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Cover photo, by Philadelphia Inquirer, shows low flow condition of Delaware in early-July 1965. Scene is looking south toward Trenton from Yardley.

Introduction

This report is respectfully presented to the nearly 7 million citizens and inhabitants of the Delaware River Basin, to the Congress of the United States and to the Legislatures of the States of New Jersey, Delaware, New York and Commonwealth of Pennsylvania. Under the Delaware River Basin Compact, the Commission is the agent of these five signatory governments to insure continuing long-range regional development of the water resources of the Delaware, one of the Nation's vital river systems. It is the only river basin whose water matters are governed under such an interstate-federal partnership.

The period covered by this third Annual Report of the Delaware Basin Commission is the fiscal year that ended on June 30, 1965.

This was the year in which the Commission became fully established, operating with all authorized staff and with much of the difficult ground already having been plowed in terms of molding relations with signatory agencies, legislative and executive officials and with the general public.

It was also the year in which the principal focus was shifted from learning the basin's problems and getting organized to the primary intended function of getting on with resource development.

It was the year that the Commission stepped out in expanding the Comprehensive Plan beyond its original contents inherited from agencies antedating it.

And it was the year that presented the Commission its first major crisis — the 1965 culmination of the basin's worst drought. Although the Commission's first actions to fight the water shortage problems were taken only days before the end of the year covered by this Annual Report, a special chapter is included reviewing the drought crisis situation and activities through early October, 1965 in view of the current interest in the subject.





Governor Hughes



Governor Terry



Governor Scranton

The Commission-1965



Secretary Udall



Governor Rockefeller

Chairman
RICHARD J. HUGHES*
Governor, New Jersey

Vice-Chairman
CHARLES L. TERRY, Jr.*
Governor, Delaware

WILLIAM W. SCRANTON*
Governor, Pennsylvania

STEWART L. UDALL†
U. S. Secretary of Interior

NELSON A. ROCKEFELLER*
Governor, New York

*Ex-Officio
†By appointment of the President

Alternate Commissioners

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New Jersey

NORMAN M. LACK
Delaware

MAURICE K. GODDARD
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SAMUEL S. BAXTER, Advisor

VERNON D. NORTHROP
United States

COL. ELMER P. YATES, Advisor

HAROLD G. WILM
New York

ARTHUR C. FORD, Advisor



Mr. Northrop, Dr. Wilm, Mr. Adams, Gen. Lack and Dr. Goddard

The Staff



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Mr. Miller

JAMES F. WRIGHT
Executive Director

WILLIAM MILLER
General Counsel

W. BRINTON WHITALL
Secretary



Mr. Whittall

ARTHUR E. PEECK
Chief Administrative Officer



Mr. Peck



Mr. Goodell, Mr. Thursby, Dr. Hull, Mr. Howlett, Mr. Briganti and Dr. Lardieri

Planning Division

HERBERT A. HOWLETT
Chief of Planning

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Program Planning Branch

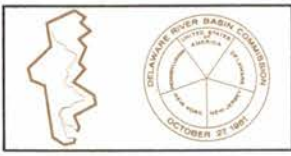
NICHOLAS J. LARDIERI, *Head*
Water Quality Branch

THEODORE BRIGANTI, *Head*
Project Review Branch

ROBERT L. GOODELL, *Head*
Operations Branch

J. W. THURSBY
Staff Economist





The federal-interstate Delaware River Basin Commission passed its third birthday in 1964-65.

As the year began, the groundwork period was largely behind the young agency. Administratively, it was running smoothly. Liaison with agencies of the five signatory parties had been established. Most of the technical planning functions had taken form. Tangible progress on some of the physical projects in the basin had been registered since adoption of the first stage of the Comprehensive Plan in 1962.

As the year ended, the Commission only days earlier had been plunged into the first great public emergency of its young life — the Northeast drought. With the prolonged water shortage stretching territorial water relations to the breaking point, the Commission pursued its opportunity to promote a settlement.

Its ability to keep the peace and help avert through good water planning recurrence of the water shortage of the 1960s could prove eventually to be the toughest early test of the Commission's effectiveness. Indeed, its founders had designed the Commission as a regional public agency with uniquely strong powers to resolve interstate problems stemming from both mutual and rival interests of the very signatories that make it up.

The early history of the Commission already relates an ironic contrast between the 1965 drought and the disaster that helped produce the agency. Although the framers of the Delaware Basin Compact knew the need was for an organization with broad jurisdiction in all fields of water management — and so designed it, it was the cries for flood protection following the devastating 1955 hurricane floods that provided the impetus for creating the Commission. A decade later, the problem was one of too little rather than too much water.

Gov. Hughes the New Chairman

At the annual "summit" meeting at Philadelphia in February, the chairmanship passed from Governor Rockefeller to Governor Hughes. Governor Terry took his chair for the first time as a Delaware Basin Commissioner, having succeeded Elbert N. Carvel as Delaware's chief executive the preceding month. Governor Terry became 1965 vice chairman, replacing Governor Hughes. Of the five original Commissioners, only Secretary Udall and Governor Rockefeller remained. The other original members were former Governors Robert B. Meyner of New Jersey, who left office in 1962, and David L. Lawrence of Pennsylvania — whom Governor Scranton succeeded the following year.

Despite the turnover in three of the five Commission seats, the five original Alternate Commissioners remained on the job another year. It is the Alternates, with full voting powers, who look after Commission affairs on a regular basis and who conduct its monthly meetings. The 1965 Chairman and Vice Chairman Pro Tem, respectively, are H. Mat Adams of New Jersey and General Norman M. Lack of Delaware. Their colleagues are Forests & Waters Secretary Maurice K. Goddard for Pennsylvania, Vernon D. Northrop for the United States and Conservation Commissioner Harold G. Wilm for New York.

In his address as new chairman, Governor Hughes saw the Commission as having become fully established. "It has etched out much of its future role in resource affairs of the basin and has, at this early date, made its presence felt by influencing desirable conservation decisions."

The outgoing chairman said, "the progress made thus far by the Commission and the promise it holds for the future provide testimony to the concept underlying the Compact — a creative partnership among the states and of the states with the Federal Government."

"The problems of today provide dramatic challenge to the federal system of government." Added Governor Rockefeller, "the federal idea involves shared responsibility as well as shared sovereignty, and must never be an excuse for inaction." He called for a similar "partnership approach" for tackling of national water pollution problems.

1964 - 1965 Review - Calm to Crisis



Pictured following the 1965 annual meeting in Philadelphia are Govs. Hughes, Terry, Scranton and Rockefeller and Mr. Northrop, Alternate Commissioner to Secretary Udall.

New Courses, New Policies

The Commission continues to chart new courses at nearly each turn as it sought to put into action the "shared sovereignty" provided for in a compact for which there was no previous model.

Enlargement of the scope of the Comprehensive Plan through inclusion of conceptual goals and policy declarations was initiated early in the year. Previously made up almost exclusively of physical projects, the Plan at year's end contained a rationale for protection and development of hidden ground water resources, a long-range policy under which the basin's water supplies will be greatly enlarged, an upgrading of economic justification in planning reservoir projects, and a wider sanitary waste treatment requirement. (Separate sections appear on the Comprehensive Plan, the new water supply policy and water quality activities.)

The Commission also publishes an annual Water Resources Program based on the Comprehensive Plan presenting a quantity-quality picture of resource needs for the ensuing six years. Among the recommendations in the 1965 Program were the policies added during the year to the Comprehensive Plan on waste treatment and reservoir construction sequence. It also urged early action — taken in most instances — on a number of important reservoir projects. It further called for early acquisition of future reservoir sites, pledged that ground water studies would be expanded, and committed the Commission to implement appropriate policy conclusions of the U. S. Public Health Service's comprehensive study of water pollution in the Delaware Estuary.

The 1964 Water Resources Program urgently had recommended that New Jersey act to acquire the Hackettstown Reservoir site on the Musconetcong River. In November 1964, Mr. Adams reported that the state had moved through its Green Acres program to begin buying the land, thus preserving Northwest Jersey's last outstanding reservoir site and an important feature of the Comprehensive Plan.

The National Recreation Area

After three years as a proposal in the Congress, the plan for a National Recreation Area to encircle the Tocks Island Reservoir project on the Delaware's main stem finally appeared headed for certain approval in 1965.*

*The Delaware Water Gap National Recreation Area plan was enacted September 1, 1965.

When a Congressional Committee asked in the Summer of 1964 that the Corps of Engineers conduct a new land appraisal of the recreation area property to be acquired, the Commission appropriated \$15,000 to finance the study when the Corps revealed that it did not have the funds available. Consequently the land study was ready when due in February.

The Tocks Island reservoir and surrounding parkland inevitably will bring rapid changes and a major economic impact to that region. Working with the Water Resources Association of the Delaware, leaders in the tri-state, six-county impact area neared the finish line in their efforts to create a unique council to provide regional leadership in adjusting to the changes ahead according to sound planning.**

Governor Hughes and Scranton announced jointly at the February meeting a bi-state plan for restoration of the Lambertville-New Hope wing dams under the supervision of the Commission. As the year ended, negotiations were under way for engineering and design work on the project, which will preserve a popular five-mile recreation "lake" on the river above Trenton. Total cost of the job, to be shared by the two states, is expected to be about \$320,000. Existence of the Commission gave the states a ready-made apparatus through which to restore the dams without each having to take individual action.

The Commission's staff complement remained at 39 persons during the entire year, of which 25 carried out the nine programs in the Planning Division. Except for mandated budget increases the expenditures of the Commission retained at the previous year's level.

Cooperating with the program of United Progress, Inc., the organization carrying out the City of Trenton's anti-poverty program, the Commission provided summer-long work and experience for two recipients of the program's assistance.

Under a Ford Foundation exchange program, the Commission benefitted from the services for most of the year of Tarun B. Lahiri, geographer for the Calcutta Metropolitan Planning Organization. He conducted studies of the relationships among physical, demographic and political factors controlling water supply and demand in the basin as a planning region.

**The Tocks Island Regional Advisory Council organized October 16, 1965.

River Conditions

The drought conditions from July 1, 1964 to June 30, 1965 may well turn out, when all the returns are in, to be the worst ever recorded in the Delaware Basin.

Monthly precipitation was below the long-term average for 11 of the 12 months at Philadelphia and Wilmington, for 10 months at Allentown, Reading and in the upper basin above Montague, and for nine months at Trenton. As a result, the low flow record book throughout the basin was extensively rewritten.

October 1964 produced the smallest upper basin runoff — tabulated at Montague — of any single month in more than a quarter-century of record keeping, while the September flow was the second lowest, August the third and November the fourth worst.

The story was similar at Trenton, where the river passes the fall line into the tidal estuary. The May and June flows there were the lowest for those months in 53 years of tabulations. The year also produced the second worst November, March and April flows on record at Trenton, the fourth lowest flows for any September and fifth worst for any October and January. And never before had the levels been so small in April, May and June in the Schuylkill River at Philadelphia as they were in 1965.

In November 1964 storage levels in New York City's Pepacton and Neversink Reservoirs in the upper Delaware Basin were the lowest since they were first filled. The combined storage in this pair of reservoirs each day in December, January, February, May and June was the lowest on record for that date, and the same was true for parts of November and March.

The severity of the salt invasion in Fall 1964 equalled and in some cases exceeded the worst previous year, 1957.

The seasonal decline in the dissolved oxygen content of the estuary — dropping virtually to zero at some times and places — in Spring 1965 occurred earlier than in any recent year, resulting in extensive fish kills in mid-May.



Ground Water

Ground-water levels generally declined during the summer and early fall of 1964, but this was seasonally normal and no unusual long-term lows were recorded at the time. But, by the end of November, normal recovery had not occurred and levels continued to drop. They rose slightly in December and into spring, but levels in many observation wells were below long-term averages. In May, declines resumed and continued to through June, when most levels were below those of the previous drought year and new lows occurred in many observation wells.

Interim Report:

(Only six days remained of the year spanned by this report when the Delaware Basin Commission set into motion its water supply emergency powers on June 23, 1965. In view of the intense public interest in the Northeast drought crisis, the following interim account of the Commission's deep involvement in the emergency through October has been included.)

The Drought

Delaware water is the lifeblood to the basin's own 6.7 million residents and thousands of institutions and commercial, industrial and agricultural operations. It is also exported across the basin border to provide a third of the water distributed to an additional 10 million persons through the vast New York City system. To a lesser extent, water from the Delaware is also canalled into the Raritan Basin to augment supplies for millions of North Jerseyans.

New York City's entitlement to Delaware water and its corresponding obligations for making downstream releases from its reservoirs on Delaware headwaters in the Catskill Mountains are spelled out in a U. S. Supreme Court decree. At the current state of the development of the City's reservoir system, it is allowed a daily diversion average of 490 million gallons and correspondingly must make releases adequate to maintain a flow of 1525 cubic feet a second at Montague in Sussex County, N. J., to satisfy downstream demands.

As calendar 1965 approached mid-point, the Delaware Valley was well into the fourth year of its worst recorded drought. It was the focal point of the entire Northeast drought region. Conservation measures were imposed in some well and reservoir-fed areas served by the Delaware, including New York City. Commercial shutdowns were threatened — and in some cases resulted — from the water shortage. Open burning was banned. There were farmers' hardships and many other effects.

More than 90 per cent of the 300 billion gallons in total major reservoir capacity for water supply storage in the entire four-state basin is in New York City's reservoirs, yet the dry summer of 1964 had left them virtually empty as winter neared. It was hoped that a good spring recovery would relieve the pressure. Instead, March-to-June rainfall was down 50 per cent, leaving only 69 billion gallons as of June 1965 in New York City's Delaware reservoirs with a capacity of 270 billion gallons.

Old Battle Cries Echoed

To avoid further depletion of its already low storage levels in its Delaware reservoirs, New York City stopped making downstream releases on June 14.

Old battle cries rose from the river banks downstream. With releases from the headwaters cut off, the lower basin complained that its supplies could be affected and that the seasonal upstream march of the salt front from the sea would be sped up. Unlike New York City, Philadelphia and most other Delaware Basin cities draw water directly from streams rather than reservoirs.

Thus the outline of the Commission's peace-making mission was clearly etched. Endowment of a strong regional commission with powers to settle water disputes out of court by administrative process had been a cardinal goal of the Compact, and the Commission now had to seek to prevent a recurrence of the very hostilities that had given rise to its creation.

The Emergency Powers

The Compact authorizes the Commission to declare a state of water supply emergency if the need is first substantiated at a public hearing. Under its declaration, the Commission can limit Delaware water diversions and withdrawals.

The Compact also allows the Commission to alter temporarily — by unanimous vote — the terms of the Supreme Court decree on New York City's diversions and releases during a drought emergency.

Armed with these legal tools, the Commission announced on June 23 that it was scheduling a drought emergency hearing for July 7. A fast-moving series of events, still in progress at press time, was thus triggered.

Meanwhile, the Commission and others launched negotiations between New York City and downstream interests in the hope that unanimous

accord could be reached. The sessions culminated with a conference July 1 in the office of Governor Hughes, 1965 Commission chairman, following which a plan submitted by the Commission was taken home for consideration by representatives from New York City.

A Crisis Confirmed

Government, business and civic voices recited in great detail the extent of the water crisis at the July 7 hearing and called for a Commission emergency declaration. No doubt remained that a water crisis was upon the basin.

After hearing a half-day of testimony, the principals negotiated for six hours before the Commission convened the first emergency meeting in its 3½-year history.

By unanimous vote, the four-state basin that is a source of water for more than 20 million persons was declared to be in a state of emergency in light of these grim factual findings:

Basin rainfall to date in 1965 had been 14.5 inches instead of the normal 20; the June river flow had been 2678 cubic feet a second instead of the mean 8600 at Trenton and had been 1231 instead of 4130 at Montague; river flows for each month but one in 1965 had fallen below even the drought levels of 1964; the unpalatable salt front (250 parts chloride per million) had already moved six miles upstream of Chester and the projected rate of advance would take it to Philadelphia's water supply intake at Torresdale by August 15 if unchecked, and that the salt advance also threatened to contaminate the water supply wells of the City of Camden.

Operation "Water Stretch"

Citing the inability of New York City's reservoirs to satisfy both the diversion rights and downstream demands, the Commission reduced New York City's daily diversion right from 490 to 335 million gallons and called for resumption of releases — up to 200 million gallons daily from New York City's reservoirs. This action, of course, necessitated relaxation of the Supreme Court's minimum flow requirement at Montague.

The Commission also authorized the Executive Director to arrange for additional downstream releases into the river from privately-owned hydroelectric reservoirs in Pennsylvania and New York State. Within a few days this was accomplished, thereby increasing daily river flows by 200 million gallons from Pennsylvania Power & Light Co.'s Lake Wallenpaupack in Pike and Wayne Counties, Pa., and by 65 million gallons from the Mongaup River reservoir system of Orange & Rockland Utilities, Inc., in Sullivan County, N. Y.

The emergency arrangement set up on July 7 was the first of three one-month agreements fashioned by the Commission's five signatory representatives and staff with the cooperation of the Supreme Court's River Master and officials of New York City and Philadelphia. The fourth emergency period — 50 days — began on October 10 and extends through November 30.

Each monthly renewal of the emergency provisions produced revisions in the original agreements, based on up-to-date hydrological information at the time. Broadly, however, each was designed to maintain a flow at Trenton, the northern end of the tidal estuary, adequate to slow the advance of the salt front up the estuary.

The first extension of the July agreement took effect August 10 after only slight revision. Still in search of more new water at the time, the Commission also asked the Army Corps of Engineers to start storing water in Francis E. Walter Reservoir, a flood control facility located on the Lehigh River headwaters, and to install the gates needed to permit similar use of the Prompton flood control reservoir in the Lackawaxen sub-basin.

The "Water Bank"

Following up New York City's warning that it soon would be able to make no releases from storage, the Commission met in an unusual session in Washington on August 18 to adopt a "water bank" plan advanced by U. S. Interior Secretary Stewart L. Udall, the Federal Commissioner.

Under this arrangement, New York City went into the September emergency period with permission to "bank" in its Delaware reservoirs all downstream releases that it would have made under the earlier arrangements. The banked water was earmarked for the Commission's "account" for later distribution to New York or downstream, according to need.

New York City stopped making downstream releases from storage on September 7 and began depositing water in the Commission's "account."

Meanwhile, the Commission arranged for more than offsetting the up to 200 million-gallon daily cut in New York's releases by boosting the maximum releases from the private power reservoirs from 260 to 650 million gallons a day and by securing significant daily releases from Francis Walter Reservoir. The power reservoirs were in a position to release more water after Labor Day as summer recreation needs diminished. The September arrangement resulted in a net gain of more than 40 per cent in total downstream releases despite the "bank" buildup in New York's reservoirs.

The Commission's latest emergency action, taken October 7, extended the water "bank" agreement 50 more days through November 30 and at the same time eased somewhat the downstream release obligation of the private power reservoirs. Francis Walter Reservoir continued to contribute to the anti-salt front flows into October.

Action in Washington

The Commission's early emergency actions were followed up by a flurry of summer Executive and Legislative Branch activity in Washington on the Northeast drought. At the hub of the action in the Nation's Capital was the President's Water Resources Council, which toured the problem areas and reported twice to the White House on local action and on what Washington would and could do to help. The Commission's staff was called in by the Council from the start to provide technical assistance.

On August 18, the four Basin Governors and Secretary Udall, as the Commission, held a high-level drought conference with members of the President's Water Council, which Secretary Udall heads. This session produced the "water bank" idea.

The Governors signed a request for designation of the Delaware Basin and its Service Area as a drought disaster area and President Johnson immediately complied by issuing the declaration in their presence at the White House, thereby making federal emergency funds and services available.

At the White House session, the President announced a series of disaster area measures that included installation by the Corps of Engineers of a temporary pump-pipeline system for diverting Lake Hopatcong water to drought-stricken Northeast Jersey; funds to accelerate completion of a new water intake at Philadelphia's Torresdale filtration plant to assure continuing water supplies; and readying a stand-by barge-and-dredge system to reach farther up the Delaware for fresh water to supply Torresdale if the salt front penetrates to that point.

In October, the Congress approved the President's special drought request for \$1.25 million to speed up work by the Corps on five Delaware Basin reservoir projects — Tocks Island, Beltzville, Blue Marsh, Prompton and Francis Walter — all to provide water supply storage. (Prompton and Walter are existing flood control facilities to be enlarged).

Lake Hopatcong Tapped

The Presidential order on Lake Hopatcong led later to an unusual side action by the Delaware Basin Commission. The Commission granted permission in September to New Jersey to make a late-1965 drawdown of 4.3 billion gallons at Lake Hopatcong and to divert the water across the divide into the Passaic Valley. Commission consent was required because Hopatcong is located in the Delaware Basin while Northeast Jersey, recipient of the water, is not. Thus, New Jersey had to win approval of its fellow Delaware Basin Compact signatories to transfer water within its own boundaries.

"Save Water"

As authorized at the July 7 meeting, the Executive Director set up a Drought Advisory Committee of water experts which quickly submitted a series of recommendations. Among them was preparation and distribution by the Commission of a "save water" brochure, which was published in September and distributed to shortage areas.

Fall Situation Better, But . . .

The arrival of fall was accompanied by a good — if still inadequate — boost in precipitation that produced the first sustained period in months in which minimum desired river flows at Trenton were held. As of mid-October, the salt front had been kept more than 10 miles from the Torresdale intake, dropping back five miles more by November 1.

Even some mild gains were recorded in New York City's water storage, and the Commission's "banked" water totaled 2.2 billion gallons and had not yet been drawn upon. But the City's storage levels were down nearly to a third of capacity, compared to a fall norm of more than two-thirds full. The Commission went on record commending New York for cutting its water consumption by about 20 per cent during the summer months. The City also began metering groups of users not formerly covered.

But late in October, the Commission officially alerted all major water users and public and private water suppliers in the basin that there was as yet no meteorological evidence that the four-year drought had ended. The Commission advised all concerned to assume that the drought would continue into 1966.



Looking from Morrisville to Trenton, this is how the Delaware looked in mid-July 1965 (right). Deputy River Master Robert E. Fish ascends tower to check river flow at gauging station opposite Montague, N. J. Bridge downstream links Montague with Milford, Pa. (lower right). The first of many high-level meetings on the Delaware drought took place in Gov. Hughes' office and was attended, among others, by Gov. Terry, far left, and Secy. Udall.



Photo by Philadelphia Inquirer



Photo by New York Times

A broadened scope . . .

The Comprehensive Plan

The keystone to both the immediate and long-range development of the water resources of the four-state valley is the Comprehensive Plan of the Commission. It is so envisioned in the provisions of the federal-interstate Delaware River Basin Compact of 1961, under which the Commission was established.

The Plan is to include all public and private projects and facilities required, in the Commission's judgment, for the optimum planning, development, conservation, use, management and control of the basin's resources to satisfy future and foreseeable demands. The Plan should therefore consist of major physical projects, statements of policy, criteria and standards, and programs to be employed for the basin's development.

It is to be, as defined in the Commission's Rules of Practice and Procedure, "a body of documents expressing a systematic set of policies and programs for the future, and the means of carrying them out."

One of the first official actions of the Commission early in 1962, even before the new agency had any permanent staff, was the adoption of its Phase One Comprehensive Plan. Incorporated into the Plan at the time were eight major reservoirs authorized by Congress later that year; four big state reservoirs in Pennsylvania, New Jersey and Delaware; and eight local watershed developments, cooperative ventures between local groups and the U. S. Soil Conservation Service.

The chapter dealing with the Plan in last year's annual report opened with the following sentences: "The Commission's Comprehensive Plan, which was adopted during the first year of the agency's existence, was neither enlarged nor changed in 1963-64. However, it was a period that produced marked progress on a great number of the physical features of the Plan . . ."

The Commission is pleased to report this year a sharply contrasting picture — one showing the broadening of the Plan into a more truly comprehensive document and more genuinely a planning blueprint, as well as recounting continued progress on the physical projects.

This conversion of the Plan began with the inclusion of a ground water policy.

The Enlarged Plan

This action had the two-fold effect of paving the way for the Commission to make needed studies into the nature and extent of subsurface waters and extending the Plan's legal protection against depletion and contamination to a resource that will become even more vital as the basin's nearly 7 million population continues to expand.

Next, in a move to avoid forfeiting opportunities for developing abundant water storage, came adoption of a water supply policy dealing with federal reservoir projects (see section on Water Supply).

Another addition to the Plan was a pollution control measure requiring a minimum of primary treatment for sanitary wastes discharged into waters anywhere in the basin.

The year's final policy addition to the Plan set up a procedure for scheduling construction of important multi-purpose reservoirs already in the Plan, supplanting the specific target completion dates previously listed. Under this change, the dams are scheduled in sequence for construction as they are justified economically.

Based on present demand data, here is the tentative new construction sequence: *Upstream of the Delaware Water Gap* — first, Tocks Island on the main stem, then enlargement of Prompton, located northeast of Scranton in the Lackawaxen Valley; *Lehigh Valley* — first, Beltzville, then Trexler, Aquashicola and enlargement of Francis E. Walter Dam, all upstream of the Allentown-Bethlehem area; and *Schuylkill Valley* — Blue Marsh, west of Reading, then Maiden Creek, north of Reading.



68 Projects Added

Besides the policies added to the Plan, 68 new physical projects contributing to the basin's control and development were put in the document. These are public works projects in varying degrees of progress ranging from planning to construction, and are mostly sewage treatment works and municipal water wells. They also include development programs for five of the hundreds of local watersheds that go to make up the basin. These projects all are joint ventures between local groups and the U. S. Soil Conservation Service.

Four of the new watershed programs in the Plan are in New Jersey, and the largest is a 10-year, \$7.6 million undertaking involving a series of structures for the multi-purpose control of the waters of Assunpink Creek in Central New Jersey, including flood protection for the Trenton area. Only recently authorized, the Assunpink program now enters the construction stage.

The other New Jersey watershed operations added to the Plan are all well under way. The Pine Mount-Mill Creek Watershed flood protection project in Cumberland County is structurally completed, with only land treatment measures remaining. Flood control and land improvement work in the Middle Neck Watershed of Salem County, started only a year ago, is half finished. A tide gate reconstruction job is in progress in the Gloucester County's Repaupo Watershed.

Also added to the Plan was the Kaercher Creek Watershed project in Berks County, Pa., where a pair of flood dams to protect Hamburg Borough are nearing completion.

Tocks Island

A great deal of public attention continued to focus upon the dramatic Tocks Island project. The Corps of Engineers finished its second year of preconstruction design work and President Johnson asked the Congress for funds for the third. Before the drought emergency raised the possibility of acceleration, Tocks Island construction work had been scheduled to begin in Winter 1967-68.

Meanwhile, increased public and Congressional support for the National Recreation Area plan to surround the Tocks Island Reservoir in what would become the most popular attraction in the entire National Park system appeared to assure passage in 1965 of the three-year-old proposal. Added momentum was provided by the specific support given to the park project in President Johnson's Special Message on Natural Beauty.*

Backers of the \$65 million park had been hopeful for Congressional passage in 1964, but its failure was attributed to its priority place behind the Land and Water Conservation Fund, which since has been enacted, and to the Congress' desire for more detailed land cost estimates.

The Corps of Engineers was directed to update the old land cost figures, since it would do the parkland purchasing for the National Park Service, but did not have funds available to do the work. Concerned that a delay in the land cost study might result in further postponement of Congressional action on the National Recreation Area, the Commission quickly appropriated \$15,000

to finance the Corps' appraisal. The report was turned over to the National Parks Subcommittee of the House Interior and Insular Affairs Committee on schedule in February.

The Subcommittee held hearings both in Washington and Stroudsburg at which overwhelmingly — but not unanimously — favorable testimony was presented. One result of the hearings was an amendment of the legislation to provide some year-round residents within the park boundary the privilege of remaining in their homes for life or 25 years after acquisition. Another change proposed the exclusion of 300 acres from the park to permit expansion of Milford, Pa., and similarly, 1,000 acres to be excluded in Sussex County, N.J. Also proposed were changes in the name of the park from Tocks Island National Recreation Area, as originally proposed.

Reservoir Work Moves Ahead

The first of the eight federal multi-purpose reservoirs authorized in 1962 by Congress for the Delaware Basin moved to the beginning of the construction stage as final design work was virtually completed on Beltzville Reservoir. The first construction contract is to be awarded by Spring 1966. The initial year of design work was finished on Blue Marsh Reservoir, and construction is to start in about 2½ years. It was the third consecutive year in which a major Delaware Basin reservoir went into design by the Corps. President Johnson asked for 1966 funds for continued work on these projects as well as Tocks Island.

Other 1965 developments on big projects in the Comprehensive Plan included New York City's completion of Cannonsville Reservoir on the Delaware's West Branch and New Jersey's decision to begin the purchase of the Hackettstown Reservoir site on the Musconetcong River in Warren, Morris and Sussex Counties. In Delaware, the state assigned development of the Newark Reservoir project to New Castle County, and planning is under way. Pennsylvania finished land acquisition for Tohickon Reservoir in Upper Bucks County and is proceeding with the recreational phase.

Local Watersheds

Eight local watershed programs have been in the Comprehensive Plan since 1962, and two of them were completed that year.

Three of the six still in progress involve flood-scarred sub-basins of the Delaware located in the Pocono Mountains. Work is to be completed in 1966 on the last two of seven dams in the Lackawaxen Watershed, while five of 16 have been completed in the Green-Dreher, where 11 lives were lost in the 1955 floods. Work on the four-dam program for Brodhead Creek, where nine died a decade ago, is to begin in the coming year.

The last of four structures is under way in the Little Schuylkill River control program in Berks and Carbon Counties, Pa., where \$1.7 million in property damage resulted in the 1955 floods. Only channel improvements remain unfinished in the Maurice River project in Cumberland County, N.J.

Ten more watershed programs for Pennsylvania and New Jersey are in the planning stage, while applications are pending for 11 others in both states.

*Renamed Delaware Water Gap National Recreation Area, the National Park proposal was signed into law by President Johnson on September 1, 1965.

The Commission took important policy steps during the year to develop and protect both surface and subsurface water supplies in the basin.

In one of its major actions of the year, the Commission moved in December to insure the inclusion of more than 450,000 acre feet — or 150 billion gallons — of water supply storage in three important federal reservoirs that are nearing construction.

In doing so, the DRBC adopted the long-range policy under which it will arrange for nonfederal water supply to be built into additional reservoirs to be constructed later in the basin. In all, eight federal projects are now planned.

The three projects approaching construction are Tocks Island (to be completed by 1975) on the main stem of the river a few miles upstream of the Delaware Water Gap; Beltzville (ready by 1968) in the Lehigh Valley, and Blue Marsh (finished by 1969) on a Schuylkill River tributary. The latter two are located in Pennsylvania, and Tocks Island will span the river between New Jersey and Pennsylvania. All three will provide flood protection and recreation facilities as well as water supply, and Tocks Island will have the added feature of hydropower.

While the Federal Government pays for flood control and some other features, water supply can be built into federal reservoirs only at nonfederal expense. However, the 1958 Water Supply Act extends long-term low-interest credit inducements to nonfederal sources to use federal reservoirs to meet their water supply demands.

As the construction phase approaches, the Federal Government seeks assurances that nonfederal money will be available to pay for that portion chargeable to water supply. When the Corps of Engineers asked the Commission for such assurances in 1964 on Beltzville Reservoir, the first to be built, a chain of activity by the Commission was set off.

At its initial meeting of the 1965 fiscal year, the Commission for the first time formally assumed its role as the party responsible for financing water supply in federal projects and assured the Federal Government that it would produce funds for water supply at Beltzville.

After months of preparation, a public hearing was held in November on the Commission's proposed water supply policy for federal projects and, following some changes, the document was added to the Comprehensive Plan in December.

How the Policy Works

The policy, a general declaration by the Commission referring to no specific projects, works as follows : (1) Acting on behalf of the Delaware Basin Compact's signatory parties, the Commission will acquire the right to use and control the water supply facilities associated with federal projects in the Comprehensive Plan. (2) The Commission will assume the obligation to reimburse the federal investment for water supply features in federal projects. (3) The Commission will then meet its annual repayment obligations to the Federal Government with revenue raised by either or both of two means . . . through sale of water or other products or services and through apportioning costs to the benefitting states in the Commission's annual capital budget. (4) the states' collective obligation to the Commission then will be reduced as revenues are derived from direct sales to other water users. (5) Finally, the Commission will determine the states in which the general benefits will accrue and apportion to such states their share of the nonfederal water supply costs in proportion to use.

The fullest and most efficient use of resources for water supply, pollution control, flood protection, recreation, hydropower, fish and wildlife preservation and watershed management requires such unified control of the basin's waters. And the Compact equips the Commission to exercise the needed control.

Once the general policy was approved, the Commission was in a position to implement it for the three projects moving toward construction.



Capital Budget

This was done immediately through adoption of the Commission's annual capital budget setting up a water supply fund for the three reservoirs. The fund will receive annual token contributions of only \$2,000 for a few years, rising when the initial payment to the Federal Government becomes due.

Only New Jersey and Pennsylvania will pay into the three-reservoir fund, since they are the only states that stand to benefit from the water supply involved.

The current estimate of total construction cost of the three reservoirs is \$146 million (\$114 million for Tocks Island, \$18.0 million for Beltzville and \$13.7 million for Blue Marsh), of which \$48 million will be for water supply. Including 50-year interest and amortization, these totals will more than double.

Under the formula devised by the Commission, Pennsylvania will pay 71 per cent and New Jersey 29 per cent, based on the states' proportionate benefits in terms of population, per capita water discharge, increased streamflow, and others. The collective obligation of the two states will be reduced correspondingly when the Commission starts collecting money from wholesale water sales.

Governors Scranton of Pennsylvania and Hughes of New Jersey, both Commission members, accepted the policy and financing plan and requested in their 1965-66 budget proposals equal amounts of \$1,000 to start building up the Commission's water supply fund. The requests were approved by the Legislatures.

Projections show that the population of the basin will jump nearly 70 per cent by the turn of the century in 35 years. The water supply envisioned in this policy will help keep the supply in line with the demand not only in the valley, but for the fast-growing population in the basin's neighboring Service Area.

Governor Hughes alluded to such future developments at the DRBC annual meeting in February, when he said of his state's interest in the new water supply policy:

"A Further Share" for N. J.

"For New Jersey's part, it foresees that this action will give it the opportunity before too many years have passed to seek a further share of Delaware water . . ."

The heavily-populated northeastern counties of New Jersey are outside the Delaware Basin. New Jersey now diverts less than 100 million gallons daily from the basin through the Delaware and Raritan Canal.

The broad policy has been adopted and the financing plan on the first three projects has been set in motion, yet much remains to be done on the water supply work.

As the year ended, work neared completion on preparing contracts with the Corps of Engineers on management of water supply at Beltzville and policies were being drawn on arrangements to be made with potential water customers whose water purchases will offset the states' water supply obligations.

Ground Waters

In another major water supply action, the Commission moved to upgrade the status and recognition of ground water, a vital natural resource that often suffers depletion and contamination from neglect or abuse. The coastal plain portion of the Delaware Basin is endowed by unusually rich subterranean water deposits. Camden and many other communities are supplied by ground water.

The Commission extended the Compact's umbrella of legal protection over the basin's ground water resources by adding to the Comprehensive Plan a policy declaration expressly citing the Commission's jurisdiction and interest in preventing harmful influences such as excessive withdrawals and pollution discharges. The Plan's attentions formerly had been restricted to surface waters.

Water Quality



Considerable progress was made during the year on programs to remedy both current and anticipated long-range water quality problems of the basin. The impetus for this forward movement resulted from numerous factors, including the drought and national legislative developments. But for the most part it was generated within the basin community. Rather firm outlines of the water quality program for the basin were emerging as several basic studies and activities approach their climax.

The Estuary Study

The U. S. Public Health Service launched its Delaware Estuary Comprehensive Study in 1962. Its objective is to develop an extensive water pollution control program for the river's tidal stretch below Trenton.

In conducting the study, the PHS is pioneering in the use of high-speed computers in the water quality field. Data for the computers is being obtained from automatic monitors, field sampling programs, and laboratory tests. The procedure permits both short and long-term forecasting of water quality, including the effects of new or enlarged water supply and waste treatment facilities before they are constructed. The study is placing heavy emphasis on forecasting costs of improving water quality and it is seeking the views of a wide segment of water users on the objectives desired. This will enable administrators to make better informed judgments in establishing the final abatement program for the estuary.

The present schedule calls for the PHS to submit a preliminary report in January 1966 citing costs for the achievement of various water quality objectives. This report will be evaluated by both technical and policy-making personnel and the outline of the final program should emerge in the fall of 1966.

The Commission staff, which has assisted in the study, is prepared to assume a significant role in the ultimate implementation of the program. This is in line with adoption of a Commission resolution in February by which the staff was ". . . authorized and directed to receive, review and evaluate findings and recommendations of the Estuary Study and to develop for Commission consideration appropriate policies and programs with respect thereto."

Water Quality Standards

As a functioning water resource agency, it was necessary for the Commission to adopt water quality standards for controlling water pollution and reviewing proposed projects pending development of an overall quality management program. The standards promulgated by the Commission's predecessor organization — INCODEL — some 25 years ago and adopted by DRBC in July 1962 still appeared suitable for this purpose.

It soon became apparent to the staff that there were some significant differences in the manner in which the standards had been applied among the states. The Commission, therefore, approved a staff recommendation that consultation with the signatory parties be established to develop a uniform legal and administrative interpretation of the standards.

Committees of signatory representatives, advisors and Delaware Basin Commission staff members are nearing completion of their assignment. The end-product will include methods for actual evaluation of the degree of compliance with the standards as interpreted as well as the economic consequences of achieving full compliance.

Tributary Treatment Required

An initial pollution control move was made by the Commission in February when it added to the Comprehensive Plan a policy requiring a minimum of primary treatment for sanitary wastes of substantial volume discharged into the waters of the basin. This means that interstate requirements previously in effect on the main stem of the river and tributary mouths have been extended throughout the 12,750 square-mile Delaware Valley.

Stream Studies

The Commission staff, cooperating with Pennsylvania's Health Department and Fish Commission, is conducting an extensive study of the Lehigh River Sub-basin to ascertain the relationships between water quality and biological productivity. The quality of the Lehigh and its primary tributaries is being determined, as are the number of fish and aquatic insects at key points in the river system. Tests are also being made in the Delaware above and below the Lehigh's junction with it. The results of the study should give some indication as to the causes of the apparent suppression of fish life occurring in the Delaware below this confluence. They should also assist the Commission in evaluating various factors related to anadromous fisheries' enhancement and protection.

The staff is also cooperatively engaged with the Pennsylvania Department of Health in a water quality study of the Schuylkill River, the results of which will enable a better evaluation of the low flow augmentation aspects of the Blue Marsh Reservoir, now in final design, and subsequent Comprehensive Plan elements.

Additional water quality protection resulted from exercising of the Commission's project review function, under which all private and public water-connected activities are screened for possible conflicts with the Comprehensive Plan and harmful effects to the basin's resources. Approved during the year were more than three dozen projects relating directly to water quality following findings that they conformed with the agency's requirements. Mostly sanitary and industrial waste operations, they also included a few liquid pipelines and waterfront shipping facilities where the risk of spills requires specialized design.

Muskie Subcommittee

The Executive Director testified on June 3, 1965, at a Philadelphia field hearing of the U. S. Senate Public Works Subcommittee on Air and Water Pollution. The session, chaired by Senator Edmund Muskie, was one of a series of nationwide fact-gathering hearings on the legislative proposals to establish federal water pollution standards and federal grant programs.

At the request of Senator Muskie and in cooperation with the basin states, the Commission staff made cost estimates for municipal sewerage programs that will be required ultimately in the basin. The study revealed that the largest of the expenditures would be for the complete separation of combined sewerage systems. This estimated cost of \$750 million compares with a total cost of \$943 million for separation plus sewerage and treatment facilities.

Since these above totals do not include industrial waste treatment needs, it can be seen that truly substantial sums of money will be required in this area.

Publication of a series of water quality information papers was initiated. The first document described the basin's condition in terms of pollution, and two others were in final preparation as the year ended.

At the close of the 1965 fiscal year, the Commission's water quality branch head, Robert A. Buckingham, returned to his native Southeast to rejoin the staff of the Tennessee Valley Authority. Dr. Nicholas J. Lardieri, who joined the Commission in 1963, was appointed to succeed him.

The Planning Programs

The production arm of the Commission is its Planning Division, in which the Chief of Planning directs the operation of four branches — Program Planning, Water Quality, Project Review and Operations. Staffed by 25 of the Commission's 39 employees, this Division's personnel covers the full range of resource jurisdiction under the Compact. Their work is channeled into nine programs aimed at implementing, updating and improving the Comprehensive Plan.

Information Publications

The Commission initiated the publication of staff papers presenting a thorough exposition of some of the matters before the agency. Several were issued on diverse subjects including interstate cost sharing of water supply, a capital budget plan for financing water supply in three federal reservoirs, the rescheduling of big water control projects and primary treatment of domestic wastes. Also issued were a basin stream mileage system for quick identification purposes, the first of a series of water quality information papers and detailed monthly reports on the condition of the river system. The entire Planning Division funnels material through the Program Planning Branch for publication in the voluminous Water Resources Program, an annual compendium of supply and demand data and six-year program outline.

New Branch Established

The Operations Branch is new. Duties entailed in carrying out the water supply policy adopted in December resulted in its formation, first on an ad hoc basis then permanently at year's end. Robert L. Goodell, a Commission staff member since 1963, heads the new branch, whose duties also include flood protection work. This branch has conducted the drought emergency hydrology studies.

Map Flood Plains

Two of three flood plain mapping studies being carried out with the U. S. Geological Survey neared completion on the Delaware main stem near Easton and Phillipsburg and in the Philadelphia-Conshohocken area. A third, on the Delaware near Belvidere, progressed. A Commission-coordinated compilation of data on peak flood levels also approached completion.

Identify Water Customers

Under the Basin Operations program, the new branch is identifying customers for Commission water supply, for which it will also determine the wholesale cost and devise operating procedures for regulating flows to accommodate both supply and water quality needs. Electronic data processing will help direct the basinwide operating system.

Many other essential, if seemingly routine, activities also important to the surface and ground water supply picture were carried out under two additional programs, Population Analysis and Demands for Land and Water, and Continuing Inventory and Evaluation of Water Supply.

Fish Studies and Recreation Map

Several studies were conducted under the Recreation, Fish and Wildlife program to improve the knowledge of relations between water resources in the Delaware and aquatic life. A new Fisheries and Wildlife Technical Assistance Committee began identifying biological problems requiring research, including any resulting from development of the Tocks Island Reservoir. A recreation map of the Delaware River from Hancock, N.Y., to Trenton is in preparation for outdoor enthusiasts.

77 Water-Linked Projects Cleared

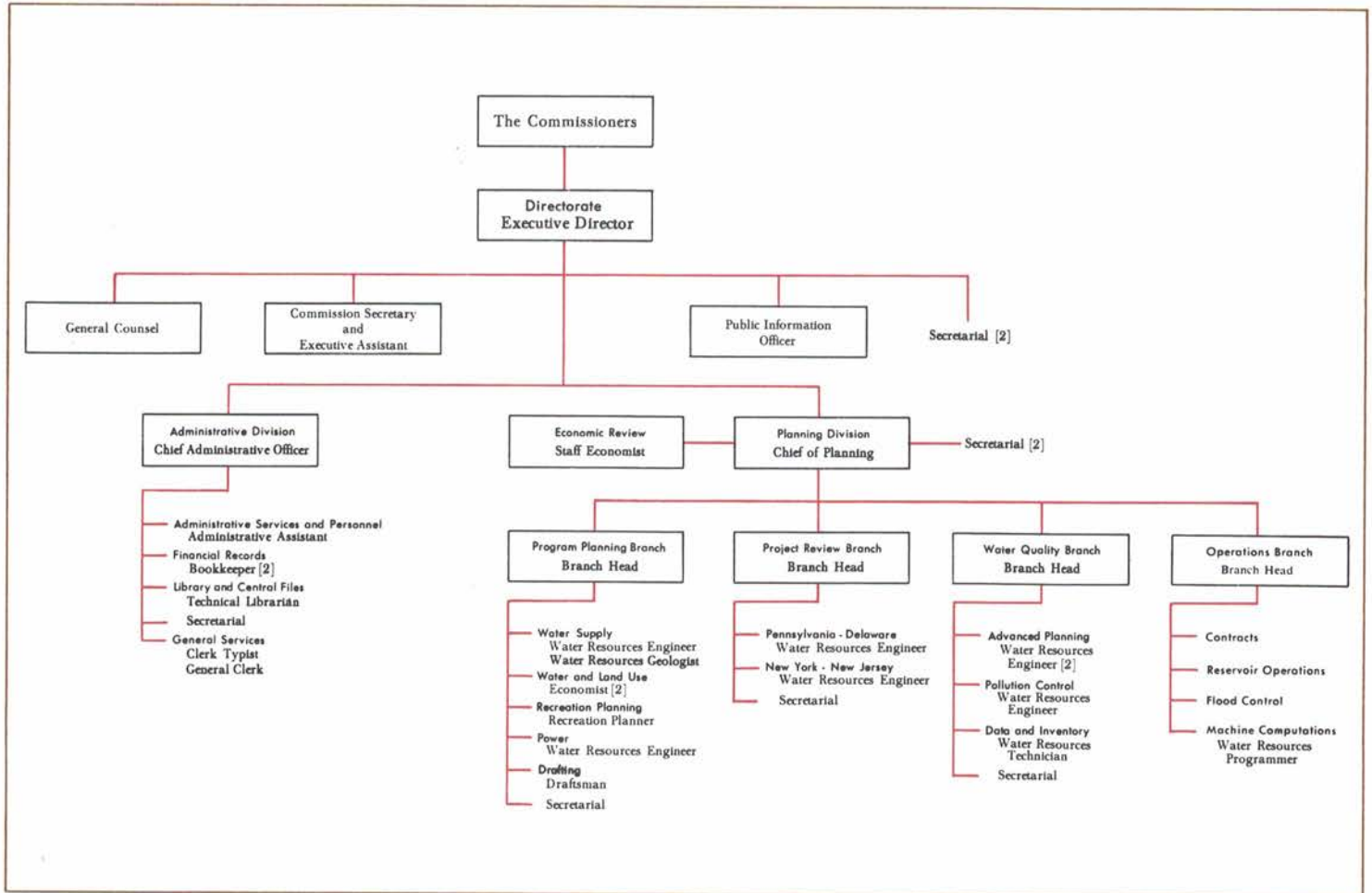
Plans for 160 water-connected projects planned for construction or alteration by either public agencies or private companies came before the Project Review Branch for detailed investigation of their compatibility with the Comprehensive Plan and effect on the basin's water. Of these, 77 were cleared by the Commission, and, as public works, most of the projects also were added to the Comprehensive Plan. They included five surface water supplies, 20 sewage works, 11 industrial waste operations, a water exportation from the basin, and three stream crossings by oil pipelines and nine waterfront navigation projects, mostly checked for risk of spills.

Major developments under the Water Supply, Water Quality and Comprehensive Plan programs are the subject of separate sections in this report.

(The Water Resources Program presents a more detailed account of the activities, findings and production under the Planning Division's programs. It is available for purchase or examination at the Commission's offices.)



The Organization



Budget Distribution

Fiscal Years 1965 and 1966

REVENUES		EXPENDITURES	
1965 (Actual)	1966 (Anticipated)	1965 (Actual)	1966 (Anticipated)
Delaware 16,000	19,500	By Organization Directorate 110,331	114,667
New Jersey 117,000	126,800*	Administrative Division 64,883	71,380
New York 117,000	125,800	Planning Division 360,777	402,603
Pennsylvania 117,000	126,800*	TOTAL 535,991	588,650
U.S. 92,000	96,000	By Program	
Public Health Service Grant 45,452	40,000	WATER SUPPLY	35,951
Miscellaneous 641	2,868	WATER DEMAND	48,148
INCODEL Balance 13,383	0	RECREATION	35,003
Working Reserve 34,500	52,882	POWER	31,163
TOTAL	590,650	PROJECT REVIEW	92,717
552,976	590,650	WATER QUALITY	122,605
		COMPREHENSIVE PLAN	144,756
		FLOOD LOSS	14,209
		BASIN OPERATION	11,439
		TOTAL 535,991	115,800
		Unexpended Balance	18,400
		Capital Program	11,439
		GRAND TOTAL	35,700
		16,985	588,650
		0	0
		552,976	2,000
			590,650

*Includes \$1000 appropriation for Capital Budget

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



**The
Delaware
River
Basin**



