

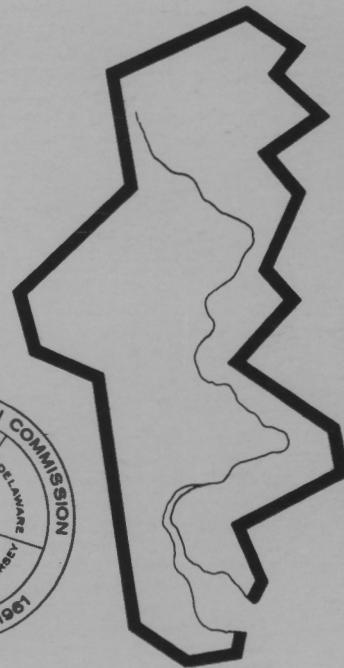
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## Plan of Study

### **Delaware River Basin Comprehensive Study (Level B)**

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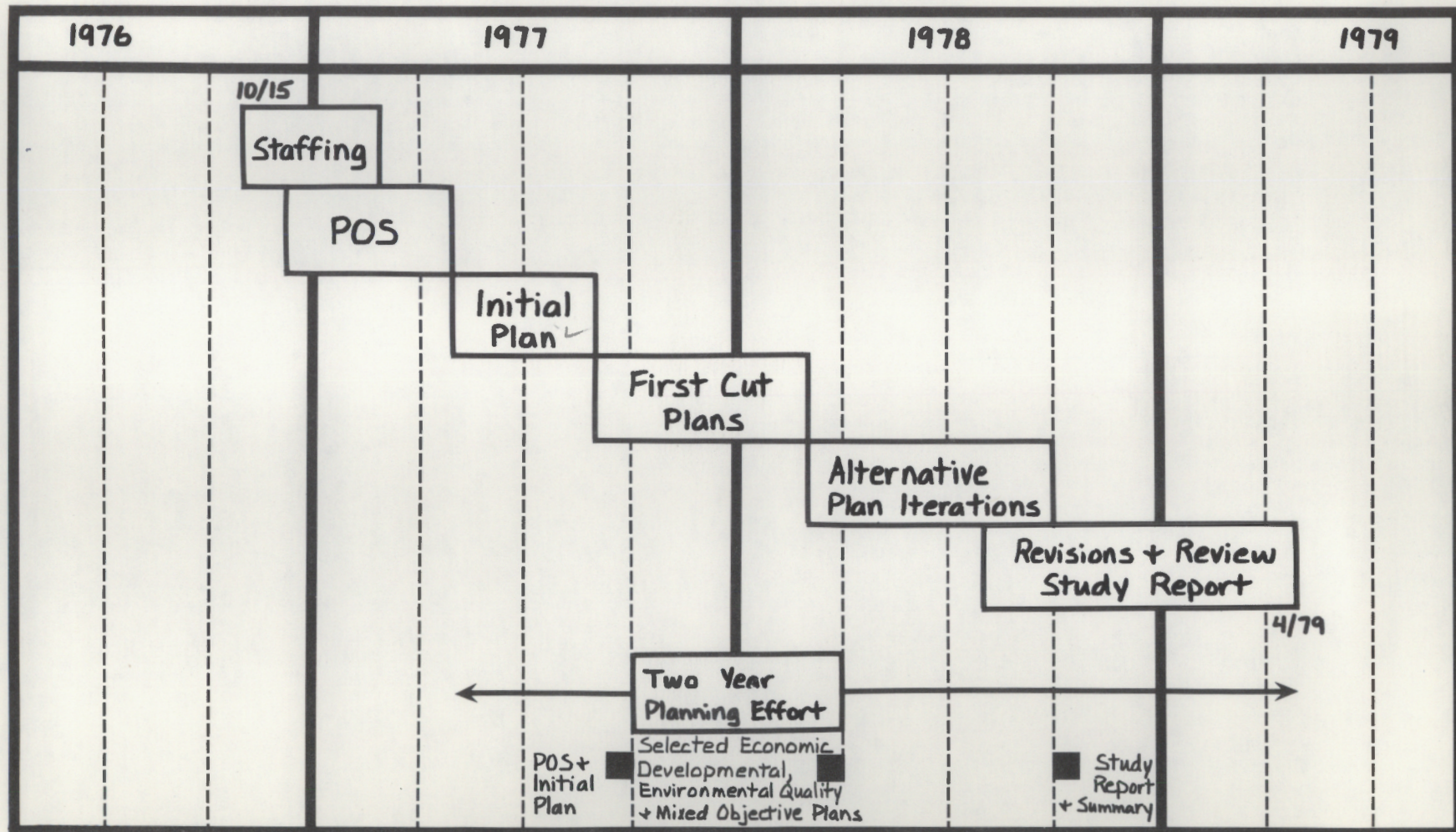
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Frontispiece

# Delaware River Basin Comprehensive Study Planning Process Schedule

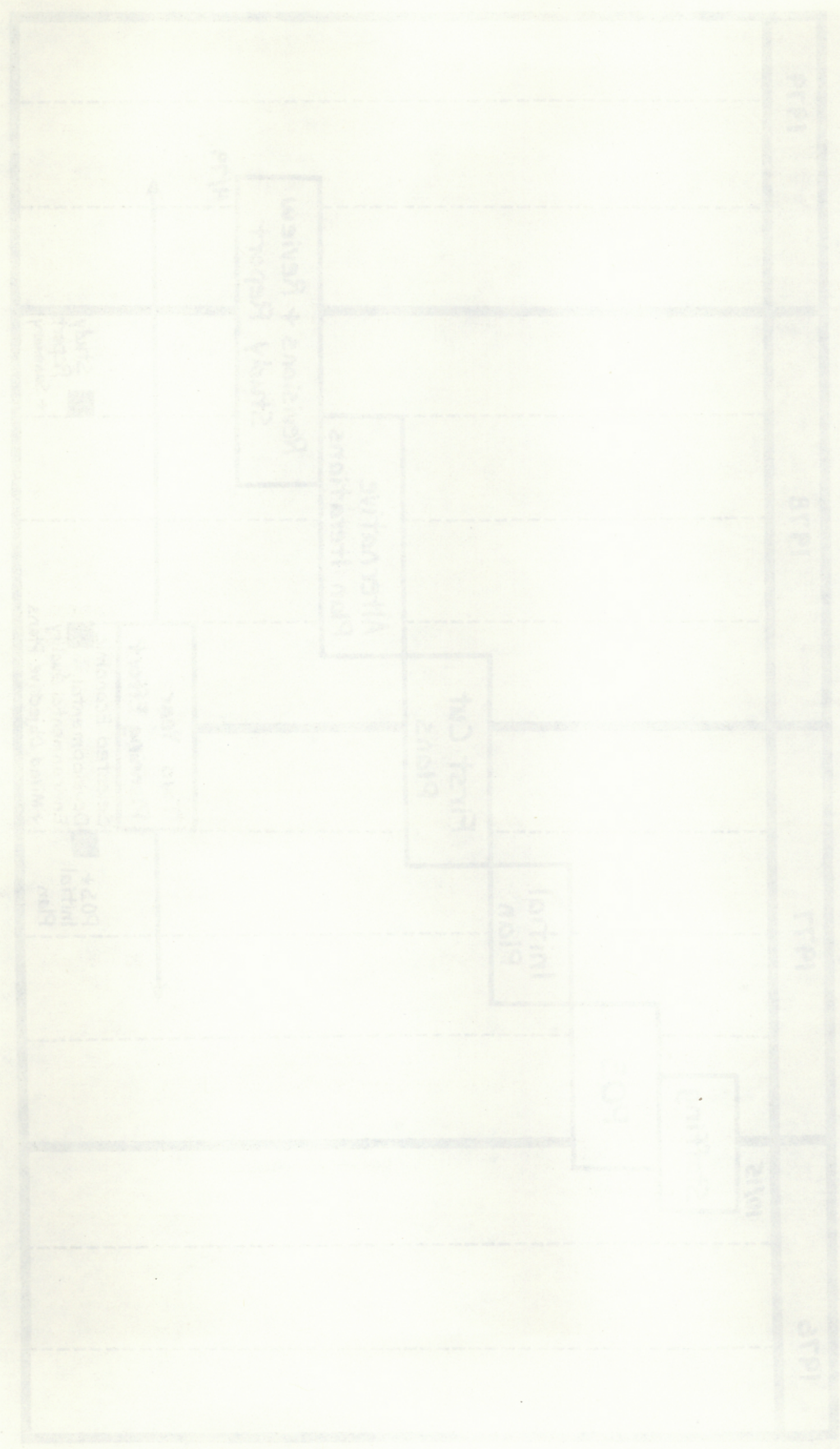


■ Workshops, each consisting of public meetings in the upper, middle and lower basin.



# Diagram

Diagram illustrating the process of photosynthesis, showing the flow of energy and the conversion of light energy into chemical energy.





## EXECUTIVE SUMMARY

The Plan of Study (POS) accompanying this summary is the management document for the Delaware River Basin Comprehensive Study (Level B). The Study was initiated in October, 1976, under a Memorandum of Agreement (MOA) between the Delaware River Basin Commission (DRBC) and the U.S. Water Resources Council (WRC).

A \$1,100,000 WRC federal grant (Section 209, of the Federal Water Pollution Control Act Amendments of 1972), and contributions from the member states and local sources of \$200,000 plus \$232,000 contribution by DRBC, fund the study. Of the total \$1,532,000 for Level B, roughly \$732,000 is allocated to the central core staff and \$800,000 is earmarked for the purchase of specific inputs defined in the POS from participating federal and state agencies. The overall study schedule is shown in the Figure appearing as the Frontispiece to the POS.

As authorized under the Water Resource Planning Act of 1965 and the Federal Water Pollution Control Act Amendments of 1972, Level B's water and related land planning process is in support of water quality management Sections 303(e) and 208 of the Federal Water Pollution Control Act Amendments of 1972 and is designed to address at a reconnaissance level complex water and related land resource management issues for a river basin which require solutions in the next 15-25 years. Within this approach, the Delaware River Basin Comprehensive Study is specifically charged:

- to provide the basis for updating the Delaware River Basin Commission's Comprehensive Plan for the Basin;
- to address federal and state statutory mandates pertaining to the environment and to water and related land resource management and planning; and
- to prepare an Environmental Impact Statement (EIS) for the plans, programs and policies recommended by the study.

The Delaware River Basin Comprehensive Study will comply with WRC's New Approach. Under this guidance, a Level B Study is to be "based largely on judgmental planning, strong central management, immediate and iterative plan formulation (involving public review and feedback), no new data collection, and increased emphasis on participation and leadership of the States." The Delaware River Basin Level B management and public participation structure described in Section II and diagrammed in Figure II-1 on Page II-6 of the POS, assigns clear roles and responsibilities to DRBC, Level B Study Staff, a Study Steering Committee, and Study and Technical Advisory Committees to meet these guidelines.

Most important, Level B's success will be directly related to the public's understanding of the planning process and the plans, policies, and programs it produces. Implementation of the study proposals is dependent on how well these proposals address and meet public needs. To ensure that the planning process will be carried out in an open manner throughout the study, a wide variety of



associations, agencies, and local governments representing diverse interests throughout the Basin in water and related resource management, are being invited to designate representatives to participate as observers at all scheduled Committee and Work Group meetings. These representatives will not only participate if they wish on all Level B working Committees, but constitute the Study Advisory Committee, a forum in which differing views can be discussed and majority and minority positions reached.

A more general citizen information and involvement program will be conducted as well, using news releases, newsletters, and other media. As indicated in the schedule in the Frontispiece, public workshops will be held in the upper, middle, and lower basin areas at three crucial times to consider the outputs of major stages of the study.

Section III of the POS presents the Planning Approach to be followed during the course of the work. In keeping with the guidance provided by the WRC's Principles and Standards, the study will address two major objectives: (1) sound economic development of the Basin's water and land resources to encourage job stability and improved production; and (2) in the development of these resources, to protect and enhance our environment and insure that programs and policies proposed are environmentally sound. These two objectives will serve as integrating forces throughout the planning process, as specific water related problems and needs are investigated. Alternative plans and projects to deal with problems will be evaluated for their contributions to these two objectives for the future of the Basin. The Recommended Plan which will emerge from the Level B process will consist of components to satisfy Basin needs for sound economic growth and environmentally sensitive plans and programs.

Through discussion and review by the Level B and DRBC staff, Steering Committee members, and others concerned with water resource planning in the Basin, the following functional areas have been identified in which to consider specific technical and planning problems: water quality; water supply, including stream flow and groundwater; flood loss reduction; recreation, fish and wildlife; energy, and navigation. Focuses of concern within these areas are identified in the discussion in Section III.

It is clear that limits of time and funds prevent the study from developing an encyclopedic program addressing in detail every water related issue in the Delaware Basin. It is, therefore, essential that most attention be directed to the three or four major problem areas likely to be of most concern to the Basin as a whole over the next 15-25 years. Accordingly, a general consensus of study participants was reached that efforts should be concentrated on water supply issues, particularly with respect to groundwater management, on conservation and management of the environmental resources of the region, and on re-evaluation of several proposed multi-purpose projects which have not reached the construction or land acquisition stage.

Work in this latter category will include review of several U.S. Army Corps of Engineers (COE) sponsored reservoir projects now included in DRBC's Comprehensive Plan, and of State sponsored projects. The results of this review, in



conjunction with investigations of water supply needs, flow requirements, conservation programs, and the feasibility of innovative approaches to water supply management, will provide a context in which to determine the validity of alternatives in meeting the future water needs of the Basin.

Considering only those funds specifically allocated to the analysis of specific technical and planning problems in functional areas of water and related land management, the relative emphasis among major work areas is as follows:

<u>MAJOR WORK</u>	<u>PERCENT</u>		
Integrative Forces (NED & EQ)	20.4		
Water Quality	11.4	} 48.6	73%
Water Supply (Supply, Stream Flow and Groundwater)	31.1		19%
Flood Loss	6.1		14%
Recreation, Fish and Wildlife	9.5		13%
Energy and Navigation	8.8		
Evaluation of Proposed Projects	12.7		
	100.0		66.9

Section IV of the POS lists the technical work elements to be performed under all the categories discussed above. In many cases, particularly for areas which have not been selected for strong emphasis, the work envisioned will consist of a review of existing studies and proposed plans and programs, and an evaluation of their likely effectiveness in meeting Basin-wide needs.

The accompanying Table using data presented in Section IV, shows the budget allocation for Level B staff, States (collectively), and Federal agencies for each functional area. The table shows the role and funding support for each participating Federal agency. Within sixty days after the approval of the POS, the Steering Committee member from each state, with concurrence of the Study Manager, will define his individual State's role, including the allocation of both in-kind and study coordination funds to specific Level B work elements.

Table VI-2, in Section VI, in addition to a summary of the budget information above on technical work elements, shows budget allocations related to other items such as support of the Study Steering Committee, and administrative and coordination costs. Other tables in this Section identify specific work items to be performed by the various Federal participants, and the estimated costs of each. A reasonable degree of flexibility will be allowed in actual costs allocations, with the concurrence of the Level B Study Manager.



BUDGET ALLOCATION FOR LEVEL B STAFF, STATES AND FEDERAL AGENCIES BY FUNCTIONAL AREA<sup>1</sup>

(IN THOUSANDS OF DOLLARS)

Functional Area	Level B <sup>2</sup> Staff	States	USDA	COE	DOI	FPC	DOC	DOT	TOTAL
Economic Development	38	14	26						78
Environmental Resources	84	18	31		8				141
Water Quality	70	7	45						122
Water Supply	75	19	25	3		3			125
Stream Flow	44	17			10				71
Groundwater	49	14		35	40				138
Flood Loss	48	7	2	9					66
Recreation	22	7			25				54
Fish and Wildlife	14	16			18				48
Energy	18	11				13	5	5	52
Navigation	25	8		10					43
Evaluation of Projects	65	16		55					136
TOTALS	552	154	129	112	101	16	.5	5	1074

<sup>1</sup>Shows only funds specifically allocated to analysis of technical and planning problems.

<sup>2</sup>Level B staff will both direct the input of State and Federal agencies and provide supplemental staff input to complete the work elements in the functional areas.



Section V describes the phasing and scheduling of the planning process, and the make-up of the Work Groups which will be assigned to various tasks. Completion of the POS marks the close of Phase I of the study. During Phases II and III, an Initial Plan will be compiled from on-going agency programs. It will present the basin planning setting in the absence of the Level B study. A series of alternative plans will be developed addressing identified needs with varying emphasis on economic development and environmental quality. In Phase IV a Recommended Plan will be made up of the alternatives selected as best reflecting both economic development and environmental quality summarizing the phasing of this planning process. Public involvement and input will be sought throughout the process; as noted in the Frontispiece Table, public workshops will be held at major points.

Section V also identifies the responsibilities of the various study participants. Table V-1 summarizes the representation of federal and state agencies on the Work Groups which will be responsible for developing specific planning alternatives and synthesizing them into a basin-wide plan. Finally, Table V-2 presents estimated completion dates for major planning activities.



## PREFACE

### BACKGROUND OF THE DELAWARE RIVER BASIN LEVEL B STUDY

Two federal acts establish the general scope and purpose of the Delaware River Basin Comprehensive Study (Level B), and define its relation to water quality planning in the Basin:

The Water Resources Planning Act of 1965 (P.L. 89-80) established the U. S. Water Resources Council (WRC) to encourage the conservation, development and utilization of the Nation's water and related land resources on a comprehensive basis through coordinated planning by the federal government, states, local government and private enterprise under river basin commissions as the coordinating agency for basin level planning.

The Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500) legally established the national goal of clean water by 1985 to protect public health. It provided for achievement of this goal with facilities and regulatory programs to control the discharge of pollutants (point and non-point sources). Included in these programs are water quality management planning (Section 208 and 303~~e~~<sup>1</sup>). Finally, river basin level planning, Level B (Section 209) is authorized to be undertaken by the U. S. Water Resources Council under their legislative mandates for all basins in the Nation by 1980.

Congress made its intent clear. Water quality management planning and Level B are mutually supportive and complementary. Water quality management planning essentially has the single objective of meeting approved water quality standards through facilities and regulatory programs to control the discharge of pollutants (point and non-point sources). Level B, on the other hand, is multi-objective, to enhance National Economic Development (NED) and Environmental Quality (EQ) by planning water and related land resources for multi-functional programs to meet needs and solve problems. Alternatives are evaluated in terms of the beneficial and adverse impacts on NED, EQ, regional development and social well-being.

Level B planning is intended by Congress to be one means by which water quality and development considerations related to water and related land resources are to be reconciled to provide a coherent basis for resource management. Resolution of conflicts between water quality and other considerations must take place through the comprehensive coordinated Level B planning process and the final Level B plan for the basin must comply with approved water quality standards for the basin.

This Plan of Study (POS) outlines the goals and objectives of the Delaware Basin Level B Study, and the work elements designed to address them. The Appendix includes certain background materials, a glossary and a list of the references cited in the text.



I. Introduction: The Delaware River Basin Comprehensive Study (Level B)

On October 15, 1976, the DRBC and the U. S. Water Resources Council (WRC) entered into a Memorandum of Agreement (MOA), based on a Planning Proposal (PTS) prepared by DRBC presenting the need for Level B planning for the Basin. The summary of the PTS is quoted below:

*"The Delaware River Basin, a four state region, faces complex problems related to the rapid development of land, and consequent demands and stresses on the quantity and quality of water. The Basin's water-service area includes 25 million persons, one-eighth of the nation's population. Total water use is about 4.1 billion gallons per day, over twice the minimum seven-day runoff from the entire Basin, indicating substantial reuse. There is an immediate and growing need for integrated land-use management, increased water supply, water quality improvement, stream-flow regulation, flood-loss reduction, and recreation development. The Basin community faces policy decisions regarding the use of water and land resources that will permanently affect the national and regional economy and the quality of life in the Basin. A Level B study of the Basin's land and water resources is needed to establish priorities and illuminate alternatives for water and land development to guide amendments to the existing Comprehensive Plan, a legally enforceable management tool under the Delaware River Basin Compact." (DRBC, Planning Proposal, 1975, p. ii)*

Funding for the study amounted to \$1,100,000 total federal share (Section 209 of the FWPCA, 1972) and contributions from the member states and local sources of \$200,000 plus \$232,000 contribution by DRBC. Of the total of \$1,532,000 for Level B, roughly \$732,000 is allocated to the central core staff and \$800,000 is earmarked for the purchase of specific inputs defined in the Plan of Study (POS) from participating federal and state agencies.

The Level B study has been directed:

- To provide the basis for updating the Commission's Comprehensive Plan for the Basin.
- To address federal and state statutory mandates pertaining to the environment and to water and related land resource management and planning.
- To prepare an Environmental Impact Statement (EIS) for the plans, programs and policies recommended by the study.

It was further agreed that the study will be conducted in accordance with WRC's New Approach to Level B, which "is based largely on judgmental planning; strong compact central management; immediate and iterative plan formulation (involving public review and feedback); no new original data collection; and increased emphasis on participation and leadership of the States."\* This New Approach was developed by a Task Committee whose report was adopted by WRC on October 17, 1973. (See Appendix)

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\* WRC Second Annual Report to Congress on Level B (209) Planning, 1974



The Water Resources Council has established Principles and Standards for Planning Water and Related Land Resources which provide guidance to defining goals and objectives for the study effort. State and regional policies are also important. The final study report will be transmitted by DRBC to WRC for review, and submittal to the President and the Congress.

In general, the geographic area to be addressed by the tasks in the study is the Delaware River Basin. However, for some study elements, water supply and recreation for example, activities outside the Basin may raise significant issues within it. The area of study concern will, therefore, be expanded where needed to deal with these topics adequately.



## II. Study Management and Public Participation

While the general management of the Delaware River Basin Comprehensive Study (Level B) is defined by laws and agreements, the detailed management responsibilities and organizational structure must be designed to facilitate carrying out the work program and to encourage cooperative participation in the planning process. Commission and committee structure, as well as the functions and roles of Level B Study participants, is described below.

### A. Structure and Function

#### 1. The Delaware River Basin Commission (DRBC)

The Commission is responsible for all amendments to the existing Comprehensive Plan, which is a legally enforceable management tool under the Delaware River Basin Compact. It, therefore, follows that the Commission under the Level B Study agreement with the Water Resources Council (WRC) is responsible for the development and approval of the Level B Plan of Study (POS) and its implementation especially those portions directly related to the DRBC's Comprehensive Plan. The Commission, with concurrence of WRC, selects the Study Manager, who is assigned lead responsibility for development and implementation of the POS and is directly responsible to DRBC. The Commission serves as fiscal agent for the study and will transmit to WRC the final Level B Study report.

#### 2. Study Steering Committee

The membership of the Study Steering Committee consists of designated representatives from the States signatory to the Delaware River Basin Compact, and eight Federal agencies involved in water and land resource planning and development programs. State representatives without exception are drawn from the Departments managing water and related programs and charged with the responsibility to maintain the State's environment. Federal agencies represented are the U. S. Army (Corps of Engineers), U. S. Departments of Interior, Agriculture, Commerce, and Housing and Urban Development, Transportation, U. S. Environmental Protection Agency, and the Federal Power Commission. A list of the State and Federal participating agencies and their designated representatives and alternates is included in the Appendix. The Steering Committee, chaired by the Study Manager, is the policy advisory body for the Level B Study and for the DRBC. State and Federal representatives also will be responsible for providing information in accordance with the specific State and Agency work plans, for providing review comments on draft material prepared by Level B staff and work groups; and for participation in meetings of subcommittees and any assigned supporting technical committees. In particular, members of the



Steering Committee will provide for the interagency coordination required between ongoing study programs under their respective agencies and the Level B Study.

### 3. Level B Study Staff

The Study Manager and staff under the DRBC have the lead responsibility for developing the POS (in cooperation with DRBC staff in integrating study activities and products with the Comprehensive Plan) and for the implementation of the work activities described in the POS. Once the POS is approved by the DRBC, the staff using directives of the Commission, and guidance and ideas from the committees, will prepare draft materials for the plan formulation process. The staff is responsible for typing, illustrating, printing, and distributing all draft reports and the final report, and is responsible for materials needed to support the public participation program.

### 4. Study Advisory Committee (SAC)

The SAC membership is open-ended and comprised of representatives from organizations and agencies representing industry, commerce, and environmental groups and local government in the Basin who actively wish to participate in the Level B Study. While the Committee's functions are defined more broadly under Public Participation (below), its major management function is to act as an informed citizens' advisory group in obtaining and articulating the general public's views and desires with regard to the Level B Study and advising DRBC, the Steering Committee, and the staff of its findings and aspirations. Involvement will be on a continuing basis. Members will receive all Level B memoranda, minutes, and notices of meetings. On specific request to Level B, any association or agency will be added and invited to participate.

### 5. Planning Agencies

Multi-county regional planning and development organizations and other interested planning agencies within the Basin are invited to participate, to review and comment on all draft materials, to provide existing relevant information on their regions, and to send representatives to meet with various committees as appropriate. Arrangements will be made with each to provide, if necessary, special tabulations of pertinent data and their assistance in the public participation program.



## 6. Technical Advisory Committees

At various times, the DRBC has established and worked with both standing and ad hoc advisory committees and task forces. These committees, including the DRBC Water Quality Advisory Committee, Fisheries and Wildlife Technical Assistance Committee, Delaware Estuary Committee, and Hydrology Coordinating Committee, to avoid duplication and waste of technical resources will be requested to respond to matters pertaining to the Level B program. Additional technical committees, if necessary for the work program, will be established on an ad hoc or on an as-needed basis by the Steering Committee.

## 7. Coordination with Water Resources Council

The Water Resources Council will receive a Commission-approved Plan of Study and a First Cut Plan for information, and the final report for review, comment, and transmittal to the President and Congress. Further, the Council will be included in general mailings, and receive for information all significant documents.

## B. Public Participation

Level B's success will be directly related to the public's understanding of the planning process and the plans, policies and programs it produces. Ultimately, implementation of the study proposals is dependent on how well these proposals address and meet public needs.

It is, therefore, essential that Level B for the Delaware Basin have an effective public participation program consistent with the national policy stated in the Federal Water Pollution Control Act Amendments of 1972, that public participation shall be "encouraged and assisted" in all programs established by the Act. To be effective the program's design must recognize that: (1) There are many diverse public groups, including governments other than federal and state, with different concerns for the management of the Basin's resources that should participate and that such participation is essential throughout the process; (2) there are time (two-years), fiscal (\$1.5 million), and scale (seven million population and 13,000 square miles) constraints which must be realistically faced; and (3) the planning process should be open to the public.

Accordingly, public participation in this study will be approached on two levels: first, through direct and extensive involvement of associations and agencies which have interests and concerns in water and related resource management in the Basin; and second, through the news media and by newsletter and workshops for the interested citizens of the Basin.



1. Level One

Invitations will be sent to associations and agencies representing the diverse interests in water and related resource management in the Basin, including industry, utilities, and environmental groups, state and city Chambers of Commerce, all designated A-95 clearinghouse agencies (responsible for advising local governments of actions concerning them) and regional planning agencies and similar organizations in the Basin. Groups who respond favorably and participate will be asked to designate a member (and alternates, if desired) to represent the association or agency; other groups might wish to be continued on Level B mailing lists and receive information. Designated representatives will receive notices of all Level B meetings, minutes and other materials, and will be invited to attend as observers all Level B meetings, including Steering Committee, Work Groups and Technical Committee meetings. It will be the Level B policy to provide time at each meeting for full participation by observers in the deliberations and discussions.

2. Level Two

In addition to the working relationship established with associations and agencies, Level B will undertake the following activities to provide general information on study progress and plan, policy and program proposals to citizens who have interest in Basin-wide concerns: newsletter, workshops, news releases, television and radio, and distribution of a brochure describing the study's objectives. Use of these communication media will be coordinated with the output of the several stages of the planning process.

3. Study Advisory Committee (SAC)

Representatives of lead agencies (defined as those who actively participate) will be invited to form a Study Advisory Committee (SAC). The SAC will be governed by its own by-laws, if desired, and be assisted by Level B staff. SAC's primary role will be to provide a citizen's policy advisory group to the Level B Study Steering Committee, staff and DRBC on matters pertaining to the Level B study.

The SAC is designed to promote and insure a high degree of continuous public participation throughout the study. The Committee will be charged with the following functions:

(1) to provide substantive suggestions and comments on problems and issues that arise during the planning process, (2) to represent its constituencies effectively regarding problems, issues and planning alternatives, (3) to provide the catalyst for obtaining broad-based participation of various public interests.



### C. Overall Organization

The Study Organization Chart, Figure II-1, shows the roles to be played by the various groups described in Section A and B above. Work Groups under the direction of Level B Study Manager and the advice of the Study Steering Committee, will be set up as necessary to address major work elements.

General scopes of work to be performed by staff and participating agencies are described in Section V of this POS.

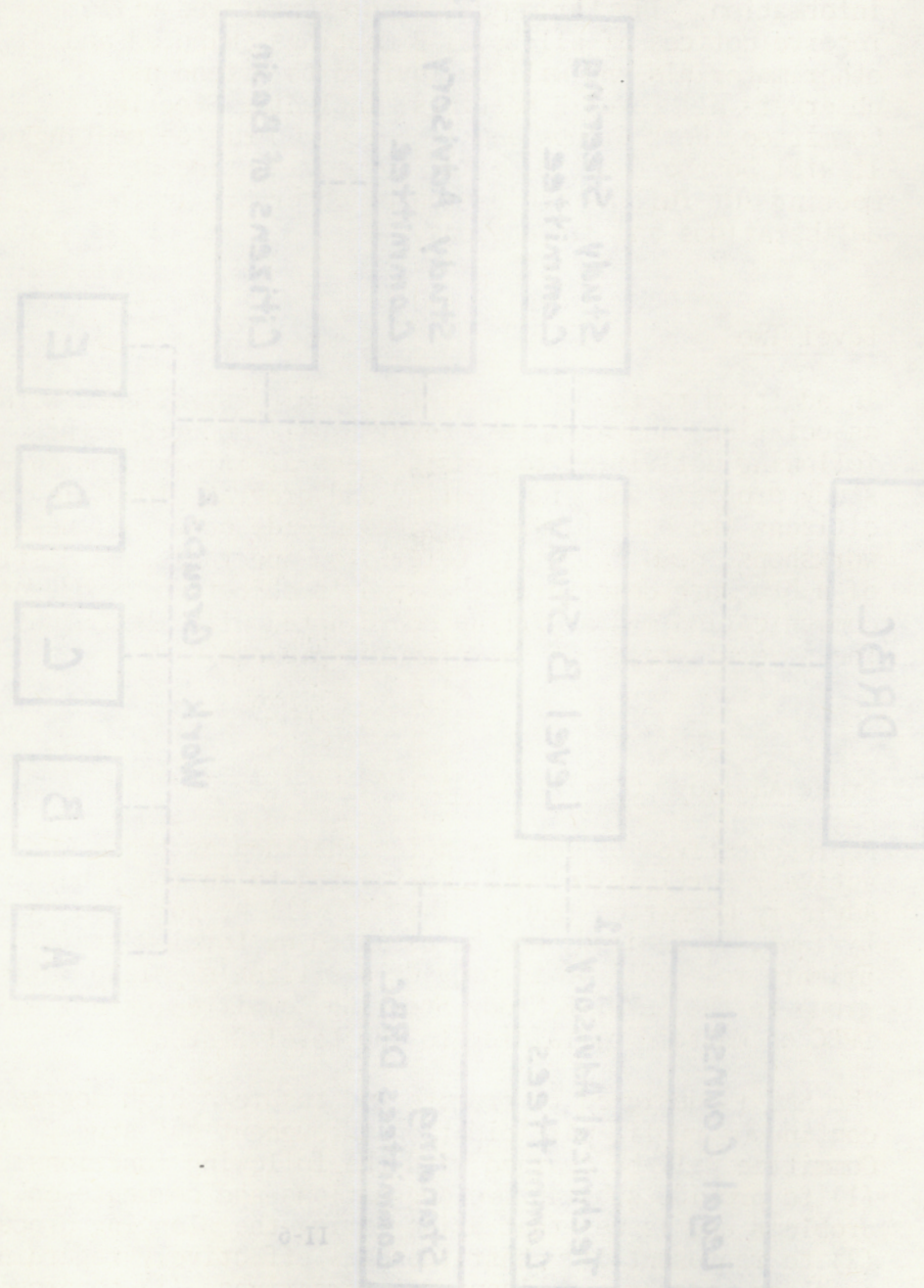
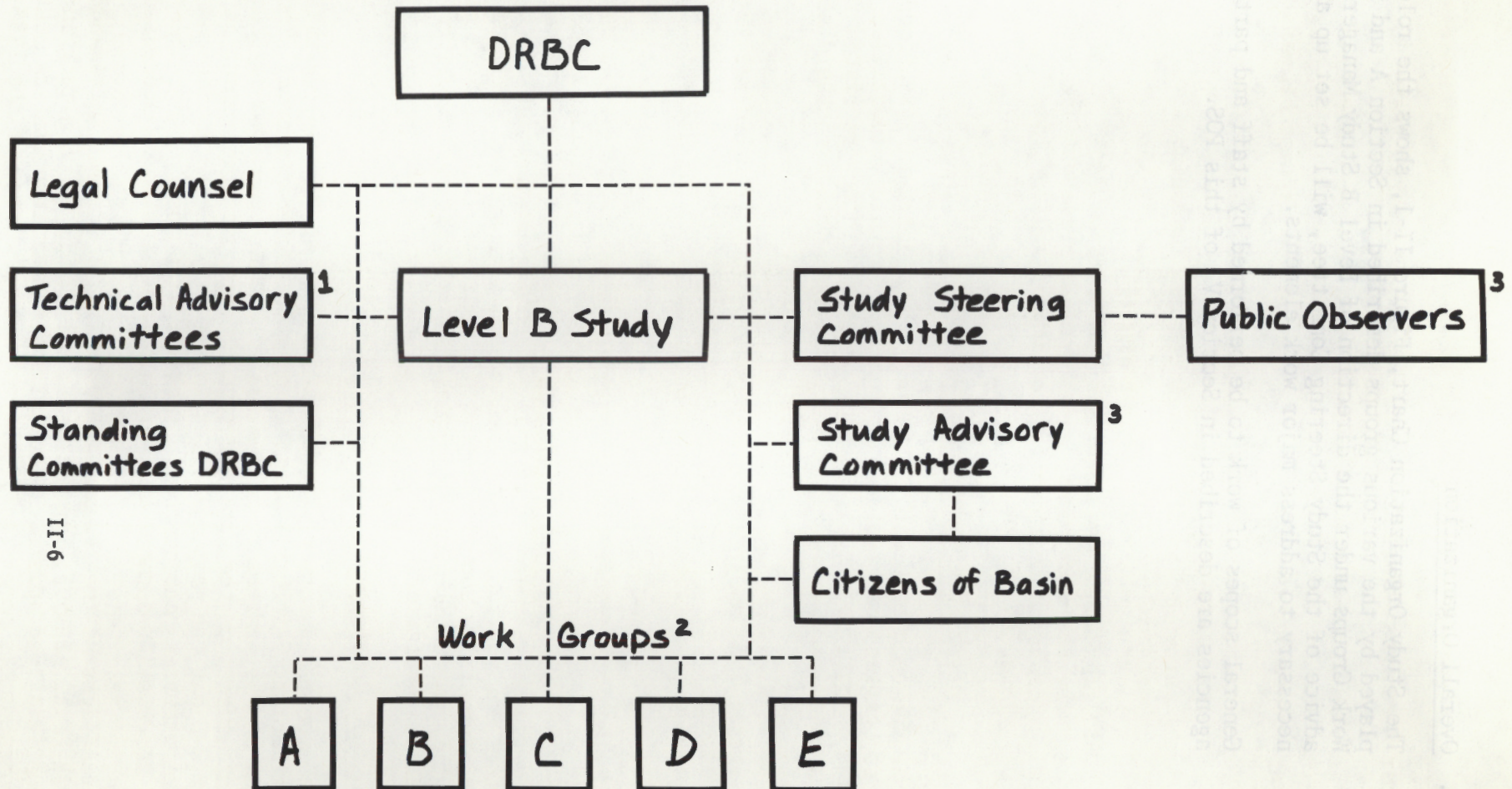




FIGURE II - 1  
Delaware River Basin Comprehensive Study  
Organization



1. Established on an ad hoc or as needed basis
2. Structure and membership presented in Section V
3. Presented in Section II



### III. Planning Approach

The Water Resources Council's Principles and Standards states that:

*"The overall purpose of water and land resource planning is to promote the quality of life, by reflecting society's preferences for attainment of the objective defined below:*

- A. *To enhance national economic development by increasing the value of the Nation's output of goods and services and improving national economic efficiency.*
- B. *To enhance the quality of the environment by the management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems." (WRC, Principles and Standards, p. 6)*

WRC's New Approach to Level B planning, promulgated in its Second Annual Report to Congress on Level B (Section 209) Planning, identifies specific goals and objectives of the planning process. These are listed in the Appendix to this POS, and are cited at several points in the discussion below.

These general and specific planning goals, drawn from Federal legislation and embodied in the Level B Memorandum of Agreement (MOA) between DRBC and WRC, are used to define the planning approach for the Delaware Basin Level B study.

Level B planning in this context must be directed towards two major objectives: (1) sound economic development of the Basin's water and land resources to encourage job stability, improved production and maintenance of the region's standard of living; (2) in the development of these resources, to protect our environment and insure that programs and policies proposed are environmentally sound. These two objectives will serve as integrating forces throughout the planning process as specific water related problems and needs are investigated.

#### ✓ A. Economic Development

The economic future of the Northeast and the Delaware Basin in particular, is clearly a matter of concern for the area. The choices made in the management of the Basin's water resources may have significant effects on the rate and type of economic development in the region. Level B has the responsibility to identify these choices and consider the potential consequences. Water-related policies for the promotion of the Basin's economy and agriculture must also be addressed.

The effects of the Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500), for instance, are likely to be direct and indirect, beneficial and adverse. Capital investment in pollution control equipment has been significant and must increase if the 1983 and 1985



goals of the Act are to be met. These costs for the older facilities typical of the Basin, may contribute significantly to plant shutdowns and resulting unemployment. On the other hand, improved water quality resulting from achieving the P.L. 92-500 goals may in the long run improve the economic climate. Availability of clean water for industrial use may offer cost advantages, and improved recreational opportunities and general environmental conditions which affect "quality of life" may offer a strong incentive to industry location in the area. Improved recreation potential also offers the opportunity for increased tourism, with related revenues.

Several completed and ongoing efforts have addressed the economic consequences of P.L. 92-500. The National Commission on Water Quality has assessed both the costs and the likelihood of achieving the 1983-1985 goals at the National level and sponsored a similar analysis by Betz Environmental Engineers for the Delaware Basin region (see bibliography). EPA staff for Regions II and III and State officials are concerned as well. Current evaluations do not always agree, however, and it is not clear whether some of the requirements of the Act may be modified. The Level B study must, therefore, direct further attention to the short and long term implications for the Basin's economy of the achievement of water quality goals.

Impacts of P.L. 92-500 on the agricultural sector of the Basin's economy must be addressed as well. Neither the potential strategies nor their costs for non-point source controls are adequately determined; estimates of runoff control costs have run very high. At the same time, the agricultural potential of the Basin is receiving increasing attention. Concern is expressed for preserving prime agricultural lands, for encouraging farming in a region which compared to much of the country offers a favorable combination of soils, climate, and water. National studies point out the potential cost savings implicit in growing crops where there is water;\* the current drought crises in the Southwest underline this viewpoint.

Water supply, and water allocation for both agriculture and the rest of the economy, are the other side of the coin. Encouraging agricultural growth, for example, may require a reevaluation of the priority of irrigation needs as DRBC develops its policy of water allocation. Policies which affect salinity levels, or salinity variations, in the Delaware Estuary, may have significant impacts on the Basin's industry. Uncertainty concerning these policies may be as significant as the policies themselves as an influence on plant location in the Basin. DRBC has several current and ongoing study programs addressing these issues. Level B must examine the potential implications of various salinity control alternatives.

#### B. Significant and Sensitive Environmental Resources

The Water Resources Council (see Appendix) charges Level B studies to plan: (1) "to protect, restore and/or improve the region's environmental quality;" and (2) "to identify the need for and foster the implementation of needed conservation programs." The Delaware Basin study is also charged by DRBC to prepare an Environmental Impact Statement (EIS) for the plans, programs, and policies recommended by the study.

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\* National Water Commission, Water Policies for the Future, final report, 1973.



For Level B to meet these mandates, two major approaches will be followed. First, the significant natural and altered environmental areas directly related to the Basin will be identified. This process will insure that Level B's recommendations in the planning process will be sensitive to protecting environmental quality, and at the same time, will provide the basis to determine beneficial and adverse impacts of alternative plans, programs, and policies. Second, present conservation programs, or planning programs such as water quality management planning, will be analyzed to assess their relationship to resource management and to insure that such programs are in harmony and consistent with comprehensive resource management in the Basin.

Table III-1 shows the relationship of significant and sensitive environmental resources to management alternatives. The listing of resource categories in the Table is inclusive, permitting participating Federal and State agencies to select the specific work elements to be accomplished in the study.

### C. Functional Areas Within the Level B Study

Fundamental in the Delaware Basin Level B study approach to water and related land resources management is the WRC objective (see Appendix), "to integrate functional or program planning where the programs impact on one another and the water and land resource base."

The following discussion describes problems, opportunities and needs, in the Delaware River Basin for each of the functional areas: water quality, water supply, stream flow, groundwater, flood loss, recreation, fish and wildlife, energy, and navigation.

These functional areas, and the study foci listed with each, were identified and refined during the first phase of the Level B study. They reflect input and comment from Level B Study Steering Committee, DRBC staff professionals, and several citizen groups.

In the discussion below, some of the functional areas are grouped together. This aggregation reflects both the important issues which the areas share, and the organization of the task forces or work groups which will perform the analysis necessary to address these issues.

Table III-2 at the end of this section, serves as an introduction to the specific work element descriptions in Section IV. The table notes the functional area under which each individual work element is described, and indicates to which other areas the work involved will also be directly relevant.

The table also lists a Work Element, Project Reevaluation, which is related to all functional areas though not one itself. The Delaware River Basin Level B study (see Section I) is charged to provide a basis on which to update DRBC's Comprehensive Plan for the Basin. Level B studies are also directed to work at a reconnaissance level in identifying alternative strategies to meet water resource needs. It is appropriate, therefore, to review and evaluate, at least at this reconnaissance level, major projects, plans and policies level proposed for the Basin by DRBC and other agencies. This work element will provide background for the Level B study's recommendations in each of the functional areas.



TABLE III-1

RELATIONSHIP OF SIGNIFICANT ENVIRONMENTAL RESOURCES TO  
RESOURCE MANAGEMENT ALTERNATIVES \*

Resource	Management Alternatives	
	Protect	Conserve
<b>A. Geology and Soils</b>		
1. Fossil Fuel Reserves.....		x
2. Mineral Resources.....		x
3. Aquifers.....		x
4. Coastal Beaches and Wetlands.....		x
5. Prime and Unique Agricultural Land.....		x
6. Flood Plains and Interior Wetlands.....		x
7. Unique Terrain Features.....		x
<b>B. Climatology</b>		
1. Air Quality.....	x	
2. Precipitation.....		x
<b>C. Water</b>		
1. Surface.....		x
2. Ground.....		x
<b>D. Biological</b>		
1. Natural Areas.....	x	
2. Forests.....		x
3. Endangered Species and Threatened Environments.....	x	
<b>E. Cultural Sites</b>		
1. Historical.....	x	
2. Archeological.....	x	

\* In accordance with Federal and State Environmental statutes, and alternative management strategies to be determined by study participants.



## 1. WATER QUALITY

### Related WRC Goals: (WRC Second Annual Report)

- to insure that areawide and local waste treatment management planning is in harmony with comprehensive resource management planning.*
- to promote analyses of alternative waste management systems and the application of emerging technology in cooperation with EPA, the State and others involved, based upon considerations of all sources of pollution, including point and non-point sources and agricultural return flows.*

### Problems, Opportunities, Needs

EPA's analysis of the relationship of Level B and water quality planning, concludes that the purpose of Level B planning conducted in fulfillment of the mandate of Sec. 209 must be to "provide a comprehensive, interagency and intergovernmental process for integrating the planning conducted pursuant to other sections of PL 92-500, notably Sec. 208, and the several other water and related land resource planning programs conducted by Federal agencies, regional entities, the states, and local entities, into a comprehensive management strategy" (EPA, Relationship of Level B and Water Quality Management Planning, p. 3-19).

The NAR Study in 1972 noted water quality as the chief water-related need for the Delaware Basin (U. S. Army Corps of Engineers, North Atlantic Regional Study, Annex 1 p. 239 ff). Point sources of pollution include domestic sewage with insufficient treatment, from fast growing suburban areas as well as older urban facilities, and a wide mix of industrial wastes. Past and present agricultural, construction and mining practices, and urban development contribute non-point source loads. The results have been many miles of degraded streams useless for fish and other aquatic life, as well as threats to the safety of drinking water supplies and the loss of recreation potential. In many areas groundwater contamination is a potentially serious problem as well.

DRBC has a long standing and well defined role in water quality control for the Basin, in stream criteria and standards, waste-load allocations and permit programs. The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500), and the Safe Drinking Water Act of 1974 (PL 93-523) have stimulated many studies and planning programs to address water quality problems. Facilities planning and state and areawide waste treatment planning (under Sections 201, 303(e), and 208 of PL 92-500) are well underway. It is likely that within the 15-25 year period which is the Level B study's primary concern, these planning programs will have resulted in a workable management, regulatory, and monitoring system for point sources.

The situation for non-point sources is not so clear. Section 208 planning in various areas has approached these problems in different ways.



Potential technical measures and institutional capabilities are not always well determined, and in many cases preliminary cost estimates are prohibitive. Municipal and industrial sludge and solid waste disposal are a critical problem in the urban areas of the basin.

Toxic substances are potential problems of unknown but growing magnitude. They threaten the safety of water supplies as well as aquatic life and the recreational use of the Basin's streams.

Salinity in the Delaware Estuary has played a dominant role in policy determinations since the beginning of DRBC. Yet many of the questions involved are still controversial. Salinity and water supply are dealt with under that functional area. The effects of various salinity levels, and changes in such levels, on the ecosystem of the estuary are significant as well, and need to be specified in a more definitive form than at present.

It may be appropriate to address other particular problem areas as well. An example is acid mine drainage in the Lehigh and Schuylkill Basins, at present and in the likelihood of a revitalized coal industry. Another is thermal pollution from power plant cooling.

#### Level B Foci

1. Potential effectiveness of water quality planning programs, consistency with DRBC Comprehensive Plan and other programs.
2. Long-term approaches to sludge and solid waste management.
3. Evaluation of means to deal with toxic and hazardous wastes.
4. Re-evaluation of salinity issues.
5. Management practices related to non-point source control.



## 2. WATER SUPPLY, GROUNDWATER, STREAMFLOW

Related WRC Goals: (WRC, Second Annual Report)

- to develop water supplies for diverse uses, including among many other uses, cooling water for power development.*
- to identify the need for and foster the implementation of needed conservation programs.*

### Problems, Opportunities, Needs

Water supply planning in the Delaware Basin in the past (by DRBC and others) has proceeded on the assumption that reservoir storage, including the Tocks Island project, could and would be provided to meet all likely needs of an expanding population and economy. (A ceiling on meeting power plant cooling needs was the only long-term constraint noted in DRBC's report, Water Management in the Delaware Basin.) Planning at the local level has traditionally operated on the premise that water will be provided to meet any development in any location.

Many aspects of these policies have had to be reexamined in recent years. First, concern for the environment and for rising costs have made structural approaches to water supply provisions less feasible. Even those projects which are eventually completed suffer significant delays. Second, continued high population and economic growth in the Basin are by no means sure. While an adequate and dependable water supply is clearly essential for the economic and social health of the region, the water uses projected by earlier studies on the basis of trends from the 1960's may be an unrealistic picture of future needs. Third, many local areas, concerned with mounting capital and other costs, are taking a more positive role in keeping development in step with available supplies.

The groundwater resources of the Delaware Basin represent a large present and potential water supply resource. At the same time, however, many local areas are experiencing rapid drops in water tables (Montgomery and Bucks Counties in Pennsylvania, for instance), and signs of depletion of the artesian aquifers such as the Raritan-Magothy formation have been noted for decades. Salt water intrusion and contamination from polluted surface waters, landfills, lagoons, and malfunctioning on-site septic systems represent threats to groundwater quality. Proposals for small or large artificial recharge or conjunctive ground-surface water use carry similar risks, whether small or large scale, from streams or treated wastewater.

Groundwater resources must thus be managed, as they are used, on many geographic scales. Groundwater law is not as clear as surface water law, and the potential role of management and regulatory agencies, including DRBC, is less well defined. Yet needs for groundwater policy are evident, to address local and large scale depletion, pollution threats, and the optimal use of groundwater for water supply. Studies from USGS Paper 381 to the present report that not enough is known about the aquifers of the Basin to serve as a



foundation for realistic groundwater management. This applies equally at the basin level (safe yields for artesian aquifers at their present levels, for instance) and for local areas (where precipitation, well yield, and stream-flow are immediately related). Available information in many cases is not an adequate basis for detailed studies of particular recharge projects or local allocation proposals.

A Level B water resources study cannot supply these information needs directly: the work is outside the two-year time frame, and certainly will involve going beyond "available data." Many study programs have set out to address these crucial groundwater issues: the Corps of Engineers' Southern New Jersey Water Resources Study, Pennsylvania, New Jersey, and Delaware planning, and various USGS studies, for instance. There is risk that duplication may occur among these studies; at the same time, each alone may be unable to deal with basin-wide policy issues, or with large scale innovative approaches to ground and surface water management. DRBC has proposed a basin-wide study which could provide the framework for more comprehensive groundwater planning and management. Level B's role here may be appropriately in "enabling" necessary work to coordinate existing efforts.

Water supply planning and allocation policies for the Delaware Basin must be reexamined in the context of all these factors. The Level B study for the Delaware more than in some other regions must reevaluate projections of population, economic, and agricultural growth in the Basin, to provide the most reasonable possible estimates of future water demand. Presently proposed projects must be reconsidered to determine their feasibility. Potential conservation techniques must be taken into account, and water supply solutions investigated which do not involve major impoundments. Integrated ground and surface water management must be explored. Clear criteria are needed to define water shortage and drought conditions, on a local as well as basin-wide level. Appropriate water allocation policies for these conditions should be laid out; clear policy would be useful, both for drought conditions and as a reference for future planning of industrial or other activities.

The relation of salinity, flow and water supply suitability in the Estuary should be reevaluated, since so many planning decisions depend on salinity policies. Minimum flow criteria have, of course, played a critical role in the management of the Delaware River mainstem since the formation of DRBC. The specified flows are considered essential as the basis for waste-load allocations for the Estuary, and as they determine salinity gradients, for the maintenance of a dependable water supply for the City of Philadelphia and oyster production in the lower Estuary.

State flow criteria exist too, used to prescribe impoundment releases and deal with proposed diversions, depletive uses, and waste discharges. These criteria take into account, to varying extents, desired instream water uses, fish and other ecological requirements, and the nature of the streams and of the areas through which they flow. Flow criteria on tributaries are thus not necessarily a consistent base for defining or identifying water shortage or drought conditions. Nor were the locations of gaging stations necessarily chosen with this purpose in mind. If an effective warning or allocation system is to be developed for water shortages and droughts, the adequacy of these criteria and gaging networks must be determined.



"Low flow" streams, appropriately defined, may be areas deserving of special management or protection as part of an overall watershed management program. Seriously reduced streamflows in some tributaries have been noted as a result of drawing water supplies from wells or local streams and discharging the resulting sewage outside the sub-basin. This problem underscores the need, in many areas, to consider (for management purposes as well as in fact) surface and groundwater as part of the same hydrologic system. The general adequacy of the seven-day, ten-year low flow (Q7-10) as an objective for all streams has been challenged as well. For example, on some streams even of high average flow, Q7-10 flows may not provide protection for aquatic life.

The maintenance of stream flow for waste assimilation has come under question as a water quality management policy. Wasteload allocations are based, of course, on some assumption about the volume of the receiving waters, but EPA policy is that flow augmentation is not to be a substitute for adequate waste treatment. Low-flow policies, including the question of flow-maintenance storage in proposed impoundments, must be reevaluated in the context of state and area water quality management planning and the achievement of 1983 and 1985 goals.

#### Level B Foci

1. Reevaluation of likely future water needs in the Delaware Basin in the context of likely development patterns.
2. Review of flow, salinity, and water supply relationships on the Delaware mainstem.
3. Clarification of water shortage and drought conditions and "design drought" definition; flow-frequency analyses to address this issue.
4. Framework in which to address basin-wide groundwater issues, such as contamination, requiring comprehensive approach.
5. Approaches to water supply management including non-structural and conservation measures, conjunctive use of ground and surface water resources, regionalized water delivery systems.



### 3. FLOOD LOSS REDUCTION

#### Problems, Opportunities, Needs

In the flood of August 1955, damages in the Delaware Basin were in excess of \$100 million, and 99 persons lost their lives. With minor exceptions for some of the tributary areas, this flood was the most severe recorded in terms of property damage.

Tributary reservoirs which have been constructed since the 1955 storm have been significant in flood loss protection within the reaches located downstream from the impoundments. Their effect on flood stage reduction for the mainstem Delaware has been only minimal, however. The Delaware River Basin Commission has proposed that the Corps of Engineers develop means for flood loss prevention, in the mainstem area that would have had protection through the proposed Tocks Island project. This study has not yet been funded.

An active flood loss reduction program is currently underway in the basin, and will cover the entire basin eventually. The Delaware River Basin Commission and other agencies and consultants are developing flood plain delineation and usage studies for the basin municipalities. Most of this activity is funded by HUD through the Federal Flood Insurance Administration.

The effects of urbanization on the alteration of flood plains is being evaluated by the U. S. Army Corps of Engineers for the Rancocas, Mantua and Cooper Basins, in the Southern New Jersey Water Resources Study. (U. S. Army COE, Plan of Study, 1975).

The Delaware River Basin Commission Flood Plain Regulations, adopted November 10, 1976 (DRBC, 1976) prohibit erection of habitable structures and placing of fill in the floodways. Within the flood fringe, structures may be constructed subject to protective measures to prevent flood damage.

For an overall flood loss reduction program a mix of methods is needed. For example, state, county, and municipal efforts to obtain flood plain conservation easements have had some success. Green Acres programs have also been a means to acquire flood prone areas.

#### Level B Foci

1. Evaluation of adequacy of existing and proposed federal, interstate, state and municipal flood prevention and flood loss reduction regulations and programs.
2. Determination of need for basinwide flood loss reduction plan.
3. Impact of urbanization on runoff and flood patterns; storm-water management for flood loss reduction.



#### 4. RECREATION, FISH AND WILDLIFE

Related WRC Goals: (WRC, Second Annual Report)

*--to provide increased recreational and other leisure time opportunities requiring water and related land resources.*

*--to identify potential wilderness areas, wild and scenic rivers, parks, open space, green space, and other natural amenities.*

#### Problems, Issues, Opportunities

The Delaware Basin offers a wide range of potential recreational activities, both water-related and not. To ensure that adequate opportunities are actually made available to the people of the region, many issues must be addressed: e.g., ownership and development responsibility, utilization of utility and stream valley corridors, assessment of recreation planning priorities, funding sources and their availability for program implementation.

In the densely populated areas around urban centers, improved opportunities are needed for activities near to home. This need may be accentuated as rising costs of gasoline render distant recreation areas less accessible and increasing pollution of waters near ocean beaches threaten these areas as a recreational resource. More emphasis must thus be placed on facilities near population centers. In particular, improved water quality in urban stretches, required by P.L. 92-500, would make possible waterfront parks which would satisfy many needs of low and middle income citizens. Consideration must be given as well to wilderness and rural opportunities. There are under-utilized state parks and forest areas which during weekdays and off season could satisfy a portion of recreation demand without additional capital expenditures. Improved access would also significantly increase recreational use opportunities in many areas.

Wild and Scenic river designations are awaiting federal program inclusion for the Upper Delaware segment. Coordination is essential among federal and state programs for wild, scenic and recreational rivers and to ensure the preservation of cultural, historic, and natural resources. There are risks of development on roughly 10,000 acres within the Delaware Water Gap National Recreation Area (DWGNRA) that have not been acquired by the Corps of Engineers due to lack of acquisition program funds.

Potential facilities for boating, hiking, bicycling and other types of recreational activity have not been thoroughly explored in the region nor has the use of reservoirs for recreational activities. Planning for these should be integrated into overall recreational planning.

Achievement of water quality standards will also have significant effects on the fish and wildlife resources of the Basin. Degraded water quality including benthic deposits of accumulated wastes, has adversely affected the fishery of the Estuary. Significant decline of shellfish grounds in the bay



and tributaries has contributed to the reduction of these populations. Reduction of important nursery grounds and spawning habitats, coupled with physical or chemical barriers to migration, has contributed to the decline of the sport and commercial fishery. Heated releases from power plants, and inadequate design of intake systems and screens have led to fish kills. Following the implementation of programs in pollution abatement, sport and commercial fishery resources are expected to show significant improvements. Re-establishment of migratory runs of anadromous fish to spawning grounds and the improvement of aquatic environments in the upper reaches of the Basin have great potential for the Basin's sport and commercial fishery resources.

By maintaining and augmenting existing hatchery and stocking programs, improving habitat, and the construction of water access facilities, the Basin's fisheries can be enhanced. Through the preservation of oyster beds, the shellfish resources of the Delaware Estuary have potentially increased economic importance.

Conservation of fresh water wetlands and marshes can provide essential habitats for flora and fauna and nurseries for the fishery. The upper reaches of the Delaware provide recreational opportunities in a natural setting. These resources can be preserved by programs for the acquisition and management of lands for multiple uses. Wetlands in proximity to metropolitan centers, such as Tinicum Marsh, provide increased habitats to protect wildlife for recreational activities. The creation of additional areas also will provide further interrelated habitats, along the Atlantic seaboard.

Successful management and conservation of fish and wildlife and the maintenance and improvement of recreational opportunities will clearly be of benefit to the people of the Basin. To do so, however, requires addressing conflicts among potential uses of water and related land resources.

#### Level B Foci

1. Overview of basin-wide recreation opportunities, problem areas, alternative solutions and additional needs.
2. Consideration of transportation and access requirements, opportunities for enhancement, and institutional needs.
3. Threatened habitats, species, enhancement opportunities and related economic considerations.
4. Habitat requirements and improvement opportunities and techniques with estimated costs of alternatives.



## 5. ENERGY, NAVIGATION

Related WRC Goal: (WRC, Second Annual Report)

*--to provide for improvements in navigation and coastal and shoreline management.*

### Problems, Opportunities, Needs

The Delaware River Basin is the site of numerous fossil fuel steam electric generation plants, and soon will have several operating nuclear electric utilities. The Pennsylvania upland portion has considerable untapped deposits of anthracite coal. To the east of the Delaware River Basin on the outer continental shelf, deposits of oil and natural gas are likely to be developed. Development of either or both of these deposits could provide a healthy impetus to regional and national economic development. Development of both resources could cause considerable environmental degradation if not properly managed.

The Delaware River Basin Electric Utilities Group (DRBEUG) periodically submits to the Delaware River Basin Commission, updated master siting studies for generating and transmission facilities. Consumptive use of water and thermal and air pollution are major issues. An environmental overview of these studies is being prepared by DRBC. A site study for a water supply reservoir for makeup water to supply consumptive water requirements of steam electric power stations during low flow has been submitted to the Commission.

Many of the abandoned deep and strip coal mines have been sources of stream pollution from coal siltation and acid drainage. The State of Pennsylvania has developed programs to control these problems for existing and new mines.

Hydropower provides a small fraction of the total electricity generated in the basin. The potential for increased development will be addressed.

Commercial shipping in the Delaware River Basin is limited to the tidal Delaware River. Ameriport, the ports from Wilmington to Trenton, is a prime impetus to the economy of the Delaware River Basin. Maintenance and improvement of navigation facilities is important to the Basin's economy.

An environmental problem arising from commercial shipping is spillage of oil and other toxic materials, and potential hazardous conditions from accidents of ships conveying explosive or otherwise dangerous cargo. The Coast Guard has ongoing programs to mitigate spills and accidents arising from shipping.

To maintain shipping routes, considerable dredging of the ship channel, anchorages and docking areas is required. The dredging operations can cause local deterioration of water quality. The deposits that are periodically dredged arise from erosion and waste discharge. The disposal of these dredged spoils can cause environmental damage to shorelines, particularly



biologically significant wetlands. The Corps of Engineers has ongoing programs to limit adverse effects of dredging and resultant spoil disposal.

Proposals for a deepwater port in the lower Delaware Bay have been submitted by the Delaware Bay Transport Company, and others. Proponents claim that this facility will reduce the potential for spillage and accidents.

#### Level B Foci

1. Water requirements and other environmental effects of energy production and transport of the raw materials for energy production.
2. Hydropower potential.
3. Economic and environmental aspects of maintenance and development of shipping in the tidal Delaware River and Bay.
4. Siting regulations for hazardous or toxic materials.



TABLE III-2

WORK ELEMENT INTERFACES AMONG FUNCTIONAL AREAS

The work elements listed here correspond to those described in Section IV below.

WORK ELEMENTS	(AREA)	ECONOMIC DEVELOPMENT	ENVIRONMENTAL RESOURCES	WATER QUALITY	WATER SUPPLY	STREAM FLOW	GROUNDEATER	FLOOD LOSS REDUCTION	RECREATION	FISH & WILDLIFE	ENERGY	NAVIGATION	PROJECT EVALUATION
1. <u>Economic Development</u>													
A. Projections	X	"	"	"	"	"	"	"	"	"	"	"	"
B. Impacts of P.L. 92-500	X	"	"	"	"	"	"	"	"	"	"	"	"
C. Salinity Control Impacts	X	"	"	"	"	"	"	"	"	"	"	"	"
D. Economic Strategies	X	"	"	"	"	"	"	"	"	"	"	"	"
2. <u>Significant Environmental Resources</u>													
A. Significant Areas		X	"	"	"	"	"	"	"	"	"	"	"
B. Priority Areas		X	"	"	"	"	"	"	"	"	"	"	"
C. Public Land Ownership		X	"	"	"	"	"	"	"	"	"	"	"
D. Urban Development	"	X	"	"	"	"	"	"	"	"	"	"	"
E. Legislation Review	"	X	"	"	"	"	"	"	"	"	"	"	"
F. Impact Analysis		X	"	"	"	"	"	"	"	"	"	"	"
3. <u>Water Quality</u>													
A. Stream Classification	"	"	X	"	"	"	"	"	"	"	"	"	"
B. Present Quality	"	"	X	"	"	"	"	"	"	"	"	"	"
C. Projected Waste Generation.	"	"	X	"	"	"	"	"	"	"	"	"	"
D. Future Quality	"	"	X	"	"	"	"	"	"	"	"	"	"
E. Planning Review	"	"	X	"	"	"	"	"	"	"	"	"	"

WORK ELEMENTS	(AREA)	ECONOMIC DEVELOPMENT	ENVIRONMENTAL RESOURCES	WATER QUALITY	WATER SUPPLY	STREAM FLOW	GROUNDEATER	FLOOD LOSS REDUCTION	RECREATION	FISH & WILDLIFE	ENERGY	NAVIGATION	PROJECT EVALUATION
Water Quality (continued)													
F. Residual Wastes	"	"	X	"	"	"	"	"	"	"	"	"	"
G. Toxic/Hazardous Wastes	"	"	X	"	"	"	"	"	"	"	"	"	"
H. Erosion	"	"	X	"	"	"	"	"	"	"	"	"	"
I. Ocean Pollution	"	"	X	"	"	"	"	"	"	"	"	"	"
J. W. Branch--Dela-													
4. <u>Water Supply</u> ware	"	X	"	"	"	"	"	"	"	"	"	"	"
A. Projected Depletive Uses	"	"	X	"	"	"	"	"	"	"	"	"	"
B. Ground/Surface Supplies	"	"	X	"	"	"	"	"	"	"	"	"	"
C. Water-short Areas	"	"	X	"	"	"	"	"	"	"	"	"	"
D. N.J. Diversions	"	"	X	"	"	"	"	"	"	"	"	"	"
E. High-flow Skimming.	"	"	X	"	"	"	"	"	"	"	"	"	"
F. Conservation	"	"	X	"	"	"	"	"	"	"	"	"	"
G. Water Supply Plans	"	"	X	"	"	"	"	"	"	"	"	"	"
H. Drought Allocations	"	"	X	"	"	"	"	"	"	"	"	"	"
I. Drought Warning	"	"	X	"	"	"	"	"	"	"	"	"	"
J. Isochlor Maintenance	"	"	X	"	"	"	"	"	"	"	"	"	"
K. Desalinization	"	"	X	"	"	"	"	"	"	"	"	"	"
5. <u>Stream Flow</u>													
A. Water Budget	"	"	X	"	"	"	"	"	"	"	"	"	"
B. Flow Criteria	"	"	X	"	"	"	"	"	"	"	"	"	"

X--The functional area under which the element is described.

"--Other functional areas to which the element is directly relevant.



TABLE III-2

WORK ELEMENT INTERFACES AMONG FUNCTION AREAS (continued)

WORK ELEMENTS	(AREA)	ECONOMIC DEVELOPMENT	ENVIRONMENTAL RESOURCES	WATER QUALITY	WATER SUPPLY	STREAM FLOW	GROUNDWATER	FLOOD LOSS REDUCTION	RECREATION	FISH & WILDLIFE	ENERGY	NAVIGATION	PROJECT EVALUATION
<u>Stream Flow (continued)</u>													
C. Flow Effects of Depletive Uses						X							
D. Mainstem Flow.						X							
E. Watershed Problems						X							
<u>6. Groundwater</u>													
A. Basin-wide Hydrology							X						
B. Laws/Policies							X						
C. Data Needs							X						
D. Coordinate Studies							X						
E. Conjunctive Use							X						
<u>7. Flood Loss Reduction</u>													
A. Adequacy of Existing Programs								X					
B. Future Measures								X					
C. Protection of Mainstem Structures								X					
D. Urban Stormwater Management								X					
<u>8. Recreation</u>													
A. Existing Areas									X				
B. Problems/Solutions									X				

WORK ELEMENTS	(AREA)	ECONOMIC DEVELOPMENT	ENVIRONMENTAL RESOURCES	WATER QUALITY	WATER SUPPLY	STREAM FLOW	GROUNDWATER	FLOOD LOSS REDUCTION	RECREATION	FISH & WILDLIFE	ENERGY	NAVIGATION	PROJECT EVALUATION
<u>9. Fish and Wildlife</u>													
A. General Requirements										X			
B. Specific Problems/Solutions.										X			
<u>10. Energy</u>													
A. Basin Adequacy for Energy Development											X		
B. Master Siting Studies											X		
C. Energy Export											X		
D. Hydropower Potential											X		
<u>11. Navigation</u>													
A. Siting Criteria/Hazardous Materials												X	
B. Deepwater Port												X	
C. OCS Effects												X	
D. Sedimentation Trends												X	
E. Proposed Projects												X	
F. Dredged Spoil Disposal												X	
<u>12. Project Evaluation</u>													
A. COE Projects													X
B. Other Projects													X

X--The functional area under which the element is described.  
 s--Other functional areas to which the element is directly relevant.



#### IV. Plan of Work

This section describes the work elements to be carried out in the course of the Level B study process. The letters identifying each correspond to those in Table III-1 in Section III above. They also appear in the budget allocations presented in Table IV-1 at the end of this section.

Table IV-1 indicates the Level B budget allocation allocation for each work element, and the distribution among Level B staff, the states, and the several Federal agencies.

##### ✓ 1. Economic Development

- A. Compare and evaluate OBERS-E, state and other projections for population, economic, agriculture and power by sub-basin to Year 2000. Establish reasonable projections or high-low-medium ranges for use through the planning process.
- B. Analyze potential socio-economic impacts of achieving P.L. 92-500 water quality goals. Evaluate existing studies and analyses. Identify potential or likely resolution of pollution control costs with economic and social health.
- C. Analyze potential economic impacts of various salinity control alternatives for the Delaware Estuary. Concentrate on long-term effects.
- D. Identify consistent water quality, water allocation and other strategies appropriate for encouraging industry and agriculture in the Delaware Basin.

##### 2. Significant Environmental Resources

- A. Identify and describe significant and sensitive environmental areas, using USGS Land Use and Land Cover Classification Systems (LUDA) mapping and other Federal, state, regional, local sources. Areas to be selectively investigated in this work include terrain analysis, geology, soils, climatology, water, biological, and cultural characteristics.
- B. Establish priorities for areas to be protected, conserved, restored and developed, working in cooperation with appropriate Federal and State agencies.
- C. Map and describe public land ownership (cooperative gamelands, state forest lands, state parks, wildlife refuge, etc.).
- D. Discuss urban development related to water and land resource management with consideration given to land application of wastewater and wastewater by-products.
- E. Review of Federal and State Environmental Legislation to assess present management capabilities for protection and conservation of identified significant and sensitive environmental areas.
- F. Analyze environmental impact of Level B alternative plans throughout planning process and the development of the EIS for the final Level B plan.



### 3. Water Quality

- A. Map and tabulate stream classification, standards, and the location of sampling stations on the Delaware mainstem and tributaries.
- B. Summarize present water quality and recent trends in basin streams. Note significant groundwater problem areas.
- C. Estimate waste generation for projected population, economic and agricultural activities.
- D. Estimate likely future surface and groundwater quality in major sub-basins, and identify areas where streams may not meet standards.
- E. Evaluate the status of 201, 208, 303(e), and other water quality planning in the Basin. Evaluate likely accomplishments, determine consistency with other elements of DRBC's Comprehensive Plan.
- F. Recommend potential long-term sludge management practices based on on-going DRBC studies.
- G. Summarize potential means to manage toxic and hazardous substances and industrial "exotic wastes." Consider implications of the requirements of the Safe Drinking Water Act.
- H. Determine erosion amounts and historical trends.
- I. Review available reports on ocean pollution problems off the New Jersey coast, evaluate consequences for the Delaware Basin.
- J. Evaluate non-point source pollution and eutrophication of the West Branch Delaware River Watershed above and including Cannonsville Reservoir. Identify land and farm management practices to reduce non-point pollution.

### 4. Water Supply

- A. Prepare estimates of depletive water uses, based on projections developed under Economic Development.
- B. Summarize present and potential ground and surface water supplies, identify data gaps.
- C. Identify present and potential water-short areas.
- D. Determine DRBC and New Jersey policy, legal status, and likelihood of increased diversions to New Jersey.
- E. Explore feasibility (technical, legal, institutional, environmental) of high-flow skimming of the Delaware River mainstem, for water supply, aquifer storage and other uses. Determine need for Level C study if appropriate.
- F. Explore short and long term feasibility (effectiveness, costs, enforceability) of conservation strategies for various categories of water use. Note policy issues raised.



- G. Compare and evaluate present water supply plans. Comment on consistency with identified water demands, and with other planning efforts. Note identified needs for further regionalization of systems (DRBC Resolution).
- H. Consider implications of DRBC's proposed water allocation policies for water shortages or droughts.
- I. Evaluate need for an "early warning system" for water shortages or droughts at the sub-basin level (roughly as outlined by Pennsylvania in its testimony on modified reservoir releases).
- J. Reexamine needs and costs for maintaining the 250 mg/l isochlor at the mouth of the Schuylkill in context in other plan elements.
- K. Investigate feasibility of desalinization and other innovative approaches.

#### 5. Stream Flow

- A. Summarize water budget of the Delaware Basin: precipitation and runoff, statistical evaluation of stream flows. Note variations by major sub-basin.
- B. Identify stream flow criteria for instream uses. Summarize DRBC and State flow criteria or goals for reservoir release schedules, wild and scenic rivers, drought flow definitions, or other purposes as appropriate.
- C. Estimate effects on stream flows of projected depletive water uses.
- D. Examine and summarize relationships between mainstem flows, reservoir release schedules, and salinity, considering defined drought conditions and projected depletive uses.
- E. Identify watersheds with present or potential stream flow and water table problems, in particular due to water supply/effluent disposal methods. Propose means to alleviate problem if possible.

#### 6. Groundwater

- A. Summarize basin-wide groundwater hydrology. Include estimated safe yields and aquifer recharge areas where known.
- B. Summarize existing groundwater laws and policies, DRBC and State. Investigate legal and institutional issues for basin-wide groundwater policies.
- C. Identify critical basin-wide data needs; coordinate with proposed DRBC groundwater study.



- D. Investigate means to facilitate coordination of groundwater studies in the Delaware Basin area.
- E. Investigate conjunctive use as a means of managing surface and ground water resources.

7. Flood Loss Reduction

- A. Evaluate adequacy of existing flood loss reduction programs in the Delaware Basin; consider need for basin-wide flood loss reduction plan.
- B. Investigate flood plain conservation easements, land acquisition, and similar measures to reduce potential for future flood damage.
- C. Address feasibility of protective measures for existing structures in the flood plain along the Delaware River mainstem.
- D. Evaluate potential of stormwater runoff management to minimize flooding in urbanizing areas.

8. Recreation

- A. Evaluate existing and potential recreation areas together with an assessment of adequacy to meet needs and where appropriate, need for protection--an overview of basin-wide needs.
- B. Delineate major recreation and cultural problem areas through consideration of distance, access, and transportation constraints; increased opportunities through enhancement of facilities; utilization of water supply reservoirs; integration of SCORP Planning efforts; evaluation of DWGNRA status; and develop alternative plans to meet needs and outline deficiencies for further study.

9. Fish and Wildlife

- A.\* Survey and describe distribution and abundance of major fish and wildlife species, including location, habitat requirements, enhancement potential, deficiencies in productivity potential consequences of habitat alternation, and threatened species.
- B.\* Assess specific water quality problems, including toxic and hazardous substances, dredging stream flow problems and remedial measures for improvement of water quality.
- \* Both A and B will include emphasis upon those factors that affect completion of the life cycle.

10. Energy

- A. Assess adequacy of pollution control and water supply management capabilities in the Delaware Basin to accommodate energy development.
- B. Evaluate Master Siting Studies prepared by electric utilities.



C. Investigate probability of the Delaware Basin becoming a major energy exporter, due to Outer Continental Shelf or coal development. Assess environmental aspects of this development.

D. Evaluate hydropower potential in the Delaware Basin.

#### 11. Navigation

A. Review and evaluate siting criteria for transport and handling of hazardous or toxic materials, particularly as they affect water resources.

B. Review environmental aspects of the proposed deepwater port in Delaware Bay.

C. Assess environmental effects of shipping or alternative conveyance for oil transport particularly from OCS through Delaware River Basin.

D. Show trends of sedimentation in the tidal Delaware River.

E. Delineate proposed or possible navigation projects.

F. Address need for a comprehensive dredged spoil disposal plan.

#### 12. Evaluation of Major Proposed Projects

A. At a reconnaissance level, reevaluate costs, benefits, and environmental aspects of proposed U. S. Army Corps of Engineers projects: Maiden Creek, Aquashicola, Prompton, (modification), and Walter (modification).

B. Carry out a corresponding analysis for proposed major non-Corps of Engineers projects.

\*\*\*\*\*

The following Table IV-1 shows the budget allocation for Level B staff, States (collectively) and the several Federal agencies for each work element. Information for the Table was drawn from Section VI "Budget" which also contains greater detail on tasks to be performed by the Federal agencies and their bureaus.

More detailed definition of Federal and State agency tasks will be developed through Work Group assignments, described in Section V, and the submission by the States of their recommended total in-kind and contract services allocations of Level B funds to work elements. This allocation is required sixty days after approval of the Plan of Study (POS).

It should be noted in regard to State allocations, only State in-kind services (\$170,000) are shown in Table IV-1.

Work Group assignments will also include activities associated with the phases of Level B plan development described in Section V. Funding for these activities is included in the budgeted amounts shown here.



TABLE IV-1

BUDGET ALLOCATION FOR THE LEVEL B STUDY BY WORK ELEMENT FOR EACH FUNCTIONAL AREA

TOTAL DURATION OF STUDY  
(IN THOUSANDS OF DOLLARS)

Element	Description	Level B Staff	STATES	USDA	COE	DOI	FPC	DOC	DOT	Total
<u>1. ECONOMIC DEVELOPMENT</u>										
A•	Projections	10		11(ERS)						21
B•	Impacts of P.L. 92-500	4								4
C•	Salinity Control Impacts	4								4
D•	Economic Strategies	20		15(SCS)						35
	State Assistance in Completing above Elements		14							14
TOTALS		38	14	26						78
<u>2. SIGNIFICANT ENVIRONMENTAL RESOURCES</u>										
A•	Significant Areas	9		16(SCS, FS)		8(GS)				33
B•	Priority Areas	15	4							19
C•	Public Land Ownership	5								5
D•	Urban Development	5		10(SCS)						15



TABLE IV-1

BUDGET ALLOCATION FOR THE LEVEL B STUDY BY WORK ELEMENT FOR EACH FUNCTIONAL AREA

TOTAL DURATION OF STUDY  
(IN THOUSANDS OF DOLLARS)

Element	Description	Level B Staff	STATES	USDA	COE	DOI	FPC	DOC	DOT	Total
<u>2. SIGNIFICANT ENVIRONMENTAL RESOURCES (continued)</u>										
E•	Legislation Review	5	4							9
F•	Impact Analysis	45	10	5(SCS)						60
TOTALS		84	18	31		8				141
<u>3. WATER QUALITY</u>										
A•	Stream Classification	4								4
B•	Present Quality	4								4
C•	Projected Waste Generation	14		5(SCS)						19
D•	Future Quality	2								2
E•	Planning Review	20	7							27
F•	Residual Wastes	2								2
G•	Toxic/Hazardous Wastes	12								12
H•	Erosion	2		10(SCS)						12
I•	Ocean Pollution	5								5



TABLE IV-1

BUDGET ALLOCATION FOR THE LEVEL B STUDY BY WORK ELEMENT FOR EACH FUNCTIONAL AREA

TOTAL DURATION OF STUDY  
(IN THOUSANDS OF DOLLARS)

Element	Description	Level B Staff	STATES	USDA	COE	DOI	FPC	DOC	DOT	Total
<u>3. WATER QUALITY (continued)</u>										
J•	West Branch Delaware River Study	5		30(SCS, FS, ERS)						35
	TOTALS	70	7	45						122
<u>4. WATER SUPPLY</u>										
A•	Projected Depletive Uses	4		25(ERS)			3			32
B•	Ground/Surface Supplies	2	6							8
C•	Water-short Areas	5	6							11
D•	New Jersey Diversions	10	2							12
E•	High-flow Skimming	4			3					7
F•	Conservation	10								10
G•	Water Supply Plans	10	5							15
H•	Drought Allocations	10								10
I•	Drought Warning	5								5



TABLE IV-1

BUDGET ALLOCATION FOR THE LEVEL B STUDY BY WORK ELEMENT FOR EACH FUNCTIONAL AREA

TOTAL DURATION OF STUDY  
 (IN THOUSANDS OF DOLLARS)

Element	Description	Level B Staff	STATES	USDA	COE	DOI	FPC	DOC	DOT	Total
<u>4. WATER SUPPLY (continued)</u>										
J•	Isochlor Maintenance	10								10
K•	Desalinization	5								5
	TOTALS	75	19	25	3		3			125
<u>5. STREAM FLOW</u>										
A•	Water Budget	20				8 (GS)				28
B•	Flow Criteria	2								2
C•	Flow Effects of Deplet- ive Uses	10	9			2 (GS)				21
D•	Mainstem Flow	10								10
E•	Watershed Problems	2	8							10
	TOTALS	44	17			10				71
<u>6. GROUNDWATER</u>										
A•	Basin-wide Hydrology	4								4



TABLE IV-1

BUDGET ALLOCATION FOR THE LEVEL B STUDY BY WORK ELEMENT FOR EACH FUNCTIONAL AREA

TOTAL DURATION OF STUDY  
(IN THOUSANDS OF DOLLARS)

Element	Description	Level B Staff	STATES	USDA	COE	DOI	FPC	DOC	DOT	Total
<u>6. GROUNDWATER (continued)</u>										
B•	Laws/Policies	2	2							4
C•	Data Needs	4	2							6
D•	Coordinate Studies	2	4							6
E•	Conjunctive Use	37	6		35	40(GS)				118
TOTALS		49	14		35	40				138
<u>7. FLOOD LOSS REDUCTION</u>										
A•	Adequacy of Existing Programs	18	7	2(SCS)	5					32
B•	Future Measures	9			4					13
C•	Protection of Main-stem Structures	3								3
D•	Urban Stormwater Management	18								18
TOTALS		48	7	2	9					66



TABLE IV-1

BUDGET ALLOCATION FOR THE LEVEL B STUDY BY WORK ELEMENT FOR EACH FUNCTIONAL AREA

TOTAL DURATION OF STUDY  
(IN THOUSANDS OF DOLLARS)

Element	Description	Level B Staff	STATES	USDA	COE	DOI	FPC	DOC	DOT	Total
<u>8. RECREATION</u>										
A•	Existing Areas	10				15 (BOR)				25
B•	Problems/Solutions	12	7			10 (BOR, NPS)				29
TOTALS		22	7			25				54
<u>9. FISH AND WILDLIFE</u>										
A•	General Requirements	4	8			9 (FW)				21
B•	Specific Problems/Solutions	10	8			9 (FW)				27
TOTALS		14	16			18				48
<u>10. ENERGY</u>										
A•	Basin Adequacy for Energy Development	4	4				2			10
B•	Master Siting Studies	4					4			8
C•	Energy Export	6	7				2	5	5	25



TABLE IV-1

BUDGET ALLOCATION FOR THE LEVEL B STUDY BY WORK ELEMENT FOR EACH FUNCTIONAL AREA

TOTAL DURATION OF STUDY  
(IN THOUSANDS OF DOLLARS)

Element	Description	Level B Staff	STATES	USDA	COE	DOI	FPC	DOC	DOT	Total
<u>10. ENERGY (continued)</u>										
D•	Hydropower Potential	4					5			9
	TOTALS	18	11				13	5	5	52
<u>11. NAVIGATION</u>										
A•	Siting Criteria/Hazardous Materials	5								5
B•	Deepwater Port	5	8		3					16
C•	OCS Effects	3								3
D•	Sedimentation Trends	8			5					13
E•	Proposed Projects	2			2					4
F•	Dredged Spoil Disposal	2								2
	TOTALS	25	8		10					43



TABLE IV-1

BUDGET ALLOCATION FOR THE LEVEL B STUDY BY WORK ELEMENT FOR EACH FUNCTIONAL AREA

TOTAL DURATION OF STUDY  
(IN THOUSANDS OF DOLLARS)

Element	Description	Level B Staff	STATES	USDA	COE	DOI	FPC	DOC	DOT	Total
<u>12. PROJECT EVALUATION</u>										
A•	COE Projects	35			45					80
B•	Other Projects	30	16		10					56
TOTALS		65	16		55					136



## V. Plan Development, Work Group Structure, and Schedule

Products of the planning process defined in this section respond to the directives of the DRBC and the U. S. Water Resources Council (WRC). Work performed will generally correspond to the phased and iterative nature of the process, as prescribed in the guidelines established by the WRC for conducting Level B studies. While the work program, as previously defined, concentrates on major water management issues requiring resolution, it is the purpose of the Level B planning process to integrate these findings with the other planning elements in resource management to produce a recommended environmentally sound comprehensive plan for the basin. This section of the POS further presents the Work Group structure, study schedule of Level B activities and publications.

### A. Phases of Plan Development and Output

Phase 1. The first task in the planning process is the development of the Plan of Study (POS). This document serves as a management tool for the Study Manager, the Steering Committee, the individual participants, and the public in the conduct of the work. The POS through its analysis of the issues, problems, and opportunities in each functional or program area identifies the major work elements to be accomplished by the study. The POS, therefore, clarifies, expands, and details the work and the schedule for addressing the objectives and needs presented in the Proposal to Study (PTS). With the approval of the POS by DRBC, the remaining major phases of the study, described below, will be initiated.

Phase 2. Compilation of the Initial Plan: The initial single function plan for each functional area will be composed of ongoing agency programs and will reflect the basin planning setting in the absence of the Level B study. The Initial Plan will be aggregated at the same level of detail as other regional planning products. Information will be collected concerning water and related land resource management plans over the 25 years by functional area. The present solutions to the initial single function plan programs will be assembled into the Initial Plan.

Phase 3. First Cut Plan Development and Synthesis. A synthesis process will include parts or all of the following steps:

- a. The Initial Plan will be modified by developing a range of alternatives reflecting EQ and NED objectives. The alternatives or First Cut Plans will be screened, resulting in a plan containing one or more alternatives to each EQ and NED objective. The alternatives remaining will be the selected NED and EQ plans.
- b. The Mixed Objective Plan will be composed of one or more of the selected NED and EQ alternatives considered together, creating a plan composed of a compromise of the alternatives. Public involvement is anticipated for the purpose of obtaining feedback on the EQ and NED plans to be compared.



c. Comparison of the First Cut, Initial, and Mixed Objective Plans.

The effects on the NED and EQ objectives of the selected alternatives resulting from Steps a) and b) will be compared using the System of Accounts contained in the Principles and Standards as related to Level B planning for measuring the effect on the objectives. The comparison is intended to identify the key implications to be considered by decision makers if a particular plan or part of a plan were recommended. Public response to the specific decisions is anticipated.

Phase 4. Analysis of Tradeoffs and Selection of a Recommended Plan.

The key decisions necessary to implement the plans selected for comparison above will be listed and screened. The public will be presented the decisions in terms of tradeoffs, and their response will be summarized. The recommended plan will be compiled based upon the recommendations selected for each of the decisions. The necessary associated actions required and the role of all levels of government in implementing the recommended plan will be delineated. A draft study document will be prepared which will also contain a summary of the plan and an environmental impact statement.

These four phases of the Level B study are shown in Figure V-1. In these phases draft study documents will be subjected to a rigorous review procedure and analysis of environmental impacts of recommended actions. Opportunities for review and comment will be provided to the Steering Committee, the Study Advisory Committee, interested citizen groups, various planning boards, and federal and state agencies. The draft will then be revised to incorporate appropriate comments attained during the review process and the final report submitted to DRBC.

The final report, after action by DRBC, will be transmitted to the Water Resources Council for their review and submittal to the President and the Congress.





B. Work Group Structure

The Work Groups for Level B are designed to be responsive to three major functions:

Function No. 1, to integrate, coordinate, and provide an overview for all aspects of the study is the direct responsibility of the Study Steering Committee. It will address among other things the development of the POS, the application of the two major national objectives of NED and EQ, the overall monitoring of the work program; and the formulation of the final recommended plan through synthesis of all relevant facts and reports of the Work Groups. Each State will appoint a Level B State Coordinator to assist the State representative on the Study Steering Committee. The Coordinator will insure coordination and cooperation between State and Level B planning by monitoring the assembling of State data and reporting on State policies, programs and plans.



FIGURE V-1  
Delaware River Basin Comprehensive Study  
Planning Process

	Phase 1 (20%)*	Phase 2 (15%)*	Phase 3 (40%)*	Phase 4 (25%)*
Work Task	<ol style="list-style-type: none"> <li>1. Identify functional areas.</li> <li>2. Analyze complete spectrum of problems within each functional area.</li> <li>3. Identify Level B study focuses, including interfaces between focuses.</li> <li>4. Assign priorities to study focuses.</li> </ol>	<ol style="list-style-type: none"> <li>1. Specify direction and scope of planning for each focus.</li> <li>2. Develop initial "single function" plan in the absence of Level B planning.</li> <li>3. Develop work plans for each study team.</li> </ol>	<ol style="list-style-type: none"> <li>1. For each functional area:               <ol style="list-style-type: none"> <li>a.) Formulate 1st cut plan.</li> <li>b.) Formulate one or more "Economic Development" and "Environmental Quality" alternative plans.</li> <li>c.) Identify key decisions for plan implementation.</li> <li>d.) Formulate one or more "mixed objective" alternative plans.</li> </ol> </li> <li>2. Compare beneficial and adverse effects of selected alternative plans.</li> </ol>	<ol style="list-style-type: none"> <li>1. Screen key decisions needed for implementation.</li> <li>2. Present "trade-offs" between plans.</li> <li>3. Solicit and summarize public response to alternative plans.</li> <li>4. Recommend a Level B plan and specify associated actions.</li> </ol>
Major Products	 Plan of Study	 "Initial" Plan	 Selected Economic Development, Environmental Quality and Mixed Objective Alternative Plans	 Study Report and Summary

\* Approximations in Level B planning effort by study phase



Function No. 2. to marshall technical and professional resources for each functional or program area, is best performed by Work Groups formed by federal, state experts in their specialized fields. These Work Groups will be assigned the responsibility to identify alternate solutions, their consequences and possible tradeoffs in seeking optimum NED and EQ objectives.

Function No. 3. to evaluate existing proposed major water management structures, is a specialized undertaking. Presently proposed structures, in particular possible alternative surface water storage projects, must be reconsidered in terms of current estimates of economic social and environmental costs.

\*\*\*\*\*

This Work Group section of the POS presents the organization, membership and functional area assignments of the various Work Groups to be created to carry out the Level B work programs as defined in earlier POS sections. While Work Group membership is defined here, representation on each group should remain flexible based both on needs for additional informational and interface needs between other functional areas under study.

In addition to the Study Steering Committee, six basic Work Groups in the Delaware River Level B study will be required. These include Work Groups for combinations of related functional or program areas having problems or opportunities in common and one special Work Group to evaluate existing major proposed projects. Each will have a chairperson and receive Level B staff support.

The Work Groups and their membership are shown in the accompanying Table V-1. As indicated the States of Delaware, New Jersey, New York and Pennsylvania will participate in all Work Groups. Such participation will involve preparation for and attendance at meetings and reviews of draft materials in the various functional areas considered by each Work Group.

Specific work elements to be addressed by each Work Group and performed in part by the States are listed under their functional heading in the section of the POS on Work Elements. Level B central staff resources and specific work to be performed by each Federal agency is listed in the following section on study budget. Using these materials and specifications of state work elements detailed directives for each Work Group, schedules of their work outputs during the remaining three phases of the study and listing of actual participants will be developed by the staff in consultation with Federal and State members and be approved by the Study Manager. (See Table V-1)

While both Federal and State participation is expected in each Work Group, only the Federal role and the collective State effort in monetary terms can be defined in the POS. Each of the four State Level B Coordinators will, as described below, define his respective State's participation in these Work Groups as governed by respective local problems within the State's commitment of in-kind services and the funds made available.



TABLE V-1

# Federal+ State Membership on Workgroups by Function

WORKGROUP	FEDERAL								STATES
	USDA	DOI	EPA	COE	FPC	DOT	DOC	HUD	STATES
<b>FUNCTION 1</b>									
Study Steering Committee	X	X	X	X	X	X	X	X	X
<b>FUNCTION 2</b>									
Water Quality	X		X						X
Water Supply (Groundwater and Streamflow)		X	X	X	X				X
Flood Loss Reduction	X			X				X	X
F+WL+Recreation		X							X
Energy and Navigation				X	X	X	X		X
<b>FUNCTION 3</b>									
Evaluation of Proposed Structural Measures				X					X

All workgroups open to public participants

For purposes of the Delaware River Level B Study, certain guidelines will be recognized by each Work Group:

Funding Flexibility--Funding allocations for each participating Federal agency as represented on the Steering Committee are shown in the POS. Adjustments in the distribution to each assigned work element of up to ten percent and not to exceed \$5,000 of each can be made among the tasks assigned, at the discretion of the Federal agency and in concert with the Study Manager. Any adjustment beyond this percentage or amount will require written concurrence from the Study Manager. Funding allocations by each State are the responsibility of each Level B Steering Committee representative, who is to insure that both in-kind service and service contract funds (MOA) are expended in the manner most beneficial to accomplishing the work presented in the POS. The Level B Steering Committee representative, shall within 60 days of approval of the POS submit allocations of total State funds for the period of the study. Once these state allocations have been approved, the Steering Committee representative, at his discretion with notice to the Study Manager, may make adjustments between work elements within a functional area, of up to ten percent and not to exceed \$5,000. Written concurrence by the Study Manager is required if greater percentages or amounts are involved.



In the event, a Federal or State bureau finds that a specific work element or a portion thereof can be better performed by another governmental agency, the necessary transfer of funds can be undertaken by acceptance of agencies involved and with the written concurrence of the Study Manager and conformance with WRC policy.

Cost Accounting--Participating agencies (Federal and State) will submit to the Study Manager a current list (with names and addresses) of personnel assigned to provide technical and professional services on each portion of Level B, including Work Groups, technical committees, etc. This list is essential as the basis of Level B maintenance of certain cost records. No credits for in-kind services by the States, exclusive of appointments previously made, can be provided until such lists are submitted and accepted by the Study Manager.

Responsibilities--Federal and State personnel as study participants are expected to advise and consult with Level B staff and other Federal, State and local agencies including public participants; attend special meetings and hearings as necessary in the execution of the study; make available all data and other information pertinent to the study; and review, comment, and make judgments and recommendations as appropriate.

Reports--Each participating Federal and State Steering Committee representative will submit brief study progress and expenditure reports on a regular basis to be specified in Memoranda of Agreement with Level B, and a final report at the conclusion of the study program.

### C. Study Schedule

The following Table shows the overall schedule and activities for the study. The major control points for the study are the approval of the POS by the DRBC (May 1977); the completion of an Initial Plan (September 1977); selection of a Recommended Plan (October 1978); preparation of a Summary Report and an environmental impact statement (EIS) (January 1979); Final Report presentation to DRBC and transmittal to WRC (April 1979).

The frontispiece figure shows the planning process schedule by major study phases and three workshop sessions for the general public. These workshops each consisting of meetings held in the upper, middle and lower portions of the Basin, are scheduled to present major outputs of the study for public review, comment and feedback and will supplement the on-going public participation program described in other sections of the POS.



TABLE V-2

DELAWARE RIVER BASIN COMPREHENSIVE STUDYSCHEDULE OF ACTIVITIES AND PUBLICATIONS

STUDY SCHEDULE	ACTIVITY OR PUBLICATION	START	COMPLETE
	Initiate Study	10/15/76	
	Plan of Study (POS) Approval by the Delaware River Basin Commission		5/25/77
	Prepare Initial Plan	6/ 1/77	9/ 1/77
	Public Workshop	9/15/77	10/ 1/77
	Formulate First Cut Plans	9/ 1/77	3/ 1/78
	Public Workshop	3/15/78	4/ 1/78
	Alternative Plan Iterations:		
	a) Plan Synthesis and Development	3/ 1/78	
	b) Analyze Tradeoffs and Select a Recommended Plan		10/ 1/78
	Public Workshop	10/ 1/78	10/15/78
	Prepare Summary, Preliminary Report, Environmental Impact Statement	10/ 1/78	1/30/79
	Draft Plan for Review	1/30/79	3/ 1/79
	Final Report Preparation for DRBC		
	Transmit to Water Resources Council		4/30/79



## VI. Budget

Table VI-1 shows the sources by agency of the total \$1,532,000 for Level B. Of this total, \$1,100,000 is a Water Resources Council Federal grant (Section 209, P.L. 92-500) and \$432,000 is composed of a commitment from member States and local sources (\$200,000), and from the Delaware River Basin Commission (\$232,000), in the form of in-kind services. The study budget is distributed equally between the first year (June 1, 1977 through May 31, 1978) and the second year (June 1, 1978 through April 30, 1979, the end of the study). The \$115,000 WRC advance to prepare the POS is included in the first year's budget allocation.

Table VI-2 shows the distribution of the total study funds by budget element. This includes the cost breakdowns by functional area, attendance and preparation for the Study Steering Committee, administrative activities, state coordination, contractual services and that amount presently unallocated. Public Participation is not shown as a budget item but is anticipated to be approximately ten percent of Level B staff activity or \$75,000.

Table IV-1, in Section IV, shows the budget allocation for Level B staff, States (collectively) and the several Federal agencies for all functional areas by work element. It should be noted that Table IV-1 does not include the \$50,000 of contract services for coordination with each State (the total shown in Table VI-2 of \$200,000 for State Coordination) or the \$30,000 for contract services for consultant support in the review of Federal and State environmental legislation (also shown in Table VI-2).

Table VI-3 shows the distribution of total study funds by Federal agency.

Table VI-4 shows the specific tasks performed by the various Federal agencies.

Table VI-5 shows the distribution of non-federal in-kind contributions for the total study.



TABLE VI-1

## DISTRIBUTION OF TOTAL STUDY FUNDS BY AGENCY

Agency	Total Allocation	Allocation <sup>1</sup> First Year	Allocation <sup>2</sup> Second Year
WRC for Federal Agencies	\$400,000	\$200,000	\$200,000
WRC for DRBC Level B Staff	500,000	250,000 <sup>3</sup>	250,000 <sup>4</sup>
WRC for State Coordination <sup>5</sup>	200,000	100,000	100,000
In-Kind Contribution, DRBC	232,000	116,000	116,000
In-Kind Contribution, State	170,000	85,000	85,000
In-Kind Contribution, Local and Regional	30,000	15,000	15,000
<b>TOTAL STUDY FUNDS</b>	<b>\$1,532,000</b>	<b>\$766,000</b>	<b>\$766,000</b>
WRC Funds	\$1,100,000	\$550,000	\$550,000
DRBC, State, Regional and Local In-Kind Services	432,000	216,000	216,000

- <sup>1</sup> First year of study, after POS approval, targeted for June 1, 1977 through May 31, 1978.
- <sup>2</sup> Second year of study targeted for June 1, 1978 through April 30, 1979. Breakdown between first and second year of study is approximate. Scheduling of activities will be roughly split between the first and second study years
- <sup>3</sup> Includes \$115,000 advanced to DRBC by WRC to prepare Plan of Study (POS).
- <sup>4</sup> Second year payment for DRBC due April 1, 1978.
- <sup>5</sup> Funds for States Coordination to be disbursed by DRBC.



TABLE VI-2

BUDGET ALLOCATION FOR THE LEVEL B STUDY BY BUDGET ELEMENTSTOTAL DURATION OF STUDY

(Thousand dollars)

Budget Elements	Level B Staff <sub>1</sub>	State <sub>2</sub>	Local & Regional Agencies <sub>2</sub>	Federal,	TOTAL
Economic Development	38	(14)		26	78
Environmental Resources	84	(18)		39	141
Water Quality	70	( 7)		45	122
Water Supply	75	(19)		31	125
Stream Flow	44	(17)		10	71
Groundwater	49	(14)		75	138
Flood Loss	48	( 7)		11	66
Recreation	22	( 7)		25	54
Fish and Wildlife	14	(16)		18	48
Energy	18	(11)		23	52
Navigation	25	( 8)		10	43
Evaluation Projects	65	(16)		55	136
Subtotal	552	(154)		368	1074
Attendance and Preparation Study Steering Comm.	40	(16)	(30)	32	118
Administrative	30				30
State Coordination		200 <sub>4</sub>			200
Contractual Services	50				50
Presently Unallocated	60				60
Totals	732	370	(30)	400	1532
WRC Funds	500	200		400	1100
State--DRBC--Regional Contribution	232	(170)	(30)		432

<sub>1</sub> This column includes WRC and Commission funded staff salary and overhead plus a contractual services item.

<sub>2</sub> Amounts in parenthesis in-kind support, remainder WRC funds.

<sub>3</sub> WRC funds.

<sub>4</sub> This amount distributed as \$50,000 to each basin state.



TABLE VI-3

DISTRIBUTION OF LEVEL B STUDY FUNDS FOR FEDERAL AGENCIESTOTAL STUDY

<u>AGENCY</u>	<u>AMOUNT</u>
Corps of Engineers	\$116,000
Department of Interior	105,000
Department of Agriculture	133,000
Federal Power Commission	20,000
Department of Commerce	9,000
Department of Transportation	9,000
Environmental Protection Agency	4,000
Housing and Urban Development	4,000
<b>TOTAL</b>	<b>\$400,000</b>



TABLE VI-4  
DISTRIBUTION OF FEDERAL AGENCY FUNDS BY TASK DESCRIPTION

DEPARTMENT OF AGRICULTURE (USDA)			
Cost Allocation	Related* Work Element	Department Subdivision	Task Description
			<u>ECONOMIC DEVELOPMENT</u>
\$11,000	1A	ERS	Provide agricultural projections by Commission sub-basin to enable subsequent development of depletive water use.
15,000	1D	SCS	Identify consistent water quality, allocation and other strategies appropriate for encouraging agriculture in the basin.
			<u>ENVIRONMENTAL RESOURCES</u>
10,000	2A	SCS	Inventory existing soil and terrain suitabilities.
10,000	2D	SCS	Evaluate land capability for waste disposal.
5,000	2F	SCS	Assist in overall environmental analysis of the Level B plan.
6,000	2A	FS	Identify forest lands, practices, production, pollution potential.
			<u>WATER QUALITY</u>
5,000	3C	SCS	Estimate waste generation for projected agricultural activities.
10,000	3H	SCS	Determine erosion amounts and historical trends.
25,000	3J	SCS	Analyze non-point pollution in West Branch, Delaware River Watershed.
3,000	3J	FS	Study of Erosion and Sedimentation from harvesting operations.
2,000	3J	ERS	Economic effects of agricultural land management alternatives.

\* See Section IV, tabulation of Work Elements.



(continued)

DEPARTMENT OF AGRICULTURE (USDA)

Cost Allocation	Related Work Element	Department Subdivision	Task Description
25,000	4A	ERS	<u>WATER SUPPLY</u> Project depletive water use due to agricultural activity.
\$ 2,000	7A	SCS	<u>FLOOD LOSS</u> Define needs for expanded flood loss reduction program.
4,000		SCS	<u>STUDY STEERING COMMITTEE</u> Preparation for and attendance at Study Steering Committee meetings.
\$133,000	TOTAL		



TABLE VI-4

## DEPARTMENT OF THE INTERIOR (DOI)

Cost Allocation	Related Work Element	Department Subdivision	Task Description
			<u>ENVIRONMENTAL RESOURCES</u>
\$ 8,000	2A	GS	Provide LUDA mapping, including interpretation and quantification of land uses and land cover by Commission sub-basin.
			<u>STREAM FLOW</u>
8,000	5A	GS	Provide statistical analysis of frequency of recurrence of extreme events using natural flow data.
2,000	5C	GS	Provide guidance on the role of groundwater withdrawal as it effects stream flow.
			<u>GROUNDWATER</u>
40,000	6E	GS	Investigate interrelationship of groundwater and stream flow in Coastal Plain region as a result of the conjunctive use of both as a water supply.
			<u>RECREATION</u>
23,000	8A, B	BOR*	Coordinate data gathering, SCORP compatibility, problem assessing and plan formulation seminars to ascertain needs, develop solutions and identify areas for further investigation. Identify opportunity deficiencies, urban opportunity enhancement and promulgate institutional arrangements.
2,000	8B	NPS	Outline and evaluate proposed plans for DWGNRA and integrate with basin-wide plan.

\* At request of BOR, \$20,000 will be reallocated, through DRBC, to the State recreational liaison officers.



(continued)

## DEPARTMENT OF THE INTERIOR (DOI)

Cost Allocation	Related Work Element	Department Subdivision	Task Description
\$ 9,000	9A	F&W	<u>FISH AND WILDLIFE</u> Inventory present and/or threatened fish and wildlife and their enhancement potential including economic value of increased fisheries and assessment of related programs e.g. anadromous fish improvement.
9,000	9B	F&W	Determine habitat requirement with emphasis on delineating problem areas and developing recommendations for maintenance and/or improvement of habitat conditions, e.g. flow and temperature criteria and estimated cost of alternative solution.
4,000			<u>STUDY STEERING COMMITTEE</u> Preparation for and attendance at Study Steering Committee meetings.
\$105,000	TOTAL		



TABLE VI-4

## U. S. ARMY CORPS OF ENGINEERS (COE)

Cost Allocation	Related Work Element	Department Subdivision	Task Description
\$ 3,000	4E		<u>WATER SUPPLY</u> Provide advice on technical feasibility of high-flow skimming of the Delaware River for storage.
35,000	6E		<u>GROUNDWATER</u> Provide cost estimates for conjunctive use of ground and surface water for water supply in Coastal Plain region.
5,000	7A		<u>FLOOD LOSS</u> Summarize impact of existing flood protection measures (Corps projects).
4,000	7B		Assist in investigation of flood plain conservation easements and land acquisition to alleviate flood damage.
3,000	11B		<u>NAVIGATION</u> Assist in review of environmental aspects of the proposed deepwater port in Delaware Bay.
5,000	11D		Quantify and show trends of the amounts and sources of sediment deposited in the dredged portion of the tidal Delaware.
2,000	11E		Delineate proposed or possible navigation projects.



(continued)

## U. S. ARMY CORPS OF ENGINEERS (COE)

Cost Allocation	Related Work Element	Department Subdivision	Task Description
\$ 55,000	12A, B		<u>EVALUATION OF CURRENT PROPOSED STRUCTURAL MEASURES</u> At a reconnaissance level, update cost/benefit reevaluation of Maiden Creek, Aquashicola, Prompton (modified), Frances E. Walter (modified) and Hackettstown projects. Assist in environmental review of these projects.
4,000			<u>STUDY STEERING COMMITTEE</u> Preparation for and attendance at Study Steering Committee meetings.
\$116,000	TOTAL		



TABLE VI-4

## FEDERAL POWER COMMISSION (FPC)

Cost Allocation	Related <sup>1</sup> Work Element	Department Subdivision	Task Description
\$ 3,000	4A		<u>WATER SUPPLY</u> Assist in projections of depletive water demands for electric power generation.
2,000	10A		<u>ENERGY</u> Assist in assessing adequacy of DRB thermal pollution control and water supply mechanisms to prevent adverse impact of energy development on water resources.
4,000	10B		Assist in evaluation of electric utilities master siting studies.
2,000	10C		Assist in determination of probability of DRB becoming a major energy exporter from OCS or anthracite regions. Assess environmental aspects thereof.
5,000	10D		Assist in evaluation of hydropower potential.
4,000			<u>STUDY STEERING COMMITTEE</u> Preparation for and attendance at Study Steering Committee meetings.
\$ 20,000	TOTAL		



TABLE VI-4

## ENVIRONMENTAL PROTECTION AGENCY (EPA)

Cost Allocation	Related Work Element	Department Subdivision	Task Description
4,000			<u>STUDY STEERING COMMITTEE</u> Preparation and attendance at Study Steering Committee meetings.
\$4,000	TOTAL		



TABLE VI-4

DEPARTMENT OF COMMERCE (DOC)

Cost Allocation	Related Work Element	Department Subdivision	Task Description
\$ 5,000	10C	NOAA	<u>ENERGY</u> Assist in determination of probability of DRB becoming a major energy exporter as result of OCS development. Assess environmental aspects thereof.
4,000			<u>STUDY STEERING COMMITTEE</u> Preparation for and attendance at Study Steering Committee meetings.
\$ 9,000	TOTAL		



TABLE VI-4

## DEPARTMENT OF TRANSPORTATION (DOT)

Cost Allocation	Related Work Element	Department Subdivision	Task Description
\$ 5,000	10C	Coast Guard	<u>ENERGY</u> Assist in determination of probability of DRB becoming a major energy exporter from OCS or anthracite regions. Assess environmental aspects thereof.
4,000			<u>STUDY STEERING COMMITTEE</u> Preparation for and attendance at Study Steering Committee meetings.
\$ 9,000	TOTAL		



TABLE VI-4

## DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT (HUD)

Cost Allocation	Related Work Element	Department Subdivision	Task Description
\$ 4,000			<u>STUDY STEERING COMMITTEE</u>  Preparation for and attendance at Study Steering Committee meetings.
\$ 4,000	TOTAL		



TABLE VI-5

DISTRIBUTION OF NON-FEDERAL IN-KIND CONTRIBUTIONSTOTAL STUDY

<u>Non-Federal Entity</u>	<u>Amount</u>
State of New York	\$ 50,000
State of New Jersey	50,000
State of Pennsylvania	50,000
State of Delaware	20,000
Local and Regional Agencies	30,000
TOTAL	<u><u>\$200,000</u></u>



APPENDIX







LEVEL B STUDY STEERING COMMITTEE

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Special Assistant to the Secretary  
U. S. Department of the Interior  
Office of the Secretary, Northeast Region  
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(302) 678-4761

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Office of the Secretary  
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Environmental Resource Planning  
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Philadelphia, Pennsylvania 19107  
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WALD, Leon Y. (Cmdr.)  
United States Coast Guard  
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Washington, D. C. 20590  
(202) 426-2262



STUDY STEERING COMMITTEE MEMBERS

AND ALTERNATES

AGENCY:

REPRESENTATIVE/ALTERNATE

Delaware Department of Natural Resources and  
Environmental Control

John T. Egan/Member

Federal Power Commission

Martin Inwald/Member  
Peter G. Coffey/Alternate

New Jersey Department of Environmental  
Protection

Robert E. Cyphers/Member  
Harry A. Ike/Alternate

New York Department of Environmental  
Conservation

Edward A. Karath/Member

Office of the Federal Representative--DRBC

Barbara Shipler/Observer

Pennsylvania Department of Environmental  
Resources

William N. Frazier/Member

U. S. Army Corps of Engineers

John F. Murphy/Member

U. S. Department of Agriculture/Soil  
Conservation Service

Richard Marston/Member

U. S. Department of Commerce

Al Funai/Member

U. S. Department of the Interior

Roger Babb/Member  
Robert Ryder/Alternate\*

U. S. Department of Transportation

Cdr. Leon Y. Wald/Member

U. S. Department of Housing and Urban  
Development

Lawrence Levine/Member

U. S. Environmental Protection Agency

Edward V. Geismar/Member

\* Served with distinction from Study inception to April 1, 1977 when reassigned to other duties.



LEVEL B STUDY STEERING COMMITTEE  
(contd.)

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SHIPLER, Barbara (Mrs.)  
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(202) 343-5761



DRBC STANDING COMMITTEES

Hydrology Coordinating Committee

Fisheries & Wildlife Technical Assistance Committee

Water Quality Advisory Committee

Delaware Estuary Committee



# LOCAL GOVERNMENTAL AGENCIES

1. Areawide Clearing Houses (A-95 Review Process)
2. Areawide 208 Designated Agency (Water Quality Management Planning)
3. Planning or other governmental agency

Agency	Agency
1. Tri-State Regional Planning Comm. J. Douglas Carroll 1 World Trade Center, 56 South New York, New York 10048	1. Office of the County Planning Director Nancy Shukaitis, Executive Director Sussex County Planning Board P. O. Box 69 Newton, New Jersey 07860
1. Atlantic City Planning Board Gregory Crescenzo, Acting 730 Guarantee Trust Atlantic City, New Jersey 08	1. Warren County Planning Board Russell A. Miles, Executive Director 234 William Street Alpha, New Jersey 08866
1.2. Delaware Valley Regional Planning Commission Mr. Walter Johnson Penn Towers Building, 3rd Floor 1819 John F. Kennedy Boulevard Philadelphia, Pennsylvania 19103	1. Southern Tier East Regional Planning Board Stanley I. Hayes, Jr. Box 1766 Broome County Office Building Binghamton, New York 13902
1. Cumberland County Planning Board John J. Holland 800 Commerce Street Bridgeton, New Jersey 08302	1. Joint Planning Commission Lehigh- Northampton Counties Michel Kaiser, Executive Director Government Building, ABE Airport P. O. Box 2087 Lehigh Valley, Pennsylvania 18103
1. Wilmington Metropolitan Area Planning and Coordinating Council (WILMAPCO) James A. Tung Cross Roads Shopping Center New Castle, Delaware 19720	1. Berks County Planning Commission Scott Keefer, Executive Director Court House Wilkes-Barre, Pennsylvania 18702
1.2. Cape May County Planning Board Elwood R. Jarmer County Court House Cape May, New Jersey 08210	1. Luzerne County Planning Commission Edward Heiselberg, Executive Director Court House Wilkes Barre, Pennsylvania 18702
1. Hunterdon County Planning Board W. Dumont Van Doren Administrative Building Main Street Flemington, New Jersey 08822	1. Economic Development Council of Northeast Pennsylvania Howard Grossman, Executive Director P. O. Box 777 Avoca, Pennsylvania 18641



LOCAL GOVERNMENTAL AGENCIES  
(continued)

AGENCY

2. New Castle County 208 Agency  
Ms. Merna Hurd  
1 Peddler's Row  
Peddler's Village  
Newark, Delaware 19702
2. Coastal Sussex Water Quality Program  
John D. Wik, Executive Director  
139 E. Market & R.R. Avenues  
P. O. Box 507  
Georgetown, Delaware 19947
3. Montgomery County Planning Commission  
Arthur F. Leoben, Executive Director  
Court House  
Norristown, Pennsylvania 19404



INDUSTRIAL, UTILITY, BUSINESS & ENVIRONMENTAL ASSOCIATIONS

Pennsylvania Chamber of Commerce  
222 N. 3rd Street  
Harrisburg, Pennsylvania 17101

New Jersey State Chamber of Commerce  
East State Street  
Trenton, New Jersey 08

Delaware State Chamber of Commerce  
1102 W. Street  
Wilmington, Delaware 19801

New York State Chamber of Commerce & Industry  
65 Liberty Street  
New York, New York 100

Delaware Valley Council  
John J. McGarry  
1612 Market Street  
Philadelphia, Pennsylvania 19103

Society for Environmental & Economic  
Development (SEED)  
Lewis Applegate  
Suite 1022, Inn of Trenton  
240 W. State Street  
Trenton, New Jersey

Allentown-Lehigh County Chamber of Commerce  
462 Walnut Street  
Allentown, Pennsylvania 18105

Greater Philadelphia Chamber of  
Commerce (PENJERDEL)  
1528 Walnut Street  
Philadelphia, Pennsylvania 19102

New Jersey Chapter Sierra Club  
360 Nassau Street  
Princeton, New Jersey 08640

Interleague Council of the DRB  
Dorothy B. Batchelder  
R. D. #1  
New Hope, Pennsylvania 18938

Pollution Control Group of  
Lower Bucks County  
Mrs. L. P. Leahy  
728 N. Pennsylvania Avenue  
Morrisville, Pa. 19067

Save the Delaware Coalition  
Harold A. Lockwood, Jr.  
2126 Land Title Building  
Philadelphia, Pennsylvania 19110

The Mid-Atlantic Council of  
Watershed Association  
Ned Harrington, President  
2955 Edgehill Road  
Huntington Valley, Pa. 19006

Delaware River Basin Electric  
Utilities Group  
Roger D. Ley  
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Reading, Pennsylvania 19603

Water Resources Association  
Paul M. Felton  
901 Stephen Girard Building  
21 South 12th Street  
Philadelphia, Pennsylvania 19107

Association of New Jersey  
Environmental Commissions  
P. O. Box 157  
Medham, New Jersey 07945

Upper Delaware River Association  
P. O. Box 92  
Equinunk, Pennsylvania 18417

Upper Delaware Scenic River Assn.  
Secretary  
Calicoon, New York 12723

Izaak Walton League of America  
Harvey Adams  
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Delaware Wild Lands, Inc.  
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Philadelphia, Pennsylvania 19121

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American Conservation Assn., Inc.  
30 Rockefeller Plaza  
New York, New York 10020

Catskill Center for Conservation  
and Development, Inc.  
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New York State Conservation  
Council, Inc.  
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Sierra Club of Delaware  
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Pennsylvania Chapter Sierra Club  
Dr. Richard Pratt  
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The Sierra Club Atlantic Chapter  
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Environmental Improvement Commission  
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Delaware State Grange  
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New Jersey Farm Bureau  
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Pennsylvania State Grange  
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Pennsylvania Farm Association  
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New Jersey Conservation Federation  
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Lenni Lenape League  
Henry W. Smith  
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Delaware Valley Conservation  
Association  
Mina Haeefe  
River Road  
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Federation of Fly Fishermen  
Philip Chase

AFL/CIO  
John Brown, Sec./Treasurer  
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Environmental Defense Fund  
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Monroe County  
Stroudsburg, Pennsylvania 18360

American Conservation Association  
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New York, New York 10020

Natural Area Council  
145 East 22nd Street  
New York, New York 10022

National Parks and Conservation  
Association  
1701 - 18th Street, N.W.  
Washington, D. C. 20009

ULI - The Urban Land Institute  
1200 - 18th Street, N.W.  
Washington, D. C. 20036

American Fisheries Society  
1319 - 18th Street, N.W.  
Fourth Floor  
Washington, D. C. 20036

National Association of Conservation  
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Washington, D. C. 20005

Delaware County Conservation  
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Delaware River and Bay Authority  
William J. Miller, Jr.  
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## B. SUMMARY, GOALS AND OBJECTIVES, WRC NEW APPROACH TO LEVEL B PLANNING

### THE NEW APPROACH \*

#### Task Committee's Report

The Task Committee's proposed program, as adopted by the Council, for the new Level B planning approach, has the following main characteristics:

1. Section 209 is recognized as an important and essential vehicle for integrating all related land and water planning programs. A Level B study, conducted under the mandates of the Water Resources Planning Act of 1965 (P.L. 89-80) and Section 209 of the Federal Water Pollution Control Act Amendments of 1972 (P.L. 92-500) and organized and funded to guarantee the participation of key entities with natural resource responsibilities and capabilities, is the most effective device for achieving the integration of a wide range of natural resource planning programs.
2. Studies are to address major Federal and non-Federal issues requiring near and mid-term (15 to 25 years) solutions and are to identify major data gaps, unmet needs, and requirements for additional studies by others (both Federal and non-Federal) in implementation of Level B plans.
3. A strong participating and leadership role by the States is essential for effective Level B planning. It is the policy of both the President and the Congress to strengthen the role of the States in natural resource decisionmaking.
4. The need for minimal Federal funding to the States is acknowledged and provided for in the proposed program in order to insure timely State planning inputs.
5. Commitments by the States to address critical State issues and to delineate components of the study objectives that relate to State needs and opportunities are required.
6. It is recognized that water quality problems are inseparable from water quantity and land management problems and that local, State, and Federal commitments on water and land resources should not be made without joint concurrent consideration.
7. An accelerated Level B program would contribute to integrated and balanced water quality programs (a) by emphasizing and defining on a river basin or regional basis, abatement programs to be implemented by the States and appropriate Federal agencies; and (b) by supplementing and thereby increasing the effectiveness of pollution abatement measures outlined in Areawide Waste Treatment Management Plans prepared under Section 208 and Section 303(e) of P.L. 92-500.

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\* Summary contained in Water Resources Council, Second Annual Report to Congress on Level B Planning, 1974



The New Approach (continued)

8. A Level B planning program will support land use, coastal zone management, and rural area development planning efforts. It is believed to be the only program sufficiently developed at this time (or in the immediate future) to integrate existing programs.
9. A two-year limitation is placed on each Level B study.
10. A typical Section 209 study is estimated to cost approximately \$750,000 to \$1,000,000.
11. The program look to RBC's for leadership in areas where RBC's are organized and to other WRC designated persons or entitled for leadership in areas where RBC's do not exist. In all cases, however, the State concerned would be expected to be partners in Level B planning and would provide leadership in predetermined geographical and functional areas.



Level B (Section 209) Planning--New Approach

Specific Goals and Objectives

- to integrate functional or program planning where the programs impact on one another and on the water and land resource base.
- to insure that areawide and local waste treatment management planning is in harmony with comprehensive resource management planning.
- to protect, restore and/or improve the region's environmental quality.
- to reduce through multiobjective planning: economic losses; threats to life and health; the cost of emergency, evacuation, and disaster relief programs; and the loss of public revenues through the reduction of the tax base and the reduction of casualty losses by fostering a unified program of flood plain management.
- to promote analyses of alternative waste management systems and the application of emerging technology in cooperation with EPA, the States and others involved, based upon considerations of all sources of pollution, including point and non-point sources and agricultural return flows.
- to provide for improvements in navigation and coastal and shoreline management.
- to develop water supplies for diverse uses, including among many other uses, cooling water for power developments.
- to identify the need for and foster the implementation of needed conservation programs.
- to provide increased recreational and other leisure time opportunities requiring water and related land resources.
- to identify potential wilderness areas, wild and scenic rivers, parks, open space, green space and other natural amenities.

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\* to WRC Second Annual Report to Congress on Level B Planning, 1974.



## C. GLOSSARY

### TERMS AND ABBREVIATIONS USED IN LEVEL B STUDY INCLUDE:

#### Alternative

Future.....One of many possible situations, events, outcomes or standards of living which may prevail in some year(s) hence if certain decisions are made today.

Basin.....(See Delaware River Basin)

BOR.....Bureau of Outdoor Recreation, U. S. Department of the Interior

COE.....Corps of Engineers, U. S. Army

CZM.....Coastal Zone Management, National Oceanic and Atmospheric Administration

#### Delaware River

Basin.....The land and water areas included within the natural hydrologic drainage area (of the Delaware River)

DNREC.....Delaware Department of Natural Resources and Environmental Control--State agency with jurisdiction over natural resource management issues and programs.

DOC.....Department of Commerce, U. S.

DOI.....Department of the Interior, U. S.

DOT.....Department of Transportation, U. S.

DRBC.....Delaware River Basin Commission

DRBEUG.....Delaware River Basin Electric Utilities Group

DWGNRA.....Delaware Water Gap National Recreation Area

EIS.....Environmental Impact Statement

EPA.....Environmental Protection Agency, U. S.

ERS.....Economic Research Service

EQ Plan.....Environmental Quality Plan--A proposal which includes a series of recommendations which would achieve the national objective to enhance the quality of the environment by the management, conservation, preservation, creation, restoration, or improvement of the quality of certain natural and cultural resources and ecological systems.

Estuary.....Tidal portion of the Delaware River.



## GLOSSARY (continued)

- First Cut Plan.....A proposal which is developed early in the Level B process. It is an expanded single purpose plan and consists of several alternative futures to the initial plan including NED and EQ alternatives.
- Foci.....Special topics of concern within the identified functional areas.
- FPC.....Federal Power Commission
- FS.....Forest Service, U. S. Department of Agriculture
- Functional Area....Category in which to address water and related land resource management problems, opportunities, and needs.
- FWPCAA.....Federal Water Pollution Control Act Amendments
- F&WS.....Fish and Wildlife Service, U. S. Department of the Interior
- HUD.....Housing and Urban Development, U. S. Department of
- Initial Plan.....A proposal which is a composite representation of existing water and related land management plans.
- Level A Study.....Framework study or assessment of water resources of a broad geographical area; sponsored by U. S. Water Resources Council; generally long range (25 years and beyond); leads to the identification of regions or basins with complex water and related land resource problems and may recommend further plans if necessary.
- Level B Study.....Regional or river basin study sponsored by the U. S. Water Resources Council with 15-25 year planning horizon; addresses more specific issues than those identified in the Level A studies; leads to identification of action plans to be pursued by individual federal, state, local and private interests.
- Level C Study.....Implementation site specific study or project feasibility study, generally undertaken by a single federal, state, local or private interest for a particular purpose.
- LUOA.....Land Use Data Acquisition, USGS aerial photographic program.
- Mixed Objective  
Plan.....Plan which considers both the NED and EQ plans simultaneously. It represents a compromise between the selected NED and EQ plans.
- MOA.....Memorandum of Agreement



## GLOSSARY (continued)

- Modified First Cut Plan.....A more developed and sensitive First-Cut Plan which sets out more defined NED and EQ alternatives.
- NARS.....North Atlantic Regional Study conducted by the U. S. Army Corps of Engineers, the Level A or framework study for the Delaware River Basin Level B study.
- NED Plan.....National Economic Development Plan--A series of recommendations which would maximize the national objective to use the water resources to enhance national economic development by increasing the value of the Nation's output of goods and services and improving national economic efficiency.
- NJDEP.....New Jersey Department of Environmental Protection--State agency with jurisdiction over natural resource management issues and programs.
- NOAA.....National Oceanic and Atmospheric Administration
- NPS.....National Park Service, U. S. Department of the Interior
- NYDEC.....New York State Department of Environmental Conservation--State agency with jurisdiction over natural resource management issues and programs.
- OCS.....Outer Continental Shelf--Seaward subaerial portion of the Outer (Atlantic) Coastal Plain.
- P.L.....Public Law
- PennDER.....Pennsylvania Department of Environmental Resources--State agency with jurisdiction over natural resource management issues and programs.
- POS.....Plan of Study
- Principles.....Provide broad policy framework for planning activities and include the conceptual basis for planning.
- Principles and Standards.....Guidelines promulgated by the Water Resources Council for programs and projects mandated by P.L. 89-80, the Water Resources Planning Act of 1965. (For more detailed definition of Principles and Standards, refer to Principles and Standards.)
- PTS.....Proposal to Study, the Planning Proposal for the Level B study submitted to Water Resources Council in June 1975.
- Recommended Plan...A synthesis of the single issue mixed objective plans. It consists of a set of recommendations on how to resolve key decisions that emerged from the set of plans developed earlier in the planning process.



## GLOSSARY (continued)

- SCORP.....State Comprehensive Outdoor Recreation Plans,
- SAC.....Study Advisory Committee--Representatives of agencies who actively participate in the Level B study to provide a citizen advisory group.
- SCS.....Soil Conservation Service, U. S. Department of Agriculture
- Standards.....Provide for uniformity and consistency in comparing, measuring and judging beneficial and adverse effects of alternative plans.
- Study Steering Committee.....A group of Federal and State officials involved in river basin planning organized to help meet the need for inter-governmental coordination throughout the planning process.
- USDA.....U. S. Department of Agriculture
- USGS.....U. S. Geological Survey
- WRC.....Water Resources Council, U. S.
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- 208.....Water quality management planning for states and designated areas, under Section 208 of P.L. 92-500.
- 209.....Basinwide water resources planning (Level B), mandated by the 1965 Federal Water Resources Planning Act. Section 209 of P.L. 92-500 requires that these studies be conducted for all major basins for the Nation by January 1, 1980.
- 303(e).....Section 303(e) of the 1972 Water Pollution Control Amendments Act (P.L. 92-500) which requires states to develop water quality standards and plans to achieve them for all navigable waters within their jurisdiction.
- Q7-10.....A minimum consecutive 7-day (average) flow with a 10-year recurrence interval.



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