condition" as defined in reservoir release regulations of the New York State Department of Environmental Conservation (Part 671), and models used in the Delaware River Basin Commission's 77-20 study, and will decline to 25 percent of capacity by mid-November, if current diversion and release rates are continued and in the absence of increased precipitation.

2. Modification of Requirements of Supreme Court decree of 1954. Pursuant to the authority provided in Section 3.3(a) of the Delaware River Basin Compact the diversions and releases provided for in the U.S. Supreme Court decree of 1954, New Jersey v. New York, 347 U.S. 995, are temporarily modified as follows:

(a) Diversions by the City of New York from its Delaware Basin reservoirs shall not exceed an average of 680 million gallons per day.

(b) Combined diversions by the State of New Jersey through the Delaware and Raritan Canal, or from other Delaware River Basin sources, shall not exceed an average of 65 million gallons per day.

(c) The City of New York shall release to the Delaware River such amounts as are required in the judgment of the River Master to sustain a flow at Montague of not less than 1655 cubic feet per second.

3. Modification of the Trenton Flow Objective. The Commission shall operate the reservoirs in the middle and lower basin to achieve a flow objective at Trenton of 2700 cubic feet per second.

4. Duration and Termination. This resolution shall terminate on December 31, 1980, unless prior thereto (i) it is extended or amended by the Commission upon unanimous consent of the parties to the Supreme Court decree or (ii) the combined storage in the New York City-Delaware Basin reservoirs reaches a level 10 billion gallons above the drought warning curve shown on Appendix A hereof and remains at or above such level for five consecutive days. If storage in the New York City reservoirs reaches the level specified herein the River Master shall notify all parties and the Commission and immediately place in effect all diversions and releases provided for in the Supreme Court decree.

5. Plan For Resumption of Normal Operating Procedures. The Commission requests the parties to the decree and the River Master, in consultation with the Commission, to develop a recovery plan for the resumption of the normal operating procedures in the basin. This plan should take into account the fact that the City of New York and the State of New Jersey have refrained, from June 1 to the date of this resolution, from taking their full allotments under the terms of the decree, and shall also take into account hydrologic conditions in the basin and the mutual sacrifices of the members of the Commission and the parties to the decree.

6. Effective Date. The terms and conditions of this resolution shall go into effect immediately upon receipt by the Commission of the consent of the authorized representatives of the parties to the U.S. Supreme Court decree. The Executive Director is hereby directed to implement the provisions of this resolution and shall notify the River Master of the Commission action taken hereunder.

s/Steven J. Picco
Steven J. Picco, Chairman pro tem

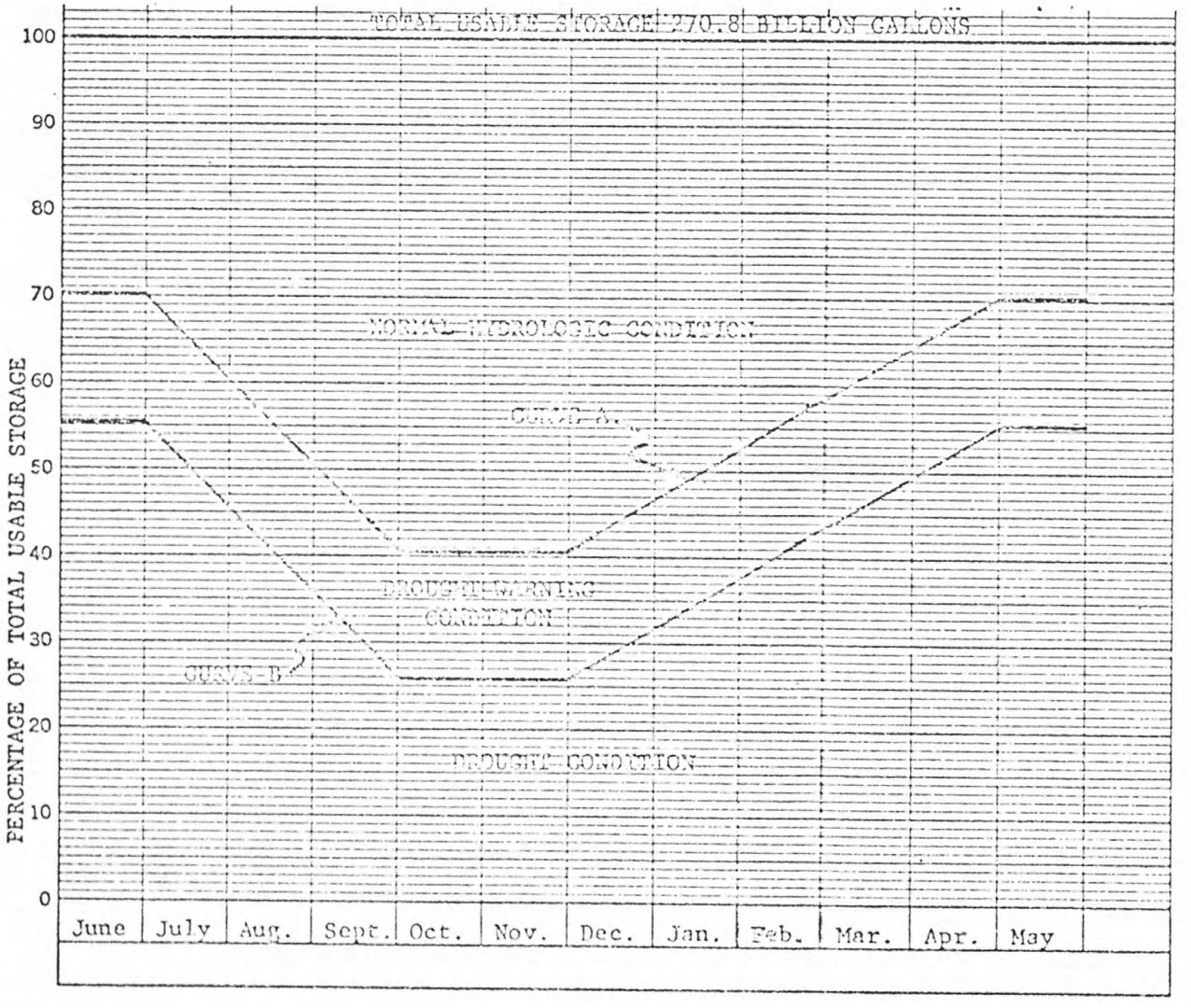
s/W. Brinton Whitall
W. Brinton Whitall, Secretary

ADOPTED: October 17, 1980

Resolution No. 80-20

Appendix A

Operation Curves for Cannonsville, Pepacton and Neversink Reservoirs



Consent To Action By The Delaware River Basin Commisison

Under Section 3.3(a) of the Compact

Consent of the parties to the U.S. Supreme Court decree in New Jersey v. New York, 1954, to the action of the Delaware River Basin Commission in adopting Resolution No. 80-20 temporarily modifying the terms of said decree is hereby given.

State of New Jersey
Date: 10/17/80

State of New York
Date: Oct. 17, 1980

State of Delaware
Date: 10/17/80

Commonwealth of Pennsylvania
Date: Oct. 17, 1980

City of New York
Date: Oct. 17, 1980

RESOLUTION NO. 80-24

A RESOLUTION to provide for a further temporary modification of the diversion and release rights and obligations of the parties to the U. S. Supreme Court decree of 1954.

WHEREAS, the Delaware River Basin Commission on October 17, 1980 adopted Resolution No. 80-20 providing for the temporary modification of the diversion and release rights and obligations of the parties to the U.S. Supreme Court decree of 1954; and

WHEREAS, the conditions which required the action in Resolution No. 80-20 have persisted and current seasonal conditions require further action to protect and conserve the water of the Delaware River Basin; and

WHEREAS, the Commission and the parties to the 1954 decree understand and recognize that immediate action is required by these present conditions although the good faith discussions relating to the interstate management of the water of the Delaware River Basin have not been concluded; and

WHEREAS, the actions of the Delaware River Basin Commission provided for herein are in response to present circumstances and not dependent upon any eventual agreement arising out of the good faith negotiations; now therefore,

BE IT RESOLVED by the Delaware River Basin Commission:

1. Pursuant to the authority provided in Section 3.3(a) of the Delaware River Basin Compact, the diversions and releases provided for in the U. S. Supreme Court decree, New Jersey v. New York, 347 U.S. 995 (1954) are further modified temporarily as follows:

(a) Diversions by the City of New York from its Delaware Basin reservoirs shall not exceed an average of 580 million gallons per day and shall be reduced to an average of 560 million gallons per day not later than December 20, 1980.

(b) The City of New York shall release to the Delaware River such amounts as are required in the judgment of the River Master to sustain a flow at Montague of not less than 1560 cubic feet per second. The flow at Montague shall be sustained at a level of 1550 cubic feet per second as of December 20, 1980.

2. The provisions of Resolution 80-20 shall remain in full force and effect except to the extent modified by this resolution. The terms and conditions of this resolution shall go into effect immediately.

3. The duration and termination of this resolution shall be as provided in paragraph 4. of Resolution No. 80-20.

s/Steven J. Picco
Steven J. Picco, Chairman Pro Tem

s/W. Brinton Whitall
W. Brinton Whitall, Secretary

ADOPTED: November 19, 1980

Consent To Action By The Delaware River Basin Commission

Under Section 3.3(a) of the Compact

Consent of the parties to the U.S. Supreme Court decree in New Jersey v. New York, 1954, to the action of the Delaware River Basin Commission in adopting Resolution No. 80-24 temporarily modifying the terms of said decree is hereby given.

State of New Jersey
Date: November 19, 1980

State of New York
Date: November 19, 1980

State of Delaware
Date: November 19 1980

Commonwealth of Pennsylvania
Date: 11/19/80

City of New York
Date:

APPROVED AS TO FORM

ACTING CORPORATION COUNSEL