



Delaware River Basin Commission
Annual Report 1979



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COVER — Springtime view of Jacobs Creek, looking upstream from Bear Tavern Road in Hopewell Township, Mercer County, N.J. Color photography by Leigh Photographs.

On these two pages appear pictures that typify the Delaware Basin's scenic variety.

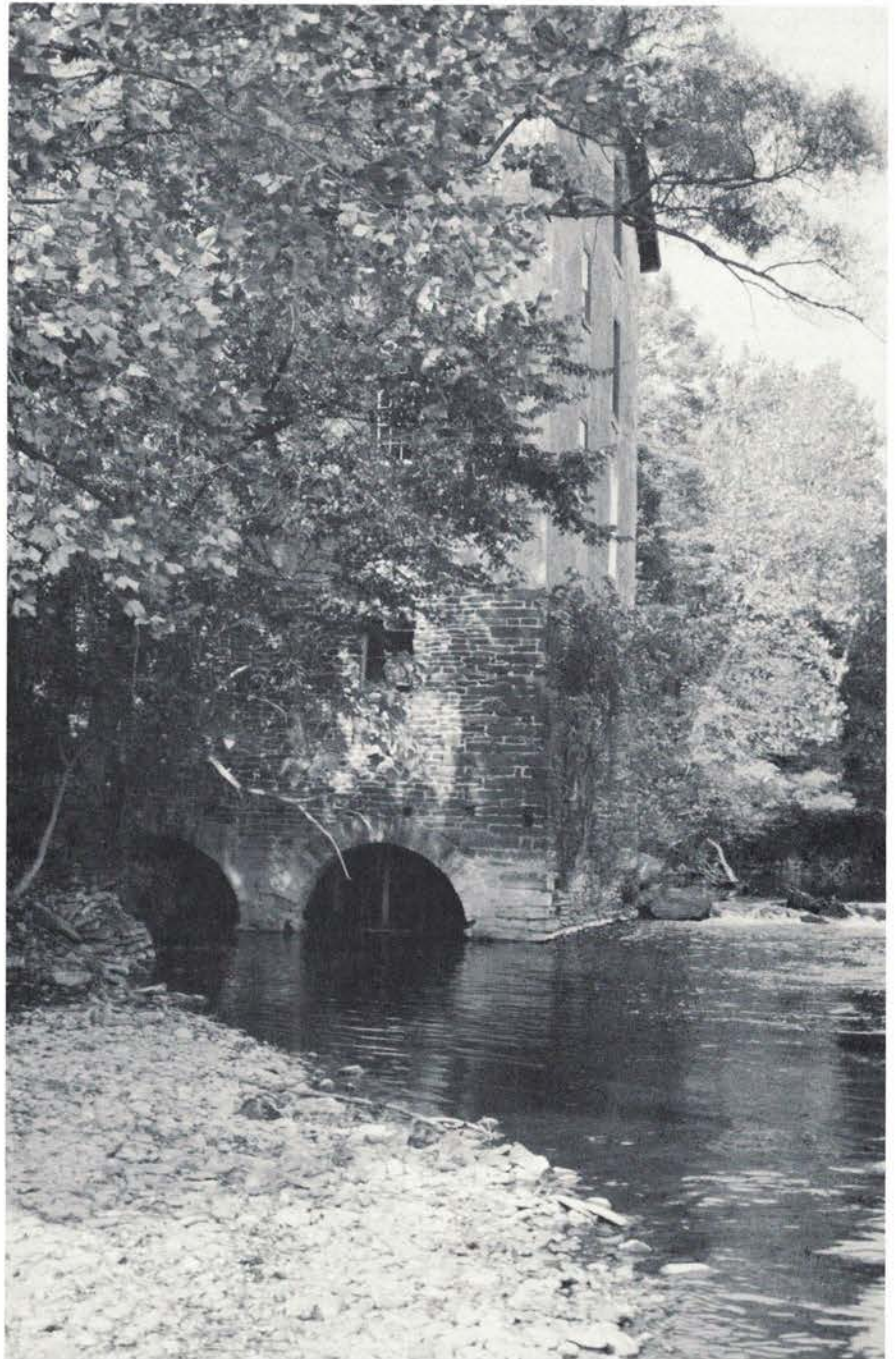
Report designed by Odette P. Taft, DRBC graphic artist/illustrator

Introduction

This is a report on the activities during 1979 of the Delaware River Basin Commission and on the state of the water resources of the valley. The agency is charged with protecting and managing those resources by its enabling law, the Delaware River Basin Compact, which was enacted in 1961 by DRBC's five equal-party signatories, Pennsylvania, New York, Delaware and New Jersey and the United States.

The annual report is the Commission's formal communication to the seven million citizens of the basin and their national and state representatives, to whom it is submitted respectfully.

Many of the activities and issues described are leading directly to adoption of important new policies, probably during the coming year, that will set the region's water management direction for years to come. Some of the same issues also confront the Commission with yet another opportunity — and challenge — to help effect the interstate comity in Delaware water matters that is the Compact's paramount objective.



Review

“Good Faith” and “Level B” forums lead to major decisions

The two dominant pursuits relating to the Delaware River Basin moved toward conclusion and thus brought the region close to making its most important water management decisions in many years.

Following are some of the big policy issues that DRBC hopes to see resolved in the coming year as the two efforts culminate:

- Volume of fresh water flows into the estuary essential to protect water supplies and public health from ocean salinity and sodium.
- Changing the dissolved oxygen standards for pollution control in estuary.
- Reducing industrial and municipal consumptive use through water conservation.
- Reservoir additions, deletions and retentions for comprehensive plan.
- Permanent conservation releases from reservoirs to enhance upper basin streams.
- Interstate allocations of water supply in future droughts.
- Procedures for declaring future droughts and operating reservoirs.

One of the two important activities leading to these decisions is the Delaware River Basin Comprehensive (Level B) Study. DRBC's special study staff produced its draft final report

that offered to the Basin Commission members a broad set of tentative recommendations for consideration in reformulating DRBC's comprehensive plan.

The second and companion effort that could affect the basin's future is the “good faith” negotiations between the five parties to the quarter-century old U. S. Supreme Court decree that allocates interstate rights to Delaware River water but which is concededly obsolete for meeting the region's needs during droughts. As authorized by the decree, New York City diverts 800 million gallons daily out of the upper Delaware Basin, in exchange for which it must guarantee a minimum flow down the Delaware to benefit the lower basin states of Pennsylvania, New Jersey and Delaware. The decree parties, who are New York City, the downstream states and also New York State, may change the court's mandate if they all agree.

Issues common to both efforts

Many of the basin's big water issues are common to both forums, and technical information used in them is and will continue to be the same. Thus the Level B study and “good faith” talks are being phased to reach their conclusions concurrently. Agreement on many of the “good faith” issues is seen as essential to realistic revision of the Commission's comprehensive plan. (This annual report also contains separate sections on the Level B study and the “good faith” talks.)

Not for many years have issues of such magnitude and number faced

the policy makers of the Delaware Basin. Actually, the last water management decision of great moment by the Commission was a negative one — one that reshaped and deferred the issues it faces now. That was the 1975 split-vote recommendation to the Congress against funding the construction start of the huge and unpopular Tocks Island reservoir, which remains unbuilt.

In essence, that decision abandoned the idea of extensive main stem flood control and large-scale water supply availability for which Tocks was proposed. It meant turning instead to scaled-down benefits. The matters being tackled now deal with viable alternatives.

Shortly after DRBC was created in 1961, it adopted a grandiose comprehensive plan that included 11 major reservoirs — two of them enlargements of existing impoundments — in addition to the massive Tocks Island facility. Although two have been completed and three — including the two existing facilities slated for expansion — are still under consideration, the others are mostly regarded as unlikely candidates. The DRBC comprehensive plan still contains them all, however.

The plan is not confined to structural features. It also contains management policies, guidelines and standards relating to water supply, fisheries, recreation, wetlands, water quality and more. Principal among these are the basinwide and estuary water quality standards that were adopted in the late 1960s.

Dr. Goddard retires

Maurice K. Goddard retired after 25 years as both Pennsylvania's top representative on Delaware River water matters and the Commonwealth's distinguished chief environmental officer, most recently as environmental resources secretary. In 1955, he became then-Governor George M. Leader's man on the Delaware River Basin Advisory Committee, the regional group established to explore creation of a multi-state basin management agency. And when DRBC was organized in 1961 at the committee's urging, Dr. Goddard began 18 years' service as DRBC alternate member to a succession of five additional governors. He brought to

DRBC, of which he was chairman pro tem four times and the last original board member to serve, a reputation as one of the era's foremost foresters and conservationists. He exercised continuous leadership in the Delaware River Basin Compact effort both before and after its enactment.

He was succeeded as Governor Dick Thornburgh's DRBC alternate by his long-time friend, associate and top aide, Assistant Secretary Clifford H. McConnell.

H. Mat Adams of New Jersey, another original DRBC alternate and leader in its formative period, died in 1979.



Dr. Goddard

Organization — membership

There was no change in the makeup of the Commission's principal members, who are the governors of the four signatory states, serving ex officio, and U. S. Interior Secretary Cecil D. Andrus, a presidential appointee. Governor Hugh L. Carey of New York was selected chairman and Governor Brendan T. Byrne of New Jersey vice chairman for 1979-80.

Three signatories sent new alternates to the Commission during the year in addition to Pennsylvania. The alternate from the United States, former Governor Sherman W. Tribbitt of Delaware, continued his service.

Thomas P. Eichler, a former New York State environmental official, was named alternate to Governor Pierre S. duPont of Delaware, where he became state environmental control director. The previous Delaware alternate, Austin P. Olney, although no longer on the DRBC board, remained the First State's representative on and chairman of the "good faith" negotiations.

Eldred Rich, assistant environmental conservation commissioner in New York State, took over from Theodore L. Hullar as alternate from Albany.

In New Jersey, Daniel J. O'Hern was

succeeded as both environmental protection commissioner and DRBC alternate member by Jerry Fitzgerald English when he was named personal counsel to Governor Byrne. The governor also provided that either Betty Wilson, deputy environmental protection commissioner, or Dirk Hofman, the deputy director of water resources, should represent the Garden State in Commissioner English's absence.

Philadelphia's acting water commissioner, Kenneth J. Zitomer, is the new advisor to the Pennsylvania member of DRBC, replacing Carmen F. Guarino, the ex-commissioner.

River Conditions

Delaware River streamflows were sustained at healthy normal-or-above levels throughout the year — with one exception.

That exception was the unwelcome high water that followed the nearly three inches of rain that fell all over the basin on January 25, 1979. That storm produced above-flood-stage crests in the Schuylkill and Lehigh Rivers, the Delaware's biggest tributaries, as well as most smaller branches. The Schuylkill went over by two feet at Philadelphia and the

Lehigh by one foot at Bethlehem.

Of the major streams, only the main Delaware failed to reach its 20-foot flood stage, falling short of it by just 15 inches. In the 24 years since the river's worst flood of 1955, this was the eighth time the Delaware had been at least this high without overflowing its banks.

Average flow through the year at Trenton was 70 percent above the normal 10,025 cubic feet per second (cfs), and not once did it drop to the

3,000 cfs level that is the minimum required to protect downstream water quality.

The sustained above-average Delaware flows effectively kept the year's deepest penetration of ocean chlorides far enough down-river — 13 miles below the mouth of the Schuylkill — to prevent any threat to public water supplies in the Camden-Philadelphia metropolitan area.

The 1979 precipitation of 55 inches exceeded the annual average by 13 inches.

The Commission • 1979



Governor Carey



Mr. Rich

New York

Governor Hugh L. Carey
Chairman

Eldred Rich
Alternate

Francis X. McArdle
Advisor

Staff

Gerald M. Hansler
Executive Director

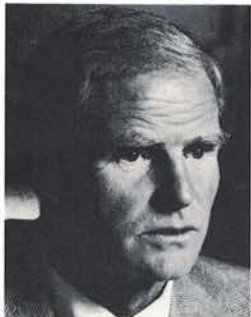
David J. Goldberg
General Counsel

W. Brinton Whitall
Secretary

Dawes Thompson
Public Information Officer

J. W. Thursby
Head, Environmental Unit

Raymond J. DiFrancesco
Chief Administrative Officer



Governor Byrne



Mrs. English

New Jersey

Governor Brendan T. Byrne
Vice Chairman

Jerry Fitzgerald English
Alternate*

Engineering Division

Herbert A. Howlett
Chief Engineer

C. H. J. Hull
Staff Engineer



Governor duPont



Mr. Eichler

Delaware

Governor Pierre S. duPont
Member

Thomas P. Eichler
Alternate

Branch Heads

Seymour D. Selzer
Program Planning

Robert L. Goodell
Operations



Governor Thornburgh



Mr. McConnell

Pennsylvania

Governor Dick Thornburgh
Member

Clifford H. McConnell
Alternate

Kenneth J. Zitomer
Advisor

*Betty Wilson or Dirk Hofman
is to serve as alternate in
Commissioner English's absence



Secretary Andrus



Mr. Tribbitt

United States

Secretary of the Interior
Cecil D. Andrus
Member

Sherman W. Tribbitt
Alternate

Colonel James G. Ton, ACE
Advisor



“Good Faith” Talks

Parties weigh changes in Supreme Court decree

A half-century after the U.S. Supreme Court first established the doctrine of “equitable apportionment” for interstate sharing of the water resources of the Delaware River Basin, prospects are running high that the court’s dated decree may be modernized soon by agreement among the affected parties themselves.

The court first acted in 1931 when New York City’s plan to go to the Catskill Mountains in the Upper Delaware for its future water provisions was challenged by states downstream. The city was granted permission to take up to 490 million gallons daily from the Delaware, in exchange for which a minimum flow had to be guaranteed by the city to satisfy the rights of Pennsylvania, New Jersey and Delaware.

Delayed by the Depression and then World War II, the city’s reservoir and aqueduct-building program did not commence until the late 1940s. By then its water needs projections had grown and in 1954 the court revised the decree. This granted the city’s application for an increase to 800 million gallons daily, or half of its total usage from all sources, and also increased its downstream release obligations correspondingly.

Conferees are N.Y.C. and 4 states

At the formal urging of the Delaware River Basin Commission in late-1978, the five parties to the decree — the four basin states and New York City — entered “good faith” negotiations aimed at amending the court’s decision which, it was known by then, had become obsolete due to post-decree hydrologic developments. The five parties can alter the decree’s terms, but only by unanimous agreement, without going back to the court.

These events led to the negotiations:

First, the drought of the 1960s proved far worse than the basin’s previous worst dry spell on which the 1954 decree revision had been based. The result was a deficit of

about 25 percent in the water allocations allowed by the court. The then-young DRBC, armed with special emergency authority, invoked its drought relief powers in 1965 and effected a cutback in interstate allocations proportional to the deficit. The basin’s record drought thus was survived until nature’s rains brought their own relief, averting possible water supply calamity for both New York City and the Philadelphia-Camden area.

Second, construction of the long-contemplated federal Tocks Island reservoir project on the Delaware main stem above the Water Gap had failed to materialize due to fierce environmental, local and political opposition, leaving the region without the storage capability that could pull it through any foreseeable drought.

Finally, Tocks Island’s foes, still uneasy because the disputed reservoir remained authorized on the federal books, succeeded in having Congress put that portion of the Delaware River in the National Wild and Scenic Rivers System in 1978.

With the Tocks Island coffin possibly nailed shut, Pennsylvania induced its fellow Delaware Basin Commission members to call the decree parties into negotiation. New York City is a decree party but not a DRBC member, while the United States is not a decree party, but is a DRBC member along with the four basin states.

Accord seen on concepts

The talks commenced early in 1979 and were progressing toward numerous agreements by year-end, according to a report by “good faith” chairman Austin P. Olney, Delaware’s negotiator and former DRBC member. DRBC itself has not engaged in the negotiations aside from providing technical services, including mathematical “runs” of the river to produce crucial information on the relation-

ship between flows from upstream and intrusion of sea salts that threaten to contaminate public water supply sources in the Camden-Philadelphia region during droughts.

There was general accord that the allocations granted in the 1954 decree are no longer achievable in event of another drought. There also was optimism about the chances for a five-party agreement that could rescue the region in another water shortage — perhaps spurred by apprehension that collapse of the talks once again could land New York City and the states back in the Supreme Court for costly and lengthy litigation and a forced solution. The hope was for a 1980 settlement in the “good faith” talks.

In an interim report for the negotiators, the chairman said there was agreement there should be measures of “mutual sacrifice” arranged in advance, including specific reductions in both releases and diversions. They hoped to establish precise numerical hydrologic conditions for invoking a formal “drought warning” and more severe “drought emergency,” at which points agreed-upon drought relief measures would take effect automatically, the chairman said. And they concurred that some reservoir construction is essential, that there must be commitments and timetables under which the parties would move forward on the projects, including sharing of capital and operating costs, and that detailed adjustments would be made in future flow manipulation.



Mr. Olney

“Level B” Study

Recommendations made in draft final report

Water management in the Delaware Basin appears headed for a future that will stress conservation, reuse, restrictions and regulations and rely far less upon structural activity.

The tentative recommendations of the three-year investigation that is to help the Commission revamp its comprehensive plan call for a mix of non-structural and limited structural methods to solve future water supply, salinity protection, flow augmentation, flood control and water quality problems.

The investigation is the Delaware River Basin Comprehensive (Level B) Study, the final report of which is scheduled for publication later in 1980. The preliminary and draft final reports both were published in 1979, and each was subjected to intense public scrutiny at information meetings or formal hearings throughout the four-state, 13,000-square-mile basin. These forums — more than a dozen in all — were part of the study's extensive public participation program.

The two interim reports were the work of the special Level B staff, but policy decisions and recommendations in the final report are to represent the judgments and goals of the five voting members of the Commission.

Three plan options offered

Under guidelines of the U. S. Water Resources Council, which sponsored the federally assisted investigation, the draft final report offered three alternative groups of recommendations. One stresses the needs of environmental quality, another is designed to meet national economic

development goals, and the third is a middle-of-the-road “mixed-objective” plan that the report labeled the “most practical combination.”

The recommendations in the final report, in turn, are to be the bases of criteria, standards, policies, programs and projects to be proposed by the commissioners as amendments to update the comprehensive plan, some parts of which date to the first year of the Commission's existence in 1962.

The contents of the comprehensive plan are varied, but the best known are the dozen federal and state reservoir projects that were put into the document in 1962.

Of these, three have been built and are in operation. Two others, including the controversial Tocks Island lake project on the Delaware main stem, neared the construction stage but now appear unlikely to be developed due to intense environmental opposition. Land has been acquired for two others in Pennsylvania and New Jersey. Three others, no longer considered viable, are dormant.

Two of the 12 reservoirs in the plan are existing federal flood control facilities in Pennsylvania long slated for enlargement for water supply. It is these, Francis E. Walter reservoir in the Lehigh and Prompton in the Lackawaxen Valley, along with a new proposal, a private electric utility makeup reservoir proposed for construction on Merrill Creek in Warren County, New Jersey, that have received the principal structural emphasis in the Level B study to date.

Minimum flow studied

To assure that salinity intrusion from the sea during drought does not infiltrate and contaminate ground water sources that supply Gloucester-Camden-Burlington towns along the river in South Jersey, the preferred “mixed objective” plan recommends that the fresh water flow of the Delaware into the tidal estuary at Trenton never fall below an “effective” 3,000 cubic feet per second. The “effective” goal would comprise 2840 cfs in actual flow at Trenton plus conservation of 160 cfs in reduced consumptive water use downstream. This would be guaranteed by tapping some combination of water supply sources to augment the low flows of the Delaware in drought time.

Enlargement of the Walter and Prompton reservoirs and construction of the utility-planned lake at Merrill Creek are offered by the preferred plan as presenting the least objectionable means of storing the supplies needed for a drought. New Jersey's long-contemplated reservoir on the Musconetcong River near Hackettstown is mentioned as another possibility, along with raising the dam at New York City's Cannonsville reservoir on the Delaware's West Branch in Delaware County, New York.

The draft final report did not urge construction of the volatile Tocks Island plan but it did urge that it be retained in the comprehensive plan for a decision whether to build it after year 2000. The other construction-ready dam that has been deferred by controversy is Trexler in Lehigh County, Pennsylvania, and the report suggested that this project be considered

only if a need develops for local water supply. The Army Corps of Engineers now classifies Trexler as "inactive."

Many reservoir ideas dropped

The Level B preliminary report aroused loud public cries in several portions of the basin when it listed for consideration a dozen other sites that had been mentioned as possible reservoir locations in non-DRBC studies, notably as alternatives to Tocks Island in the investigation that was made for the Congress in 1974-75. To the relief of many citizens in Bucks, Northampton, Monroe, Pike and Wayne Counties in Pennsylvania, these were not retained when the draft final report was published later in the year. To varying degrees, the Merrill Creek, Prompton and Walter plans promised to attract continued opposition, however. Also being watched by local citizens are projects under discussion that, however, are regarded as unlikely prospects in Berks and Schuylkill Counties in Pennsylvania and Sussex County in New Jersey.

At the public forums on the reports, the overwhelming emphasis was on unwelcome reservoirs in local areas, although Level B's strong recommendation for more water conservation — up to 15 percent additional — won widespread endorsement.

Here are some of the principal recommendations in the draft final report:

Salinity control and flow maintenance — A river chloride standard with reference to sodium control for public health; a minimum stream-

flow for Delaware at Trenton keyed to chloride-sodium and dissolved oxygen goals; one or more reservoirs to assure the minimum flow in droughts; limits on consumptive uses by big water withdrawers; standby storage as makeup for consumptive losses; a feasibility study of tapping ground waters adjacent to the upper Delaware River for additional flow augmentation.

Water conservation — Stringent standby measures for drought periods; public education program; water-saving plumbing in new and renovated buildings; conservation planning for water supply systems.

Water quality — Higher dissolved oxygen standard in the estuary if achievable and affordable; tightened regulatory measures to produce cleaner waste-water; more concentration on local watershed management to protect ground and surface waters; study of storm-water treatment as alternative to higher sewage treatment; standards, policies and regulations for sodium control.

Hazardous wastes — New collection-treatment-disposal policies and facilities; improved warning system for spills; improved waste pretreatment to remove exotic contents.

Water supply — A management plan and limits on ground water use to relieve stress; consideration of ground water withdrawal charge; more surface-ground water conjunctive use; DRBC designation of

ground water protected area in Triassic region just north and west of Philadelphia; requirement that water purveyors interconnect; approval of Bucks-Montgomery water diversion proposal; development of Evansburg reservoir in Montgomery County, if need arises, for supplemental supplies; study of interconnection between Philadelphia's treatment plants.

Flood loss reduction — Completion of Corps of Engineers' study of cost of most effective mix of structural and nonstructural remedies for main stem; reliance on existing structures, local protection works and strong flood plain management for tributaries; improvement of warning procedures.

Fish and wildlife — A comprehensive instream flow policy and more coordination for fisheries protection, including studies of migrating species and water quality programs.

Recreation — Urban waterfront and "greenway" programs; assist in programs for the upper and middle Delaware; support for New Jersey's plan for Pine Barrens, which include part of Delaware Basin; acquisition of river islands for public uses.

Energy — Power plant siting that would cut both fresh water use and reliance on wet cooling techniques; reduced thermal and consumptive uses through cogeneration; more hydroelectric development.

1980—Year of Decision

By Gerald M. Hansler

Several decisions relating to long-term impact on the use of water resources of the basin will be made in 1980.

They are:

- Final action on the Level B study report which is to serve as the blueprint for major comprehensive plan revision.
- Agreement on modifying the 1954 U. S. Supreme Court decree as the result of "good faith" negotiations to update rights and responsibilities of the five parties so as to reflect current hydrologic conditions in the basin.
- Completion of the Commission's hazardous wastes study which will recommend siting criteria and institutional responsibilities for assuring safe capacity for handling toxic wastes within the basin.

These decisions confronting the four governors and the U. S. Secretary of the Interior will be difficult but necessary in framing water resource management for the Delaware River Basin, New York City and northern New Jersey for the next 20 years.

The Level B study effort thus far has concluded that not all of the major multi-purpose water resource proj-

ects once contemplated in the basin for water supply and flow augmentation will be necessary during the next 20 years. There are several reasons. First, the flow needed to protect Philadelphia's water supply intake is much less than predicted in the early 1960s. Second, the public and parties to the Compact and the 1954 U. S. Supreme Court decree have recognized that a relaxed salinity standard to protect the major New Jersey aquifer (Potomac-Raritan-Magothy) is a justifiable trade-off for a mainstem impoundment. Third, reductions of out-of-basin diversions to New York City and northern New Jersey during drought warnings and emergencies could preclude the necessity for building all reservoir projects now in the comprehensive plan. And, fourth, water conservation measures during normal as well as emergency times can reduce the necessity of additional storage for flow augmentation during drought periods.

It has become apparent through both the Level B study and "good faith" negotiation processes that the Commission should consider state-by-state allocation of future consumptive water use in the basin so that additional permitted water uses do not exceed the amount actually available during periods of drought. Stricter but predetermined gross allocations for each state, based upon need and their individual participation in water resource projects, seems an equit-

able approach to sharing the resources of the basin.

The "good faith" negotiations and Level B study processes have utilized identical technical information upon which the DRBC members or their alternates and New York City can compromise upon the best course of water resource management action for the next 20 years. Most of this information was developed through the precedent Level B study effort. Any additional technical information generated from "good faith" negotiators' requests to the Commission has been available to the public and will be included in the Level B final report. The two processes have merged, and the "chicken and egg" question as to which process should be concluded first has been decided — the "good faith" negotiations.

That is logical. Without unanimity of the parties to the 1954 U.S. Supreme Court decree, Level B agreement would be unattainable on such vital issues as:

- Flow at Montague which has major impact on Delaware mainstem and estuary water uses.
- Reduced diversions during drought warning and emergency periods.
- Support of off-mainstem impoundments to meet current and new uses through the year 2000.

- Conservation releases from the three New York City reservoirs to enhance canoeing and the cold water fishing.

The third major effort to be concluded in 1980 is the development of siting criteria and institutional aspects of the DRBC "exotics" or hazardous wastes disposal study. The New Jersey Department of Environmental Protection has become a major party in this effort and will consider its findings on a statewide basis.

Again, important decisions must be made. First, should the siting criteria recommended in the study report be officially adopted by the Commission and placed in the comprehensive plan, or should uniform criteria be recommended to the individual states for their individual adoption? When the Commission adopts criteria or standards as a matter of policy, the signatory parties must comply with such policy as a minimum. However, they have the option under the Compact to enact and enforce more rigid standards. If this occurred, perhaps one basin state could become the sole candidate for toxic wastes treatment and disposal facilities due to over-regulation by the other states.

Another knotty problem dealing with toxics is the institutional issue. Who should perform which functions in solution of the problem — the private sector, a state agency, or DRBC?

When it comes to the actual siting of facilities, should the private sector use the siting criteria established and purchase property which, hopefully, can clear the myriad of regulatory hurdles before a safe facility is actually constructed? Or should state agencies or DRBC determine and acquire preferred sites? Who then should determine the proper mix of toxic waste-handling activity at a



Mr. Hansler

given site — the free-market sector or government? As to financing the construction of the site — should public funds or private capital be utilized? Operation of a highly complex toxic material-handling facility might logically be handled by the private sector either directly or by contract with a public agency owning the facility. Should treatment/disposal rates charged by the facility operator be

governed by a state agency, such as a public utility commission, or should this be left to the private sector? If treatment/disposal rates are too high, then those who generate the wastes might be more inclined to risk the less expensive "midnight dump" method of disposal.

These questions on resolution of hazardous wastes treatment and disposal are actively being considered not only through the DRBC study, but also by each basin state and the U.S. Environmental Protection Agency. Major legislation has been introduced in New Jersey (S. 1300) and Pennsylvania (H. 1840) addressing the problem. In both processes — DRBC study and the legislative — various interest groups representing the public should realize that decisions must be made soon, so that actual construction of safe facilities can commence.

Commission staff and signatory party agency professionals have labored long and hard on developing sound facts for the "good faith" negotiations, Level B study, and toxic wastes study processes. Many elements in the public interest spectrum have devoted their time, knowledge and opinion to these issues. But probably the most difficult task is that facing the DRBC members and their alternates — weighing those facts and recommendations generated and actually adopting the best compromise course of action.

Other Highlights

Bucks-Montgomery Water Supply

Applications were received from the Neshaminy Water Resources Authority and Philadelphia Electric Company for final Commission approval of the proposed Point Pleasant pumping station, water transmission lines, small holding reservoir and purification plant that are components of the long-planned water diversion system for providing supplies to communities in Bucks and Montgomery Counties in Pennsylvania and the Limerick nuclear power plant now under construction on the Schuylkill River near Pottstown. The environmental review phase must be completed prior to the Commission's consideration of the applications.

Merrill Creek Reservoir

Work commenced and continued into 1980 on the main environmental impact statement and two companion environmental investigations into the application by a group of electric utility companies to construct a large reservoir in Warren County, New Jersey. It would be kept full of Delaware River water for discharge back to the river during droughts. Thus, the facility would be used to make up for evaporative losses from cooling at power plants, protecting the Philadelphia-Camden area from salt water intrusion. The special side studies are looking into geotechnical-safety and historical-archeological aspects of the proposal.

Enforcement

DRBC stepped up enforcement of its rules requiring that developers of large wells and other water-using facilities secure Commission consent before putting them into operation. A half-dozen well owners and waste dischargers were penalized for operating without permits or violating pollution control requirements.

Model Implementation Program

The special study of agricultural non-point pollution sources on the Delaware's West Branch upstream of New York City's Cannonsville reservoir in Delaware County, New York, continued through the year, as did DRBC participation. This is one of seven watershed areas in the nation to receive such a designation, under which existing programs are used to solve local non-point agricultural pollution problems. The results could have basinwide application.

Water Quality Status

For the fifth successive year, DRBC prepared an assessment of current water quality and the degree of improvement. The report covers the 330-mile Delaware main stem from Hancock, N.Y., to the Atlantic Ocean.

Water Quality Standards

The Commission's interstate water quality standards were amended (actually early in 1980) to add effluent

requirements for suspended solids. The comprehensive plan requirement limiting dissolved oxygen impact of a discharge to no more than 5 percent of river dissolved oxygen was deleted.

Flood Plain Maps

Work was completed on maps showing the frequency and boundaries of flooding in 15 more communities. This raises to 235 the number of basin towns with federally sponsored mapping studies completed since 1974 by several agencies, including DRBC. Another 205 are in progress. The maps are an aid to the towns in establishing floodland restrictions and securing national flood insurance for local property owners.

Hydrology Coordinating Committee

This advisory group comprising the five signatories continued its assignment to establish uniform operating criteria under which the basin's resources will be managed. The committee published a report, "Selected Bibliography of Hydrologic Reports and Studies in the Delaware River Basin" with the objective of identifying available hydrologic information in the basin. In 1978, the committee had issued a report on determining basinwide 100-year flood frequency statistics at all key stream gauging stations for use in the federal flood insurance program.

Limnological Studies

DRBC analyzed the water chemistry and bottom organisms at 17 locations along the main stem and tributaries in New York, New Jersey and Pennsylvania as part of the continuing program of adding to biological knowledge of the upper basin and to assess the effects of the trial program of altered downstream releases from New York City's reservoirs. Also conducted was a special survey of aquatic plants from Trenton to the Delaware Water Gap.

Drought Contingency

Work was completed by the special task force created to develop technical options to help DRBC apportion short-supply waters to accommodate minimum needs of both in-basin users and New York City in the event of a severe drought such as that of the 1960s. The assignment culminated in publication of the "Task Group Report, Appraisal of Upper Basin Reservoir Systems, Drought Emergency Criteria and Conservation Measures." More recently the task group has functioned as the technical committee for the "good faith" negotiations on interstate water apportionment.

Salinity Studies

The DRBC's computerized mathematical model of salinity distribution in the Delaware estuary was used extensively to show effects from proposed regulation of streamflows, out-

of-basin diversions, consumptive use and long-term changes in sea level. Results of these studies fed information to the Level B study, as well as to the special task group created to develop technical options for allocation of water among the basin states during future droughts. Model results were also provided to the Corps of Engineers for its study of the economic impacts of salinity on water users along the estuary.

208 Studies

Areawide waste treatment management plans were completed for the New York State portion of the basin, the Kent and non-coastal Sussex area in Delaware, and the Cumberland-Salem and Hunterdon-Warren areas in New Jersey. All 13 such efforts undertaken three years ago by state, county and regional planning agencies covering the entire four-state basin are now completed. DRBC has provided interstate coordination.

Conservation and Reuse

Research on the effects of industrial conservation and reuse on depletive water use and instream requirements was initiated in 1979. The Commission presented testimony supporting legislation in the State of New York to establish new water conservation requirements in that state. Staff work was begun amending the Commission's Rules of Practice and Procedure relating to water conservation.

Estuary Wasteload Allocations and Permits

Using an updated mathematical model of the estuary, the Commission is preparing to consider revision of allocations for the 80-plus dischargers along the interstate tidal river. Continued cleanup of this still-depressed section of the Delaware is vital to enhance shad and eel runs to the upper portions of the basin. DRBC continued its review program of new and updated National Pollution Discharge Elimination System permit applications in all basin states to determine consistency with the Commission's effluent standards and comprehensive planning regarding basinwide water quality objectives.

Hudson River Tap

Following the lead of Governor Carey and New York City, DRBC urged Congress to approve a legislative authorization for the Army Corps of Engineers to undertake a feasibility study of augmenting metropolitan New York City's water supplies from the Hudson River Basin.



Ground Waters

Basinwide probe begun and "protected area" foreseen

The Commission started work this year on a three-year comprehensive investigation aimed at producing a management program to protect the four-state basin's ground waters from depletion and deterioration, especially in the critical problems in Philadelphia's northern and western suburbs.

This long-term effort got under way after the U.S. Water Resources Council and Congress endorsed it and approved federal funding of the cooperative state-federal-commission program.

Meanwhile, pending completion of the three-year investigation in 1982, the Commission also began looking into the advisability of taking special interim protective action to alleviate the excess-depletion conditions in the counties neighboring Philadelphia on the north and west. This is a central-basin area encompassing most of Bucks, Montgomery and Chester Counties and part of Berks in Pennsylvania. Subsurface water storage conditions are poor there due to the characteristics of the red shale formation.

For this area, where more than one million persons reside, the Commission said it would consider a yet-unused legal tool of delineating ground water "protected areas" where special restrictions and regulations may be imposed. The main goal is to protect users of existing wells from infringement of their supplies by new wells. New withdrawals have increased by some 13 million gallons a day in the past five years,

during which subsurface shortage problems have persisted.

DRBC would review smaller wells

The principal provision would extend DRBC permitting powers to cover smaller wells — down to those yielding 10,000 gallons daily — than those of 100,000 or more gallons that are reviewed customarily. Since an average household of four persons uses only 600 gallons of water daily, individual residential wells and those serving small groups of homes would be exempted.

At a series of preliminary public hearings in 1979 on the advisability of making a protected area designation, considerable local support was expressed for the proposal, which still was pending at year-end.

The basinwide ground water work began with preparation of a plan of study that is to be the blueprint for consultants to produce reports for the Commission in 1982 so it can formulate a management plan for the whole four-state region.

Three separate reports are to be prepared — on the ground water-rich Coastal Plain portions of the basin in New Jersey and Delaware; on the mountainous sections of the upper basin in northeastern Pennsylvania and New York; and on the large lowlands area in the central basin that lies to the north and west of the Coastal Plain and tidal estuary that ends at Trenton and to the south and east of the mountainous upper basin.

The middle-basin section includes the proposed protected area, which is to receive special attention on its ability to produce good supplies and on criteria for granting new well permits.

Special emphasis on South Jersey sources

Slated also for added emphasis is the Potomac-Raritan-Magothy aquifer system that is the principal source of public water suppliers for Gloucester, Camden and Burlington Counties in New Jersey along the Delaware. Lowering of water tables and degraded quality have become common in these New Jersey areas where ground waters are vulnerable to brackish water infiltration from the Delaware River and also contamination from wastes deposited on land. In dry spells, when flows in the Delaware fall too low to hold off the ocean's intrusion, the risk of salt water filtering into the South Jersey wells increases sharply.

The Commission already has begun taking steps to help protect the Coastal Plain and lowlands resources by attaching conditions and restrictions to permits for recently approved wells. These include conservation and standby water source measures, metering, monitoring for and repairing leaks, and approval for limited periods. Similar conditions would be considered for the protected area. Also, penalties have been imposed recently by DRBC on parties operating wells without permits, usually in cases that come to light through infringements on neighboring wells.

Hazardous Wastes

New Jersey and DRBC merge their studies

The DRBC study to develop environmentally acceptable facilities to recycle, treat and dispose of hazardous waste materials was expanded in 1979 to encompass all of New Jersey.

Late in the year, the state's Department of Environmental Protection and DRBC merged their efforts so that a single program for collection, treatment and disposal of these mostly industrial residuals can be established. This would serve not only the Pennsylvania, Delaware, New York and New Jersey portions of the 13,000-square-mile river basin, but also the 4,500 square miles of New Jersey that lie east of the basin.

DRBC and New Jersey put together a joint venture on a timetable aimed at having up-to-date treatment-disposal facilities in operation in the early 1980s. David P. Pollison, a senior engineer at DRBC, is program manager.

Wastes could reach 3.5 million tons

The merged program built upon earlier inventory and survey work by the DRBC and New Jersey programs that indicated that hazardous waste totals generated by industries in the basin-New Jersey region could reach 3.5 million tons a year by 1990. The basin total is about four times that of New Jersey. This material does not include

wastewater discharges allowed under government permits.

The hazardous wastes include oils, sludges, air pollution control residues, solvent, filter cakes, catalysts, pickling acids and other industrial by-products and wastes.

The merger occurred as the program entered its post-inventory phase to be carried out in 1980 by consultants and DRBC staff.

This work is to establish criteria for site screening, analyze available technologies and costs, and evaluate options on who should be

designated to acquire sites and finance, build and operate facilities. Among the options are the states, DRBC, private business, a quasi-public agency, or a combination. The program stresses the desirability for material and energy recovery and reuse where possible.

The technical studies are expected to confirm the assumption that considerable additional disposal capacity will be necessary to meet future needs

as industrial pretreatment requirements, air pollution control regulations and industrial growth produce greater quantities of hazardous wastes. Capacity also must be developed — or found — for proper disposal of the residuals that currently are deposited in either known or unknown disposal facilities considered inadequate by current standards.

Public participation is extensive

Once the institutional decisions are made by the states and DRBC and the responsible agency or agencies designated, it is intended that final sites for facilities will be selected and preliminary engineering toward construction and operation will begin.

As with other recent programs and investigations by DRBC that have featured extensive public participation, the hazardous waste effort is a cooperative one in which guidance is provided by a 27-member joint advisory committee comprising representatives from state and federal agencies, industries and public interest groups.

Each major component step in the program is reviewed and discussed with the public at information meetings held throughout the study area.



Mr. Pollison

New Recreation Maps

The DRBC has updated and re-published in waterproof and tear-proof form its popular boating and recreation maps of the nontidal Delaware.

After printing and distributing more than 30,000 sets of the charts that have been used by canoeists and other outdoor recreation seekers since 1966, the Commission revised and redesigned the old paper maps into a more durable package and began offering them for sale this year. The price is \$4.

The four-color maps describe the Delaware in detail for 200 miles from Hancock, N.Y., where the East and West Branches converge to form the main stem, to the head of the tidal estuary at Trenton.

Comprising the package are 10 map segments, each one measuring 11 by

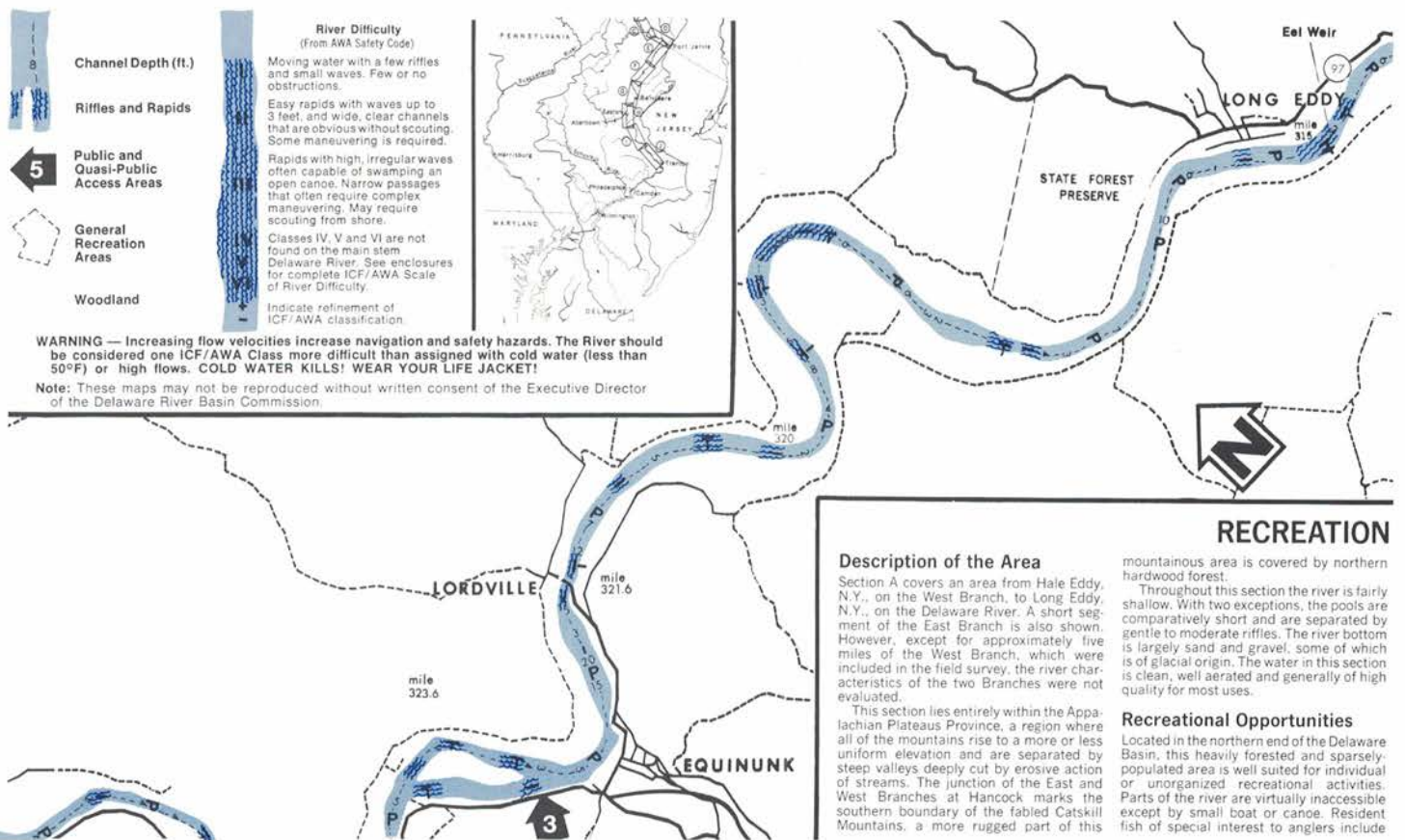
28 inches and graphically depicting about 20 miles of the river, including all pool areas and several classifications of rapids and riffles. They show the continuous river channel, water depths, stream mileage distances, recreation areas, woodlands, tributary streams, and towns, villages and roads near the river. Each segment presents a narrative description of local boating conditions, season-by-season fishing prospects, and shoreline features. The maps pinpoint 45 river access locations available to the public, and accompanying the maps is a list of 26 canoe rental operators, most representing additional river access points. Other enclosures offer boating and safety information.

Another important feature is the new maps' revised classification of rapids and other streamflow characteristics that conforms to the scale of river diffi-

culty established by the International Canoe Federation and American Whitewater Affiliation. This scale had been developed after publication of the earlier Delaware River maps, for which DRBC established its own classifications.

DRBC is indebted to the members of private canoe clubs who suggested the reclassification and contributed their own services by paddling and reassessing every segment of the river at least twice, some up to eight times.

DRBC is exploring the possibility of preparing a companion set of boating and recreation maps for the tidal river, estuary and bay, extending 130 miles from Trenton to the ocean. National Ocean Survey navigation charts are the only aids now available for that reach.



This is a detail of one of the 10 recreational-canoeing maps of the Delaware recently republished by DRBC.



*Chaos reigns, as usual, at the annual Great Delaware River Raft Race a short distance upstream of the Water Gap.
Photo by James M. Staples.*

Hydropower

Responding to a new federal law promoting maximum use of hydroelectric energy, the Commission moved formally to consider generating hydropower in dams that are part of its comprehensive plan.

DRBC enacted a resolution saying it would encourage development of small-scale hydropower at existing and proposed impoundments in the four-state basin. It declared that development of such power should be coordinated with other water uses such as water supply, streamflow regulation and flood control to assure optimum multiple benefits from basin reservoirs.

The comprehensive plan presently contains more than a dozen existing and proposed reservoir projects, but hydropower is a project purpose at only one.

That one is the multi-purpose Tocks Island lake project that has been authorized since 1962 for construction on the main stem of the Delaware just upstream of the Water Gap but which is dormant and may never be built due to intense national environmental opposition. As authorized originally by Congress, only a small amount of hydropower—46 megawatts—would have been generated by water pass-

ing through the 160-foot-high dam. But DRBC and the Congress later amended the plan to incorporate a private pumped storage facility that could produce 1,300 mw through the exchange of water between the Tocks Island reservoir and an adjacent mountaintop pond. This plan is stalled along with the reservoir itself.

As the year ended, DRBC was preparing to seek federal permits and funds jointly with Pennsylvania to study the feasibility of producing low-head hydropower at four dams in the Commonwealth that are part of the Commission's plan.

Sites are in Pennsylvania

The dams are Beltzville in Carbon County; Blue Marsh in Berks County; Francis E. Walter, on the Carbon-Luzerne border; and Prompton in Wayne County, all built by the Army Corps of Engineers. The latter two are flood control-only facilities now under consideration for enlargement to include water supply, while the others are already multi-purpose impoundments.

The feasibility applications go to the Federal Energy Regulatory Commission (FERC), successor to the Federal Power Commission, and com-

panion requests for \$50,000 in study funds for each of the projects are made of the U.S. Department of Energy (DOE). Under its 1979 resolution, DRBC, acting with the Commonwealth, could apply for a building and operating permit from FERC on any of the power projects found feasible in the studies. Also available, from DOE, are 75 percent construction grants. The feasibility study money must be reimbursed on any project where a hydropower plant is installed. Competing applications from local government also went to FERC on two of the projects and from a private concern on one of them.

DRBC's enabling law, the Delaware River Basin Compact, assigns it the lead responsibility to coordinate and integrate the development, management and operation of water resource projects with the five signatory parties. The Compact further allows the Commission to build and operate generating and transmission facilities as well as market the power, but this authority never has been used.

Scenic Rivers

Protection of portions of streams in the Delaware Basin for recreation and scenic purposes continues to enjoy high priority from the Commission and its signatories.

Thirty-two miles of the picturesque Lehigh River — from Francis E. Walter reservoir to Jim Thorpe — were added to DRBC's comprehensive plan as a scenic and wild river. DRBC's action was recommended by the Commonwealth of Pennsylvania and conforms to a measure that was passed by the state Senate and is awaiting action by the House. The designation also applies to parts of 13 streams tributary to the Lehigh, within the designated segment.

Shad

The American shad, the once abundant delight of anglers and gourmets alike along the Delaware, continues its comeback.

A victim of the industrial age and population explosion that ended forever the Delaware's crystal clarity of centuries past, the shad migrations virtually had disappeared in the 1950s and 1960s. But the gradual improvement due to pollution control programs of the river's oxygen content from Philadelphia to Wilmington reopened the door a crack in the 1970s, and prospects are still looking up.

The U.S. Fish and Wildlife Service's special program on the Delaware, which estimates annual shad population through a tagging and recovery technique, is encouraged by the trend of increases, and the last two years' catches at Lambertville by shad-fishing veteran Fred Lewis were double the normal haul and his best in many years.

In April 1979, the Pennsylvania Fish

Late in 1978, Congress incorporated into the National Wild and Scenic Rivers System the uppermost 75 miles of the Delaware main stem that forms the border between Pennsylvania and New York from Hancock to a point near Sparrow Bush, N.Y., and also the 38-mile Middle Delaware that is the Pennsylvania-New Jersey boundary in the Delaware Water Gap National Recreation Area.

DRBC's staff is participating in preparation of the National Park Service's management plan for the Upper Scenic Delaware, which also has been included as a scenic river in DRBC's comprehensive plan. This is a cooperative management planning effort involving, in addition to the federal government and DRBC, local, county and state governments plus an active citizens advisory committee. As such, this intergovernmental approach represents a first for any scenic river or other Park Service activity. The Park Service purchased as an Upper Scenic Delaware feature the Roebling Bridge, at 132 years old

the nation's oldest suspension span, that once carried the Delaware and Hudson Canal across the upper river. It is being restored for use by light motor vehicles.

The Commission provided part of the evaluation team that assessed the Middle Delaware for recreation and scenic designation under the federal system. The river was designated scenic from Milford to Shawnee and recreational from there to the Water Gap. Participating with the Park Service in this determination were state and local people including river experts brought in by the Commission. Pending the outcome of unfinished water resources studies and because the controversial Tocks Island reservoir plan involving that area remains in DRBC's master plan, the Middle River has not received DRBC's own formal scenic river designation.

Also part of DRBC's plan and Pennsylvania's scenic river system for recreation since 1978 is the Schuylkill from Philadelphia to Port Clinton on the Berks-Schuylkill county line.

Commission opened its elaborate new \$550,000 fish "ladder" through the Fairmount Dam on the Schuylkill River in Philadelphia, a few miles up from the Delaware.

The facility has proved successful for many species of fish, but the shad, a

principal intended beneficiary, to date has not made much use of the ladder. The Commission is experimenting with water velocity and other factors to attract the shad and is confident that the species is on the brink of returning to the Schuylkill as on the Delaware.



A tradition for decades has been the annual shad seining operation by Fred Lewis and friends. Photo by Lambertville Beacon.

Conservation Releases from Dams

Upper basin streams improved by three-year trial program

The trial "conservation" release program to improve the principal streams in the upper basin by augmenting their flows from New York City's reservoirs proved successful and was extended another year.

When it was extended in 1979 at the end of the initial two-year experiment, the program had won widespread approval from fishing and boating enthusiasts and local residents and it appeared there would be substantial support for making it permanent in 1980.

An interim performance report prepared by the New York State Department of Environmental Conservation at the end of 1979 said that the trial releases had substantially reduced the fluctuation of both flows and temperature in the Delaware's West Branch and, to a lesser extent, on the main stem of the Delaware where it forms the Pennsylvania-New York border.

The release program offers "tremendous potential" for improving the fisheries of the popular brown trout and other cold water species both in the New York and Pennsylvania sections of the upper basin, the report found, adding that the restoration could be even greater with further increases in the streamflows.

Due to improved conditions in the streams from the increased and bet-

ter distributed releases, economic value of added fishing activity to the upper basin region is appreciating, the report said, adding that the same appears true for canoeing. For example, it noted that two new canoe rental establishments opened in 1979 on the East Branch.

Fishing was reported improving also in warm-water reaches of the upper basin streams where smallmouth bass and walleye are found.

The three upper Delaware reservoirs from which New York City gets about half of its water supply were built in the 1950s and 1960s with the consent of the U.S. Supreme Court. The court had ruled the city was entitled to divert the water out-of-basin but also required it to make enough downstream releases to assure a minimum flow in the Delaware for the water-rights protection of Pennsylvania, Delaware and New Jersey.

Pennsylvania, New York waters benefit

The city was meeting its obligation under the court's decree to guarantee a minimum flow in the Delaware at Montague, N.J., just below Port Jervis, N.Y. Even so, outdoor recreation and sports enthusiasts were complaining that the more than 150 miles of streams between Montague and the reservoirs were suffering due to uneven distribution of the augmented

flows and also the low level of the basic conservation releases. The streams involved are the upper main stem of the Delaware from Hancock, N.Y., to Port Jervis, N.Y., and its three main tributaries in New York State — the East and West Branches and the Neversink River. The reservoirs are Cannonsville, Pepacton and Neversink.

The three-year experimental conservation release program redistributes the "bank" of water that accumulates in the reservoirs in excess of the volumes needed both to supply the city and meet the downstream flow requirement. The trial conservation operation has resulted in sharply increased minimum flows year-round for fishing, boating and other recreation in the streams below the reservoirs.

The program was produced in an agreement among the four basin states and New York City with concurrence by the Supreme Court's river master and adopted formally both by the Basin Commission and the New York State Department of Environmental Conservation.



Estuary Quality

Biggest improvements linked to Philadelphia upgrading

The Delaware estuary's water quality has been improving gradually for a decade, but the cleanup goal set 15 years ago will not be attainable until Philadelphia's city-wide three-plant sewerage system is fully upgraded.

DRBC observations over recent years show that warm-weather oxygen-level depression in the river below Philadelphia is not lasting so long and is not extending so far downstream. Similar findings came this year by the U.S. Fish and Wildlife Service, Coast Guard, New Jersey's Division of Fish, Game and Shellfisheries and others, yet all concurred that the biggest part of the job remains undone.

In mid-1979 came a major breakthrough in the long delays in getting the Philadelphia improvement program going full-steam. Completion of the Philadelphia upgrading originally had been set for 1977 by DRBC, but this plan was derailed through the 1970s due to financing problems and regulatory disputes primarily involving the federal government. The breakthrough was the settlement of complex counter suits between the federal Environmental Protection Agency and the city. The agreement put the program back on track and committed the city to have all three of its big sewage treatment plants fully improved and in operation by 1983. Actually, most of the work had been finished — to near compliance level — at one plant.

Philadelphia is the nation's fourth largest city and contributes about 40 percent of the overall 2 million pounds of raw organic waste-water generated daily — prior to treatment — along

the 85-mile estuary from Trenton to below Wilmington.

Industries and Wilmington complying

Pollution abatement by the lower river's industries is generally up to par. So are some of the public sewage systems, notably the joint Wilmington-New Castle County facility, but others continue to lag along with Philadelphia.

The Philadelphia-EPA agreement, signed also by DRBC, Pennsylvania and the Sierra Club, EPA's co-plaintiffs, called for a \$737 million program of construction and installation of new machinery and equipment, of which 75 percent is to come from federal aid. In addition to setting timetables for the three treatment plants, it mandates that Philadelphia stop its ocean dumping of sludge by the end of 1980, a year ahead of the national deadline.

Most of the work in the \$270 million upgrading at the southwest plant, located on the Delaware below the Schuylkill River, is completed. Treatment has improved from 45 percent removal of organic materials to 85 percent late in 1979. It is anticipated that the city shortly will be meeting Commission requirements for nearly 90 percent removal.

The other two installations are to be operating at full scale in 1983. They are the southeast plant, a \$150 million effort near the Walt Whitman Bridge where building work will commence in a year, and the northeast facility, biggest of the three, which is now under construction. The plants

will process up to 560 million gallons daily of wastewater.

Once the city stops its ocean sludge-dumping, it is to turn to disposal exclusively by hauling for stripmine reclamation and composting, both of which already are being employed to some extent.

Camden moving to abate pollution

Site preparation has begun on upgrading the long-inadequate operation that serves Camden, and improvements to the Trenton plant are well under way. When these and the Philadelphia jobs are completed, they will combine with the modern wastewater treatment plants already operating in Wilmington and in Gloucester and Delaware Counties to bring sewerage operations along the lower river up to parity with the region's industries.

It was in 1967 that DRBC adopted its standards for reclamation of the estuary that were based on an extensive scientific investigation of pollution cause-and-effect conducted by the federal government. The ensuing steps were adoption of regulations and assignment of wasteload allocations to each of the 80-odd dischargers of organic waste-water.

Since that time, some \$250 million in waste treatment facilities have been put into operation on the estuary, mostly by industries. This is double the amount expended as of only four years ago in 1976. By the time upgrading is completed on the lagging municipal facilities, including Philadelphia, Camden and Trenton, at least an additional \$1.5 billion will have been spent.

Financial Summary*

Budgetary

Revenues			Expenditures		
	Budgeted	Received		Budgeted	Expended
Delaware	\$ 118,300	\$ 118,300	Personal Services	\$ 924,165	\$ 924,157
New Jersey	330,100	330,100	Special and		
New York	260,200	260,000	Contractual Services	252,455	252,451
Pennsylvania	363,000	363,000	Other Services	23,905	23,889
United States	295,000	294,750	Supplies and Materials	39,715	39,620
Total from Signatories	1,366,600	1,366,750	Space	149,325	149,285
EPA Grant	207,585	257,667	Communications	42,817	42,784
Special Projects	36,750	36,750	Travel	16,000	15,965
Project Review Fees	26,250	36,260	Maintenance and		
Contractual Services	15,220	15,220	Replacement	19,270	19,258
Interest Income	7,000	30,073	Equipment Purchase		
All Other	3,000	9,576	or Rental	29,805	29,781
Total Revenue	\$1,662,405	\$1,751,696	Fringe Benefits		
Prior Year's Deficit			and Other	142,545	142,412
to Be Funded by			Total	\$1,640,002	\$1,639,602
Current Year's Surplus	22,403	—			
Total	\$1,640,002	\$1,751,696			

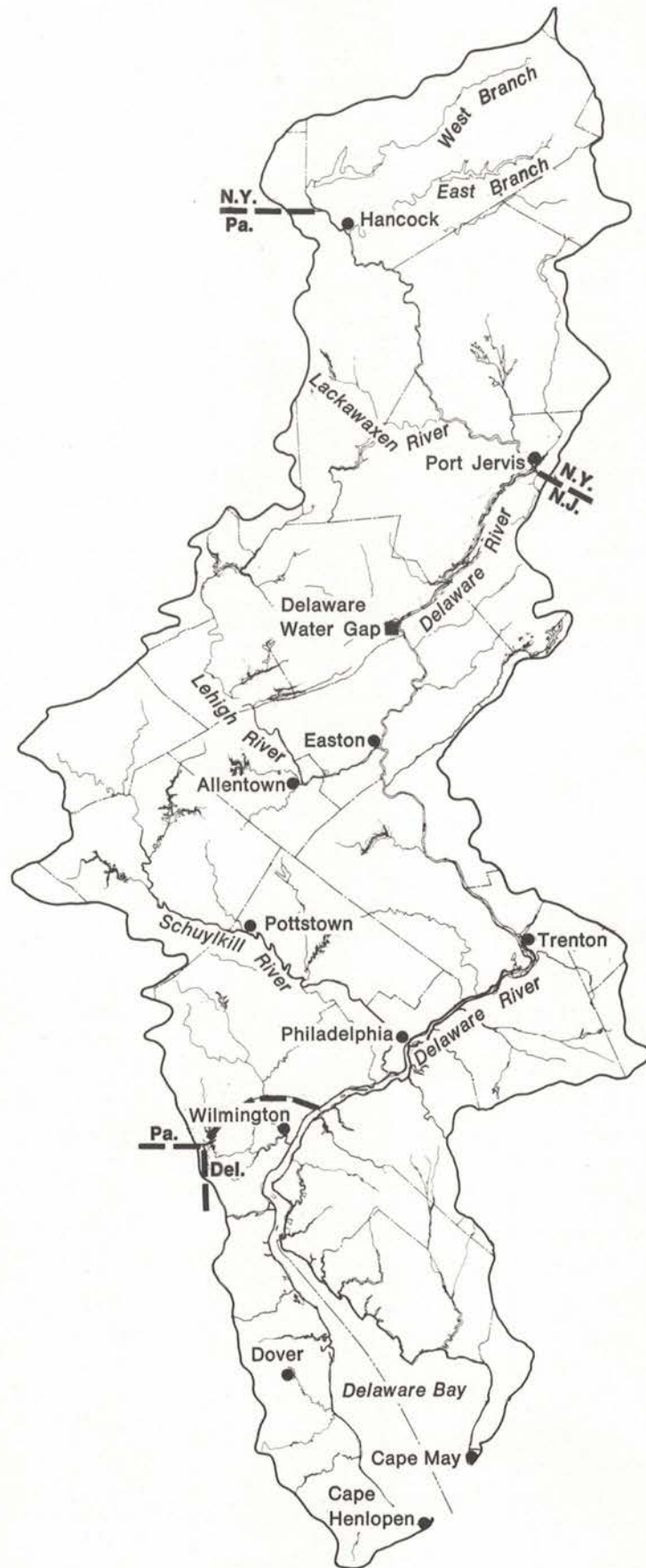
Non-Budgetary**

Special Programs and Projects	Fund Balance July 1, 1978	Revenues	Expenditures	Fund Balance June 30, 1979
Tocks Island Region Environmental Study	\$ 3,146	\$ 0	\$ 0	\$ 3,146
Tocks Island Fish Research	320	0	0	320
Thermal Study	4,393	0	0	4,393
Study of Salinity Intrusion	1,057	20,502	21,559	0
Merrill Creek	0	67,500	27,864	39,636
Flood Plain Contract — Pennsylvania — I	0	28,466	28,466	0
Flood Plain Contract — Pennsylvania — II	0	31,504	31,504	0
New Jersey Coastal Zone	0	8,388	8,388	0
"Level B" Study	546,824	0	415,802	131,022
New Jersey Personnel Contract	0	30,053	30,020	33
Ground Water Study	0	300,000	1,205	298,795
Wasteload Allocation	0	53,000	1,441	51,559
Study of Exotic Wastes — Phase I	25,234	56,567	81,241	560
Study of Exotic Wastes — Phase II	0	18,738	18,738	0
Total	\$580,974	\$614,718	\$666,228	\$529,464

*For Fiscal Year ended June 30, 1979.

**Revenues from sources outside current expense budget

The records of the Commission are independently audited each year as required by the Compact.



The Delaware River Basin

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West Trenton, New Jersey 08628

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