

PART ONE

A HISTORY OF WATER PLANNING IN MONTANA

STATE AGENCY PLANNING

Although the Montana Water Resources Act of 1967 was the first specific legislation aimed at developing a comprehensive water plan for Montana, several activities previously carried out by state agencies were based on some of the same objectives and accomplished some planning and development.

Initial Planning Efforts

One of the first water planning efforts in Montana was accomplished by the Montana Irrigation Commission, which produced plans for irrigation development by county in the period from 1919 to 1921.

An important factor in supplying background data on water development was the inauguration of the Water Resources Survey under the State Engineer in 1934. Without this survey, the state would have virtually no reliable information concerning Montana's water use on irrigated land and no inventory of water rights for the protection of individuals in the state.

Creation of the State Water Conservation Board in 1934 resulted in extensive planning of individual projects; this effort, too, was irrigation oriented and, as a result of federal agency demands, was aimed toward providing economic relief during the depression of the thirties.

Section 89-105, R.C.M. 1947, enacted in 1933, empowered the State Water Conservation Board "... to make such investigations as may be necessary to plan and carry out a comprehensive state-wide program of water conservation." Through the years the Board accumulated a large amount of background data and experience fundamental to any planning effort. Little was accomplished toward comprehensive water planning unrelated to project development, however, until 1967.

The Montana Water Resources Act of 1967: Legal Authority for the State Water Plan

In passing the Montana Water Resources Act of 1967, the Montana Legislature assigned the duties of the

State Water Conservation Board, Carey Land Act Board, and State Engineer to the Montana Water Resources Board (which later became the Water Resources Division of the DNRC) and mandated preparation of a state water plan. The necessity and policy upon which this action was taken are clearly stated in Section 89-101.2, R.C.M. 1947.

It is hereby declared that:

- (1) The general welfare of the people of Montana, in view of the state's population growth and expanding economy, requires that water resources of the state be put to optimum beneficial use and not wasted.*
- (2) The public policy of the state is to promote the conservation, development and beneficial use of the state's water resources to secure maximum economic and social prosperity for its citizens.*
- (3) The state, in the exercise of its sovereign power, acting through the department of natural resources and conservation shall co-ordinate the development and use of the water resources of the state so as to effect full utilization, conservation and protection of its water resources.*
- (4) The development and utilization of water resources, and the efficient, economic distribution thereof, are vital to the people in order to protect existing uses and to assure adequate future supplies for domestic, industrial, agricultural and other beneficial uses.*
- (5) The water resources of the state must be protected and conserved to assure adequate supplies for public recreational purposes and for the conservation of wildlife and aquatic life.*
- (6) The public interest requires the construction, operation and maintenance of a system of works for the conservation, development, storage, distribution and utilization of water, which construction, operation and maintenance is a single*

object and is in all respects for the welfare and benefit of the people of the state.

(7) It is necessary to co-ordinate local, state and federal water resource development and utilization plans and projects through a single agency of state government, the department of natural resources and conservation.

(8) The greatest economic benefit to the people of Montana can be secured only by the sound co-ordination of development and utilization of water resources with the development and utilization of all other resources of the state.

(9) To achieve these objectives, and to protect the waters of Montana from diversion to other areas of the nation, it is essential that a comprehensive, co-ordinated multiple-use water resource plan be progressively formulated, to be known as the 'state water plan.'

In order to fulfill the intent of the Act as quoted above, the Legislature further spelled out the procedure for development and implementation of the State Water Plan in Section 89-132.1 of the Act:

The department shall:

(1) Gather from any source reliable information relating to Montana's water resources, and prepare therefrom a continuing comprehensive inventory of the water resources of the state. In preparing this inventory, the department may conduct studies, adopt studies made by other competent water resource groups including federal, regional, state or private agencies, perform research or employ other competent agencies to perform research on a contract basis, and hold public hearings in affected areas at which all interested parties shall be given an opportunity to appear.

(2) Formulate and with the approval of the board [of natural resources and conservation], adopt, and from time to time amend, extend or add to, a comprehensive, co-ordinated multiple-use water resources plan, known as the 'state water plan.' The state water plan may be formulated and adopted in sections, these sections corresponding with hydrologic divisions of the state. The state water plan shall set out a progressive program for the conservation, development and utilization of the state's water resources, [and] propose the most effective means by which these water resources may be applied for the benefit of the people, with due consideration of alternative uses and combinations of uses. Before adoption of the state water plan, or any section thereof, the department

shall hold public hearings in the state, or in an area of the state encompassed by a section thereof if adoption of a section is proposed. Notice of the hearing or hearings shall be published for two (2) consecutive weeks in a newspaper of general county circulation in each county encompassed by the proposed plan or section thereof at least thirty (30) days prior to the hearing.

(3) Submit to each general session of the legislature the state water plan or any section thereof or amendments, additions or revisions thereto which the department has formulated and adopted.

(4) Prepare a continuing inventory of the ground-water resources of the state. The ground-water inventory shall be included in the comprehensive water resources inventory described in subsection (1) above, but shall be a separate component thereof.

(5) Publish the comprehensive inventory, the state water plan, the ground-water inventory, or any part of each, and the department may assess and collect a reasonable charge for these publications.

(6) The board may adopt rules necessary to effect the purposes of this act.

Thus, Section 89-132.1 relates the scope and objectives of the State Water Plan; as originally passed by the legislature, the Act designated the Montana Water Resources Board as the state agency responsible for the development of the plan. Early in 1968, the Board organized a planning staff which reviewed the mandate of the Montana Water Resources Act and decided that the State Water Plan should be developed in four phases (discussed below under "Planning Procedure"). The first phase, the inventory, was begun.

The Water Resources Division: 1971 to 1976

In 1971, the Montana Water Resources Board became the Water Resources Division of the Montana Department of Natural Resources and Conservation. Originally, two Bureaus were created within the Water Resources Division: the Engineering Bureau and the Resources and Planning Bureau. Passage in 1973 of the Montana Water Use Act and of amendments to the Floodway Management and Regulation Act resulted in creation that year of the Water Rights Bureau and the Floodway Management Bureau. The Water Development Bureau was established in 1975 as a result of the passage of the Renewable Resource Development Act.

The Resources and Planning Bureau has had the primary responsibility for development of the state

water planning program since 1971. In 1972, river basin planning began in the Columbia River Drainage with study of the Flathead River Basin (in cooperation with the Pacific Northwest River Basins Commission) and of the Clark Fork River Basin (in cooperation with the agencies of the U.S. Department of Agriculture). In 1975, river basin planning began in earnest in the Yellowstone River Basin. The major planning effort at this time is directed toward the study of individual river basins for the purpose of presenting specific alternatives and making needed recommendations in water and related land resource management for specific areas of the state.

In addition, numerous studies have been completed or are underway which will add to the water plan as it is formulated; a number of these are listed in Table 1. In view of the increasing number of studies, the need for coordination by the state of state-wide planning activities and for coordinated input into regional planning efforts (as called for in the Montana Water Resources Act of 1967) becomes apparent. In addition, it is important that much of Montana's water planning would not have been accomplished without the efforts of federal agencies and the availability of federal money.

FEDERAL AND REGIONAL PLANNING

Under the authority of the Federal Flood Control Act of 1944, regional planning by federal agencies, chiefly the U.S. Bureau of Reclamation and the U.S. Army Corps of Engineers, was initiated. The Missouri Basin Inter-Agency Committee was formed in 1945 and in 1969 released **The Missouri River Basin Comprehensive Framework Study**, which included the Missouri from its headwaters in Montana to the mouth of the river at St. Louis, Missouri. The Committee was dissolved in 1971 following creation of the Missouri River Basin Commission to carry on reconnaissance level studies in the basin. The **Columbia-North Pacific Region Comprehensive Framework Study** was prepared under the supervision of the Pacific Northwest River Basins Commission for all or parts of Washington, Oregon, Idaho, Wyoming, and western Montana. The commission is carrying out further reconnaissance level studies in the basin also. Other studies involving regional aspects of planning were made to support the Columbia River Water Treaty on the Kootenai River, ratified in 1964. The Columbia Interstate Compact Commission, active from 1950 to 1967 and consisting of representatives from several of the western states, made an attempt to promote the equitable division and apportionment of Columbia River Basin water but failed in its effort to ratify a compact between the states involved (Doerksen 1972).

The Western United States Water Plan was prepared under the direction of the Bureau of Reclamation as authorized by the Colorado River Basins Project Act of 1968. "Westwide," as this effort was commonly known, was to present the projected water needs of the entire area of the eleven western states to Congress for its consideration and use in studying future national water problems. This act also established a moratorium on diversions into or out of the Colorado River Basin, until 1978. Westwide experienced a reduction in funding in 1973; the resulting study findings were published in 1975 (U.S. Dept. of the Interior 1975).

In addition to these major regional planning efforts, many smaller area studies have been made which provide important data to the State Water Plan. State Water Plan data, in turn, will provide input into other federal and state resource planning, increasing the possibility that Montana's preferences are included in those efforts. Ongoing and recent federal water planning efforts in Montana are summarized in Table 1 on page 8, in which the following abbreviations are used:

FEDERAL AGENCIES

BOR — Bureau of Outdoor Recreation (USDI)
BR — Bureau of Reclamation (USDI)
EPA — Environmental Protection Agency
ERDA—Energy Research
and Development Administration.
FS—Forest Service (USDA)
GS — Geological Survey (USDI)
SCS — Soil Conservation Service (USDA)
USDA — U. S. Department of Agriculture
USDI — U. S. Department of the Interior

STATE AGENCIES:

BMG — Montana Bureau of Mines and Geology
DFG — Montana Department of Fish and Game
DHES — Montana Department of Health
and Environmental Sciences
DNRC — Montana Department of Natural Resources
and Conservation
DSL — Montana Department of State Lands
MEAC — Montana Energy Advisory Council
MSU — Montana State University

REGIONAL AND LOCAL BODIES

APO — Area-wide Planning Organization
MRBC — Missouri River Basin Commission
OWRC — Old West Regional Commission
PNRBC — Pacific Northwest River Basins Commission

TABLE 1
WATER PLANNING STUDIES IN MONTANA: ONGOING OR
COMPLETED SINCE 1971

Study	Area of Study	Lead Agency*	Time of Completion	Study Objectives, Subject of Study
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COLUMBIA RIVER BASIN

FEDERAL:

Flathead Wild and Scenic River Study	North Fork from the Canadian Border to its confluence with the Middle Fork; Middle Fork from its headwaters to its confluence with the South Fork; South Fork from its origin to Hungry Horse Reservoir.	FS	7/73	Define recreation potential for each river section and recommend congressional action.
Clark Fork of Columbia Type IV Study**	Western Montana	USDA, DNRC	FY 77	Identify water and related land resource problems and investigate their solution using existing USDA or state programs.
Bitter Root RC&D Project	Ravalli, Missoula, Mineral Counties	SCS, Bitter Root RC&D Council	Ongoing	Develop economic development plan for conservation and use of area resources.

STATE:

Flathead Level B Study**	Flathead River Basin	DNRC, PNRBC	Early 76	Develop alternatives for land and water resource use.
North Fork Flathead Cabin Creek Development Study	North Fork Flathead Basin	DNRC	1/77	Study effects of Cabin Creek development in Canada on the North Fork of Flathead.
Flathead Drainage 208 Project	Flathead and Lake Counties	Flathead Drainage 208 Project Board	FY 77	Identify water quality problems and recommend solutions.

MISSOURI RIVER BASIN

FEDERAL:

Missouri Wild and Scenic River Study	Missouri mainstem from Ft. Benton to Rocky Point	BOR	1/75	Study value of Missouri River preservation in free-flowing state.
Headwaters RC&D Project**	Beaverhead, Deer Lodge, Granite, Jefferson, Madison, Powell, & Silver Bow Counties	SCS, Headwaters RC&D Council	Ongoing	Develop economic development plan for conservation and use of area's resources.

STATE:

Milk River Water Management Study	Milk River Drainage	DNRC, BR	FY 76	Investigate water augmentation proposals.
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Table 1 continued

Study	Area of Study	Lead Agency*	Time of Completion	Study Objectives/ Subject of Study
YELLOWSTONE RIVER BASIN				
FEDERAL:				
Montana-Wyoming Aqueducts Study**	Southeastern MT, North-eastern WY	BR	4/72	Investigate water resource availability for coal development.
Yellowstone Wild & Scenic River Study**	Yellowstone mainstem from Gardiner to Pompey's Pillar	BOR	2/75	Study impact of proposed Billings Water Supply unit on Yellowstone River.
Wind, Bighorn, Clarks Fork Type IV Study**	Stillwater, Clarks Fork, and Bighorn River Basins	USDA, DNRC	12/74	Identify water and related land resource problems and investigate their solution using existing USDA or state programs.
Yellowstone Level B Study	Yellowstone River Basin	MRBC, DNRC	10/77	Recommend near-term resource management plan compatible with long-term goals of nation, region, and state.
Powder River Basin Energy Study	Powder River Basin	ERDA	FY 80	Identify alternative futures; economic and environmental evaluations.
Beartooth RC&D Project	Carbon and Stillwater Counties	SCS, Beartooth RC&D Council	Ongoing	Develop economic development plan for conservation and use of area's resources.
STATE:				
Powder River Project Development Study	Powder River Basin	DNRC	Early 77	Evaluate water resource development and storage potential on the Powder River.
Tongue River Project Development Study	Tongue River Basin	DNRC	Late 76	Evaluate water resource development and storage potential on the Tongue River.
Yellowstone River State Water Plan Study	Yellowstone River Basin	DNRC	FY 77	Identify alternative futures; economic and environmental evaluations.
Old West Regional Commission Impacts on the Yellowstone River Study	Yellowstone River Basin	DNRC (funded by OWRC)	FY 77	Investigate possible impacts of large water withdrawals.
Blue Ribbons of the Big Sky 208 Study	Gallatin County, Madison River	DHES, APO	FY 77	Identify water quality problems and recommend solutions.
Middle Yellowstone 208 Study	5 counties along the Middle Yellowstone	DHES, APO	FY 77	Identify water quality problems and recommend solutions.
Lower Yellowstone-Tongue 208 Study	6 counties along the Lower Yellowstone & Tongue	DHES, APO	FY 77	Identify water quality problems and recommend solutions.

Table 1 continued

Study	Area of Study	Lead Agency*	Time of Completion	Study Objective, Subject of Study
STATE-WIDE, REGIONAL, AND INTERNATIONAL				
INTERNATIONAL:				
Poplar River Water Allocation Study	Poplar River Basin in Canada and USA	Poplar River Task Force, DHES, DNRC, etc.	FY 76	Divide water resources between U.S. and Canada.
Missouri River Basin Commission Comprehensive Coordinated Joint Plan	The entire Missouri River Basin in 10 states and Canada	MRBC, DNRC	FY 77	Develop alternatives for water and land resource use in the basin.
FEDERAL:				
North Central Power Study**	North Central & Rocky Mountain areas	USDI	10/71	Investigate feasibility of energy production by mine mouth coal-fired plants and associated LHV transmission.
Westwide Study**	11 states	BR	4/75	Evaluate the critical water problems of the western states.
Northern Great Plains Resource Program**	Northern Great Plains	USDI and others	8/75	Investigate effects of mineral development on the Northern Great Plains.
Section 303e Water Quality Management Plans**	All river basins in Montana	EPA, DHES	FY 76	Establish priorities and action schedules for resource expenditures; implementation studies.
Eastern Montana Basins Study**	26 Eastern Montana counties	BR	FY 76	Identify and evaluate resources for future development.
Western Energy Expansion Study	17 western states	BR	10/76	Survey and identify ways to generate additional electrical power, including hydropower and alternative sources.
Army Corps of Engineers Umbrella Study	Missouri River mainstem from Sioux City, IA, to Three Forks, MT	Corps of Engineers	FY 77	Formulate solutions to existing problems with reservoir systems; determine need for system modification to meet water needs.
Pacific Northwest River Basins Commission Comprehensive Coordinated Joint Plan	Columbia Basin and Pacific slope drainages in Washington, Oregon, Idaho, Montana, and Wyoming	PNRBC, DNRC	FY 77	Develop alternatives for water and land resource use in the Pacific Northwest.
Five-State Madison Ground-Water Study	The eastern third of Montana plus parts of Wyoming, Nebraska, and North and South Dakota	GS	1981	Investigate the hydrology of the Madison Limestone Formation and its ability to supply large quantities of water.
STATE:				
Water Quality Management Plan	State-wide	DHES, DNRC, DFG	7/76	Evaluate waste-water discharge and sediment.
General Energy Policy and Recommendation Study	State-wide	MEAC	Early 77	Develop an energy policy for Montana.
Saline-Alkali Control Program	Eastern two-thirds of state	DSL, USDA, MSU, BMG	6/77	Examine saline seep situation
Montana Ground-Water Study	Emphasis on Fort Union Coal Area	BMG, GS	6/77	Investigate the hydrology of the Fort Union Formation and strip mining's effects on it.

*See page 7 for explanation of abbreviations.

**These Studies have resulted in publications which are included in the "Selected Bibliography."

METHODOLOGY OF THE STATE WATER PLAN

PLANNING PROCEDURE

Inventory Series Report Number 4, **Water Resources and Planning**, published in 1968, presented the basic scope and outlined the assumptions and study procedure to be tentatively followed in conducting a state water planning program. However, many changes have occurred since then which necessitate the redefinition of the objectives, procedures, and guidelines to be included in the general planning methodology. In 1968, the terms "environment," "ecology," "multiobjective planning," and "quality of life" were seldom mentioned in everyday planning activities. The emphasis was on economic development, conservation, and utilization of our resources, with planning centered around the ultimate use of the water resource. Today, most of the objectives, procedures, and guidelines which were set up for water and related land resource planning in 1967 and 1968 still pertain, but there are new ideas, new considerations, new people conducting planning programs, and more people demanding the information being produced in comprehensive studies such as those Montana is conducting. Because of this change in planning approach and because of the current emphasis on public involvement in the planning process, a redefinition of the State Water Plan methodology is in order.

The four phases of the State Water Plan outlined by the Montana Water Resources Board in 1968 are given below, modified to reflect changes in the planning approach.

Phase One: The Inventory

The first phase of the State Water Plan is the resource inventory, which is the accumulation of detailed knowledge of the water and related land resources of the state of Montana and their present management and use. The inventory phase of the water plan has resulted in the publication of a number of inventory series reports containing the mass of information acquired during the study. The following have been printed:

No. 1. *Directory of State of Montana, Federal Agencies and Private Groups Active in the General Field of Water Resources* (1968 and 1971).

No. 2. *Water Resources Programs Conducted by Government Agencies in Montana* (1969).

No. 3. *Montana Register of Dams*, a compilation of information on storage reservoirs having a capacity of 50 acre-feet or more (1968).

No. 4. *Water Resources and Planning*, an explanation of the State Water Plan, its authorization, scope, and objectives (1968).

No. 5. *Montana's Water Laws: A Resume'* (1968).

No. 6. *Catalogue of Stream Gaging Stations in Montana*, a collection of historical stream discharge records to 1970 (1968 and 1972).

No. 9. *Summary of Potential Projects in Montana*, a compilation of information on possible future developments of water storage and control projects (1969).

No. 10. *Bibliography of Montana Water Resources and Related Publications* (1969).

No. 11. *An Atlas of Water Resources by Hydrologic Basin*, a 15-map atlas of Montana's drainage basins and resources (1970).

No. 12. *Montana's State Water Plan, A Progress Report*, a report to Montana's 42nd Legislature (1970).

No. 13. *Water Use in Montana* (1975).

No. 16. *A Groundwater Report of Montana* (1969).

Information is currently being gathered for publication of several additional inventory series reports. These include:

No. 7. *Economic Aspects of Water Use*.

No. 8. *Patterns of Management and Administration*, a review of past trends in water and related land use which affect Montana's resources and their development.

No. 14. *An Inventory of Related Land Resources.*

No. 15. *A History of Water Development in Montana.*

Also involved in this phase is the computerization of much of the published (and unpublished) data, allowing easy and rapid use of the water and related land resource information for subsequent phases of water planning.

The inventory reports will continue to be published and updated as new and better information is gathered, as the need for specific information arises, and as the expertise becomes available to do necessary studies.

Phase Two: Requirements and Projections

The second phase of the plan involves the development of water requirements and projections for future water and related resource use from a study of the information regarding present water use obtained in phase one. (These general water requirements and projections are presented on a state-wide basis in **The Framework Report, Volume Two.**)

More detailed regional requirements and projections will be established for use in subsequent river basin planning. To aid in development of these requirements, detailed economic projections are being prepared by the state of Montana for use in planning for Montana's growth while reflecting Montana's outlook for the future.

Phase Three: Plan Formulation

Phase three involves the development and publication of alternative plans, programs, and projects to be implemented in each of three time periods: between the present and 1980, between 1980 and 2000, and between 2000 and 2020. Development selected will be determined by the findings of the inventory and water-needs phases of the water plan, as well as from the findings of other region-, state-, basin-, and county-wide planning efforts. Public and agency comment will be used in determining the final water plan recommended for adoption.

Phase Four: Implementation

The fourth phase of the State Water Plan is the implementation of recommended plans, programs, and projects. Some of this implementation will take place concurrently with present planning efforts; much will be the result of future detailed surveys of problem areas.

OBJECTIVES

Until the mid-1960's, water resource planning was largely based on the evaluation of specific projects as related to one or more uses which had an economic value attached to them. Irrigation was the primary benefit of small watershed projects. Power and flood

control provided the impetus for building larger projects; recreation grew to be a recognizable benefit associated with nearly all reservoirs.

With the advent of nationwide water resource planning, more consideration was given to the evaluation of all benefits upon which a value could easily be placed. A limitation still existed, however, because specific federal and state laws restricted the scope of project benefits which could be studied. Likewise, a study of the detrimental effects of potential water development projects was not adequately required, and, when the environmental effects were often adverse, they were seldom anticipated.

Today, with multiobjective planning, it is possible not only to evaluate the monetary and nonmonetary effects of development, but to better evaluate the advantages of nondevelopment as well.

The overall objective of the State Water Plan is still to *set out a progressive program for the conservation, development, and utilization of Montana's water resources for the maximum economic and social prosperity of the people.* However, under the multiobjective planning theory, all programs will be evaluated from the standpoints of economic efficiency, environmental quality, and regional development.

This planning procedure, designed by the U.S. Water Resources Council, was presented to the state and federal agencies for approval as a part of the "Proposed Principles and Standards for Planning Water and Related Land Resources." They were modified and adopted as published in the *Federal Register* of September 10, 1973. These principles provide the basis for federal participation with river basin commissions, states, and others in the preparation, formulation, and evaluation of plans for states, regions, and river basins, and for federally assisted water and land resource programs and projects throughout the United States. Therefore, the use of multiobjective planning in the Montana water planning program provides not only a logical and objective method of developing a program for the maximum economic and social prosperity of our citizens, but it fits into and is required by the federal water planning principles and standards. A broader discussion of the technique is included below under "Statement on the Final Plan" (page 14).

ASSUMPTIONS

In formulating a varied and broad program such as the State Water Plan, it is necessary first to establish some assumptions which are largely based on national or international conditions over which the state has little or no control but which could have appreciable effect upon decisions and recommendations arrived at by the plan. These assumptions are not predictions of what will

happen in the future, nor has any judgment been made as to the desirability of these conditions. The statements simply reflect trends which are likely to continue and which are likely to influence water use decisions, thereby providing state water planners with a frame of reference within which to structure their efforts. It is possible that some of the assumptions will prove to be inaccurate; however, it can be said in their defense (1) that they agree generally with those made by regional planners and by planners in other states, and (2) that, as stated below, comprehensive planning under the State Water Plan is concentrated on the next 10 to 15 years, and these assumptions should be reasonably accurate for at least that period of time.

Eleven tentative assumptions were originally developed for consideration by the planning staff in 1968; these have been modified, reduced in number, and rewritten to reflect changing national and international conditions as follows:

1. There will be no major wars or depressions which will have extreme effects on long-run economic growth.
2. Certain governmental and private organizations will follow policies designed to stimulate economic growth in the state.
3. Water development in Montana will be for multiple purposes whenever possible.
4. The utilization of water and the treatment of return flows will conform to the water quality standards set by the Montana Department of Health and Environmental Sciences and the Environmental Protection Agency.
5. Unemployment of the civilian labor force will tend to be higher at the state level than at the national level.
6. Montana's agricultural products will supply at least the same share of national requirements in the future that they have in the past.
7. Irrigation efficiency is a function of economics and as such is likely to increase.
8. Efforts will be made to meet power needs of the future.
9. Agricultural, commercial, and industrial productivity will increase, partially as a result of greater efficiencies achieved through evolving technologies.

Certain other considerations have also been recognized. Among these are the following:

1. Planning can best be accomplished by concentrating on comprehensive planning for the near future, i.e., the next 10 to 15 years, and projecting needs for the years 2000 and 2020.
2. In a state where flood flows make up more than 50 per cent of total stream run-off (Montana Water Resources Board 1968), streamflow augmentation through development of surface water storage projects will be a primary consideration to provide for the use of the greatest quantity of water for all purposes.
3. Because the second greatest supply of usable water is in alluvial (ground-water) basins closely associated with principal surface water sources, ground water will be studied in conjunction with surface water in order to modulate and augment flows, especially during drought periods.

GUIDELINES

The Water Resources Division, in order to formulate a State Water Plan, has set guidelines to determine the nature of the investigations to be accomplished. These guidelines will, to a large extent, influence the outcome of the study. They reflect important public policy and, by directing planners, eliminate wasting time in unacceptable planning efforts. For these reasons, it is important that the guidelines be understood and accepted by everyone involved with the study.

1. The State Water Plan will serve the general welfare of the people by striving toward a balance of economic efficiency (considering such factors as marketing potential and national production allocations), resource development (at regional levels as well as individual project levels), and environmental quality (the environmental effects of development will be weighed against the benefits of nondevelopment).
2. The plan will describe alternatives formulated to meet the needs of the people for goods, services, and benefits derived from water and related land resources and make recommendations for management of those resources. Available significant information on each alternative will be presented by subbasin and, where applicable, by county.
3. The importance of public needs and desires and the prerequisite of overall public involvement throughout the entire planning process will be fully recognized; public response to each management alternative will be evaluated.
4. The plan will give priority to (a) in-basin use of water resources (that is, water needs within the basin will be met to a reasonable degree before water transfers

- to other basins are considered, even though inter-basin transfer of water now exists in Montana and will continue to offer a reasonable means of water and related land development), and (b) Montanans' interests in water use (even though federal and regional interests will also be recognized).
5. The plan will consider the flexibility of state and federal laws, policies, and institutional relationships governing both short- and long-range water planning and development, and changes will be recommended in those laws, policies, and relationships if necessary to allow the development of selected alternatives.
 6. The plan will be formulated utilizing only those waters rightly available for Montana's uses. Full consideration will be given to all interstate agreements and existing water rights within Montana.
 7. Other planning efforts will be evaluated to determine the full impact of other alternatives for uses of Montana's water and related land resources.
 8. Due to anticipated rapid changes in social, economic, environmental, technological, and physical factors, both this framework study and the basin planning efforts will be formulated so as to provide a flexible guide for water and related land resource planning in Montana now and well into the future. The general schemes of water use will be capable of serving needs which may vary widely in magnitude from those anticipated or being considered at the present time; in addition, those portions of the plan which are not implemented or which otherwise become out-of-date will be reviewed and revised to meet the water planning objectives.

STATEMENT ON THE FINAL PLAN

RIVER BASIN STUDIES

Early in the planning process it was decided to divide the state into river basin planning units to facilitate study of the resources and their relationships. These units fall into three categories according to size. The major basins in the state are the drainages of the Clark Fork of the Columbia, the Missouri, and the Yellowstone Rivers, which are further divided into submajor and minor drainage basins as shown on the map on the opposite page. These submajor and minor drainage basins have provided the basis for the major portion of data gathering for the State Water Plan.

Concurrently with the completion of **The Framework Report**, reconnaissance-level evaluations of the water and related land resources of these basins will be made. Each of the three major basins will be considered a planning area. This approach, which can be called the watershed planning approach, must be flexible and allow for the study of larger or smaller problem areas as the need arises.

The smaller river basin studies will be prepared in an attempt to resolve the short-range problems identified by the framework study and to identify foreseeable long-range problems, develop solutions to them, and make recommendations for solving these problems. Studies are presently nearing completion for the Flathead River Basin in western Montana and for the Yellowstone River Basin in eastern Montana.

PRESENTATION OF DATA

One of the major problems encountered in water resources planning has been the failure of planning agencies to present data to the public in a usable form. In planning for water utilization, for example, the logical method is the delineation of river basins and the gathering of data accordingly. Unfortunately, that method ignores the political subdivisions used for nearly every other type of data manipulation.

The State Water Plan will attempt to overcome this problem by presenting as much data as possible on both the county and the river-basin levels. It is hoped that the presentation of information in this manner will aid city and county officials. Planning figures will not require as much time to group for a county such as Carter, which contains two submajor and seven minor basins, or to separate for a county such as Wheatland, which lies entirely within one minor basin. This method of data presentation will also stress the importance of river basin planning as related to county-wide planning, and vice versa; also, the people responsible for the implementation of alternative recommendations, other decision makers, and interested groups will all share a common information base.

THE PLANNING PROCESS FOR EACH BASIN

The following planning steps (which have been related to the four phases of the State Water Plan as outlined on pages 11 and 12) will be performed for each basin

MAJOR, SUBMAJOR & MINOR DRAINAGE BASINS

COLUMBIA RIVER BASIN

KOOTENAI

- 76B Yaak River
- 76C Fisher River
- 76D Kootenai River

FLATHEAD

- 76I Middle Fork Flathead River
- 76J South Fork Flathead River
- 76K Swan River
- 76L Flathead River below Flathead Lake
- 76LJ Flathead River to and including Flathead Lake

UPPER CLARK FORK

- 76E Rock Creek
- 76F Blackfoot River
- 76G Clark Fork above Blackfoot River
- 76GJ Flint Creek
- 76H Bitterroot River

LOWER CLARK FORK

- 76M Clark Fork between Blackfoot River and Flathead River
- 76N Clark Fork below Flathead River

MISSOURI RIVER BASIN (AND ST. MARY DRAINAGE)

UPPER MISSOURI TRIBUTARIES

- 41A Red Rock River
- 41B Beaverhead River
- 41C Ruby River
- 41D Big Hole River
- 41E Boulder River
- 41F Madison River
- 41G Jefferson River
- 41H Gallatin River

MISSOURI-SMITH

- 41I Missouri River above Holter Dam
- 41J Smith River
- 41QJ Missouri River from Holter Dam to the Sun River
- 41U Dearborn River

MISSOURI-SUN-MARIAS

- 41K Sun River
- 41L Cut Bank Creek
- 41M Two Medicine River
- 41N Willow Creek
- 41O Teton River
- 41P Marias River
- 41Q Missouri River from Sun River to Marias River

MISSOURI-MUSSELSHELL

- 40A Musselshell River above Roundup
- 40B Flatwillow Creek including Box Elder Creek
- 40C Musselshell River below Roundup
- 41R Arrow Creek
- 41S Judith River
- 41T Missouri River from Marias River to and including Bullwhacker Creek
- 40EJ Missouri River between Bullwhacker Creek and Musselshell River

MILK

- 40F Milk River above Fresno Reservoir
 - 40G Sage Creek
 - 40H Big Sandy Creek
 - 40I Peoples Creek
 - 40J Milk River between Fresno Reservoir and Whitewater Creek
 - 40K Whitewater Creek
 - 40L Frenchman Creek
 - 40M Beaver Creek
 - 40N Rock Creek
 - 40O Milk River below Whitewater Creek including Porcupine Creek
- ### MISSOURI-FORT PECK
- 40D Dry Creek
 - 40E Missouri River between Musselshell River and Fort Peck Dam
 - 40P Redwater River
 - 40Q Poplar River
 - 40R Big Muddy Creek
 - 40S Missouri River below Fort Peck Dam
 - 40T St. Mary River

YELLOWSTONE RIVER BASIN (AND LITTLE MISSOURI DRAINAGE)

UPPER YELLOWSTONE

- 43A Shields River
- 43B Yellowstone River above and including Bridger Creek
- 43BJ Boulder River
- 43BV Sweet Grass Creek
- 43C Stillwater River
- 43D Clarks Fork Yellowstone River
- 43QJ Yellowstone River from Bridger Creek to the Clarks Fork Yellowstone

MIDDLE YELLOWSTONE

- 43E Pryor Creek
- 43N Shoshone River
- 43O Little Bighorn River
- 43P Bighorn River below Greybull River
- 43Q Yellowstone River between Clarks Fork Yellowstone and Bighorn River

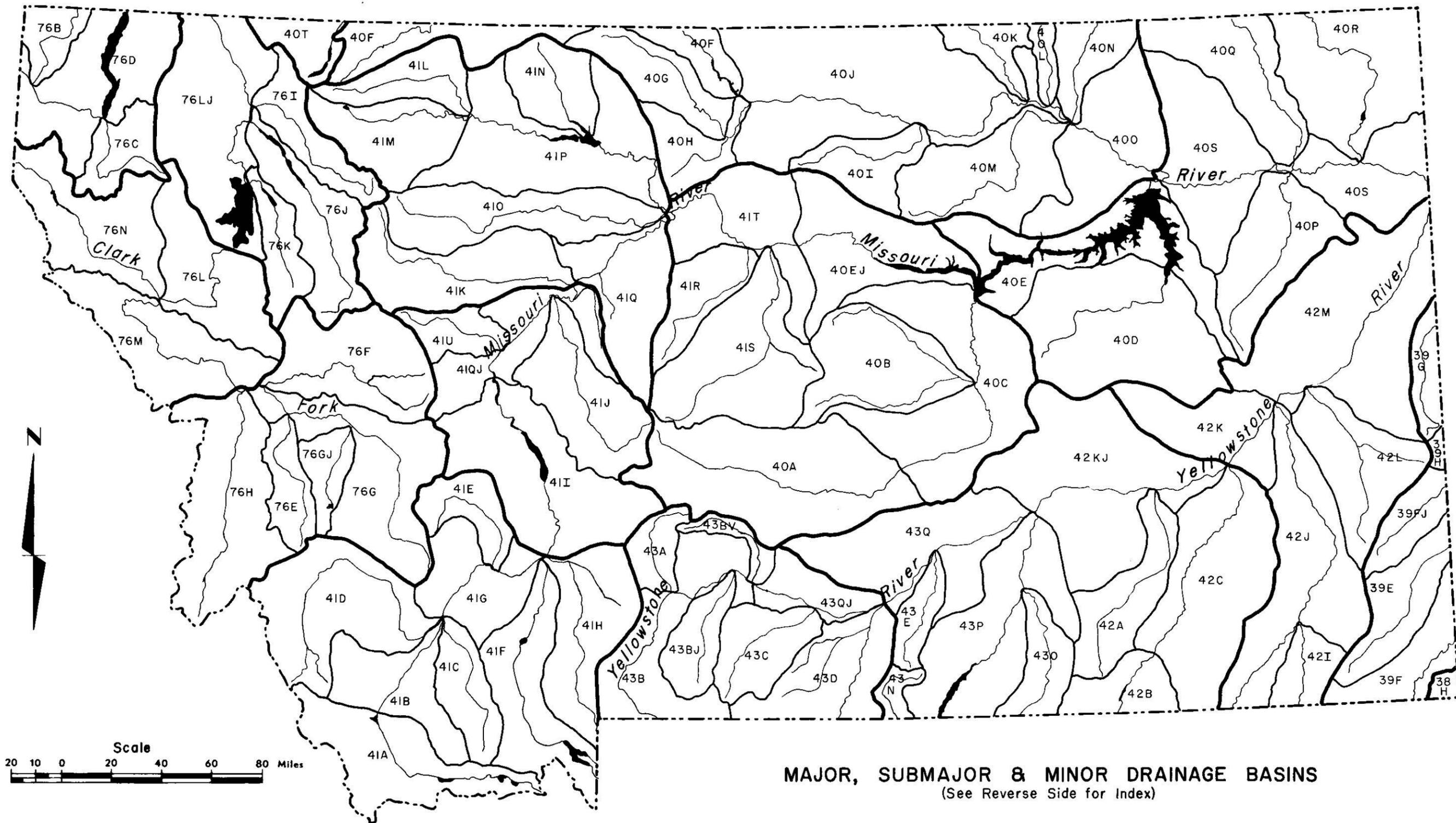
LOWER YELLOWSTONE

- 42A Rosebud Creek
 - 42B Tongue River above and including Hanging Woman Creek
 - 42C Tongue River below Hanging Woman Creek
 - 42KJ Yellowstone River between Bighorn River and Tongue River
- ### LOWER YELLOWSTONE
- 41I Little Powder River
 - 42J Powder River below Clear Creek
 - 42K Yellowstone River between Tongue and Powder Rivers
 - 42L O'Fallon Creek
 - 42M Yellowstone River below Powder River

LITTLE MISSOURI

- 39E Boxelder Creek
- 39F Little Missouri River above Little Beaver Creek
- 39FJ Little Beaver Creek
- 39G Beaver Creek
- 39H Little Missouri below Little Beaver Creek

- 38H Belle Fourche River above Cheyenne River



1. Gather all pertinent data relevant to the study area (phase one: inventory).

This will include compilation of data from all reliable sources, and, where informational gaps exist, appropriate methods and techniques will be used for estimation. Once the information has been compiled, it will be correlated with information gathered for other basins.

2. Specify the components that are relevant to the planning area (phase two: requirements and projections).

From the outset, the Water Resources Division will consult federal, regional, state, and local groups to identify the particular needs and problems that are significantly related to the use and management of the resources in each planning area. The types of goods, services, developments, and environmental conditions desired will be defined so that meaningful alternative levels of growth can be identified.

3. Formulate alternative plans to reach differing levels of development for both the study area and the entire state (phase three: plan formulation).

Based upon identified needs and problems, alternative plans will be prepared and evaluated with respect to their contribution to the objectives of the State Water Plan. The effects of the alternative plans will be considered on both the basin- and state-wide levels.

4. Review the objectives and analyze the differences between the alternatives (phase three: plan formulation).

A summary of anticipated beneficial and adverse effects for each alternative will be prepared in graphic form so that the differences can be clearly shown and analyzed. This analysis will enable the planning team and others to compare all anticipated effects of all alternatives.

5. Select a plan based upon an evaluation of the trade-offs among the various alternatives (phase three: plan formulation).

From the analysis of alternatives, the Water Resources Division will select a plan. Other plans representing differing priorities among the objectives will also be included in the report, as will detailed analyses of the trade-offs involved and the basis for choosing the selected alternative.

6. Distribute the report for review (phase three: plan formulation).

As each river or subbasin study is completed (according to a priority system based upon the demand for the resource and the need for management), it will be published and distributed to government agencies and to the public. The needed public education and input will be obtained through a comment period and a public hearing held within the area encompassed by the selected and alternative plans.

7. Present a recommended plan for adoption (phase four: implementation).

Following the review (and possible subsequent modification of the report), the Department of Natural Resources and Conservation will recommend a final basin plan to the Board of Natural Resources and Conservation. Adoption of a plan by the Board can be considered the initial implementation step, although complete implementation can result only from active participation over an extended period of time by all parties concerned, including both public officials and private citizens, and probably will require enactment of additional legislation.

THE STATE WATER PLAN

Taken together, the publications will make up the State Water Plan. Publication of a report summarizing the basin studies is also anticipated. It is likely that frequent updating of State Water Plan publications and the publication of progress reports will be necessary to keep all involved in the decision-making process aware of changes in Montana's water resources situation.