PART V

DEVELOPMENT OF COMPREHENSIVE PLAN

CHAPTER 19

Framework Plan and Recommendations

19.1 INTRODUCTION

The purpose of this chapter is to describe the comprehensive framework plan for the development and management of the water resources in the Okanagan. This plan represents an integration of the best alternatives described and evaluated in the proceeding chapters for managing water quantity, water quality, shoreline recreation and fishery resources, to provide the future lifestyle preferred by the residents of the Okanagan Basin as expressed through the Public Involvement Program (P.I.P.) Task Forces. These task forces unanimously supported Projection III involving a lower pace of growth, protection of agricultural lands and maintenance of a high quality environment as stated in their primary recommendation (Appendix C) that:

> *"Future planning in the Okanagan should place primary emphasis on environmental protection, giving due emphasis to maintaining the economic viability of the valley."*

19.2 THE PLANNING PROCESS

Consensus on the development of the framework plan was gained incremental1y during the four year planning study. This agreement was achieved through repetition of the sequence of steps comprising the planning process as described in Chapter 12.

1) Establish Objectives
2) Assess resource capability
3) Project future demands
4) Identify alternatives
5) Evaluate alternatives
6) Select Plan

The first step in any planning study is to gain a clear understanding of the nature of the problem. At the start of this study, a number of water management problems had been generally defined, but many required further clarification. First, there was some concern that future water requirements for irrigation, municipal and recreational uses could not be met by the water resources within the basin, and that a large scale water importation might be required at an early date. This concern was based primarily on the assumption that there would be a large increase in the land irrigated which assumption has not been supported by subsequent detailed economic growth projections. Second, it was known that excessive nutrient inputs from human activity in the basin were

contributing to the eutrophication of the main valley lakes and the control mechanisms were not known. Third, there were growing conflicts between water for fisheries and agriculture in some tributary watersheds, but as no means of assessing the potential values of these conflicting uses had been devised, no rational allocation procedures were available.

Solutions to these problems required new approaches to planning, new techniques of evaluation and integration of a wide range of technical information from many different disciplines. Because many of these concepts were untested, the Consultative Board and Study Committee agreed to tackle the planning process incrementally, thereby gradually becoming more familiar with both the nature of the water management problems and more competent at evaluating them in a comprehensive manner.

The major steps in the study prior to the signing of the Canada-British Columbia Okanagan Basin Agreement up to its termination on March 31, 1973 are shown in Figure 19.1.

The first complete run at the planning process involved the evaluation of water quantity management in the Okanagan mainstem system, undertaken during the summer of 1971. As the Okanagan Basin Agreement specified that a comprehensive impact assessment of any large scale diversion from the Shuswap or other watershed would be required, it was necessary - early in the Study - to check the need of such a diversion so that a complete evaluation could be undertaken if this alternative was required to meet the stated water quantity objectives.

For the first time in the Okanagan Study, all the major disciplines were integrated into an evaluation team to complete this preliminary assessment. This comprised of fishery biologists, hydrologists, economists, system engineers, recreation geographers, and wildlife ecologists. Preliminary projections of economic growth and associated water requirements to 2020 were made and a number of alternatives including diversion were assessed. As mentioned in Chapter 14, large scale diversion could not be justified based on these evaluations and so more attention could be focussed on solving other major water management problems in the Okanagan.

The next step in development of a framework plan involved the full evaluation of all water and related resource management alternatives to 1980. The short time horizon was selected for two reasons:

1) Economists argued that projections of economic development and population could only be reasonably accurate to 1980. Thereafter, such projections become little more than educated guesses.

2) A full 'dress rehearsal'of planning and evaluation procedures was

MAJOR PHASES IN THE PLANNING PROCESS - OKANAGAN BASIN STUDY

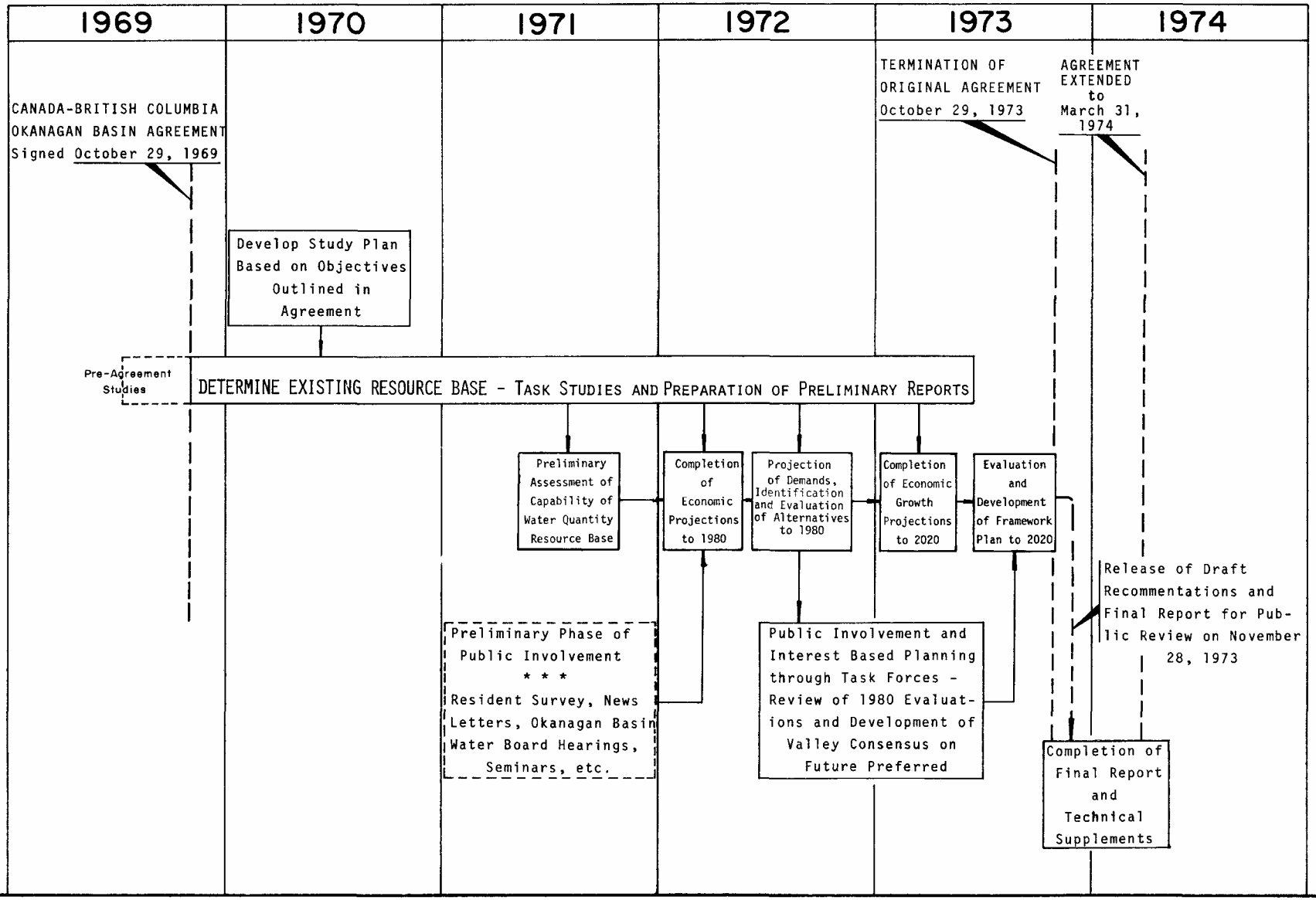

Figure 19.1

desirable before launching into the major step of evaluating a range of economic growth projections to the year 2020.

During the spring and summer of 1972, the evaluation team analysed a number of water resource management alternatives, for the mainstem system and selected tributaries. At the same time, the public involvement program was gaining momentum, educating the community on the scope of water resource problems and receiving comments on public reaction to water management alternatives. Six PIP "task forces", established in the fall of 1972 examined the first draft of the 1980 evaluations on water management during the winter of 1972-73.

At this point in the planning process, the Study personnel and the task forces began to formulate a plan to the year 2020. The task forces took the information on the projections available for 1980 and other data prepared by the Study Committee, to arrive at the type of future development they would like to see in the valley. This philosophy stressed environmental and social goals at the expense, but not neglect of economic growth.

The Study personnel developed three projections of economic growth, as described in Chapter 13, to test the capability of the water and related resource base to satisfy a wide range of resource demands and to provide a more flexible plan for the future. Analysis of these projections indicated that the same basic water management plan was required for all three growth projections.

The PIP task forces favoured Projection III, which emphasizes environmental quality and agricultural development at the expense of a somewhat slower pace of economic growth. The final stage in the planning process involved the integration of the basic principles enunciated by the Task Forces with the technical details of the water resource management alternatives. This important step was undertaken by the evaluation team and Task Force Seven during the spring and summer of 1973. Members of the evaluation team attended a11 Task Force Seven meetings and two seminars were held in June and September T973 to which Study personnel and task force members were invited. In addition, the Consultative Board and Study Committee met with Task Force Seven in July, 1973. As a result of these meeting a general consensus on the make-up of the framework plan to 2020 was obtained.

19.3 THE COMPREHENSIVE FRAMEWORK PLAN

The framework plan maps out a sequence of water and related resource management decisions over the next fifty years, based on the economic growth projections prepared by the Study (Figure 15.2). One of the major findings of this study, however, is that the same basic plan applies to all three growth projections, and that the same mix of water management decisions will be required over the next thirty years at least, whichever economic future the Okanagan pursues.

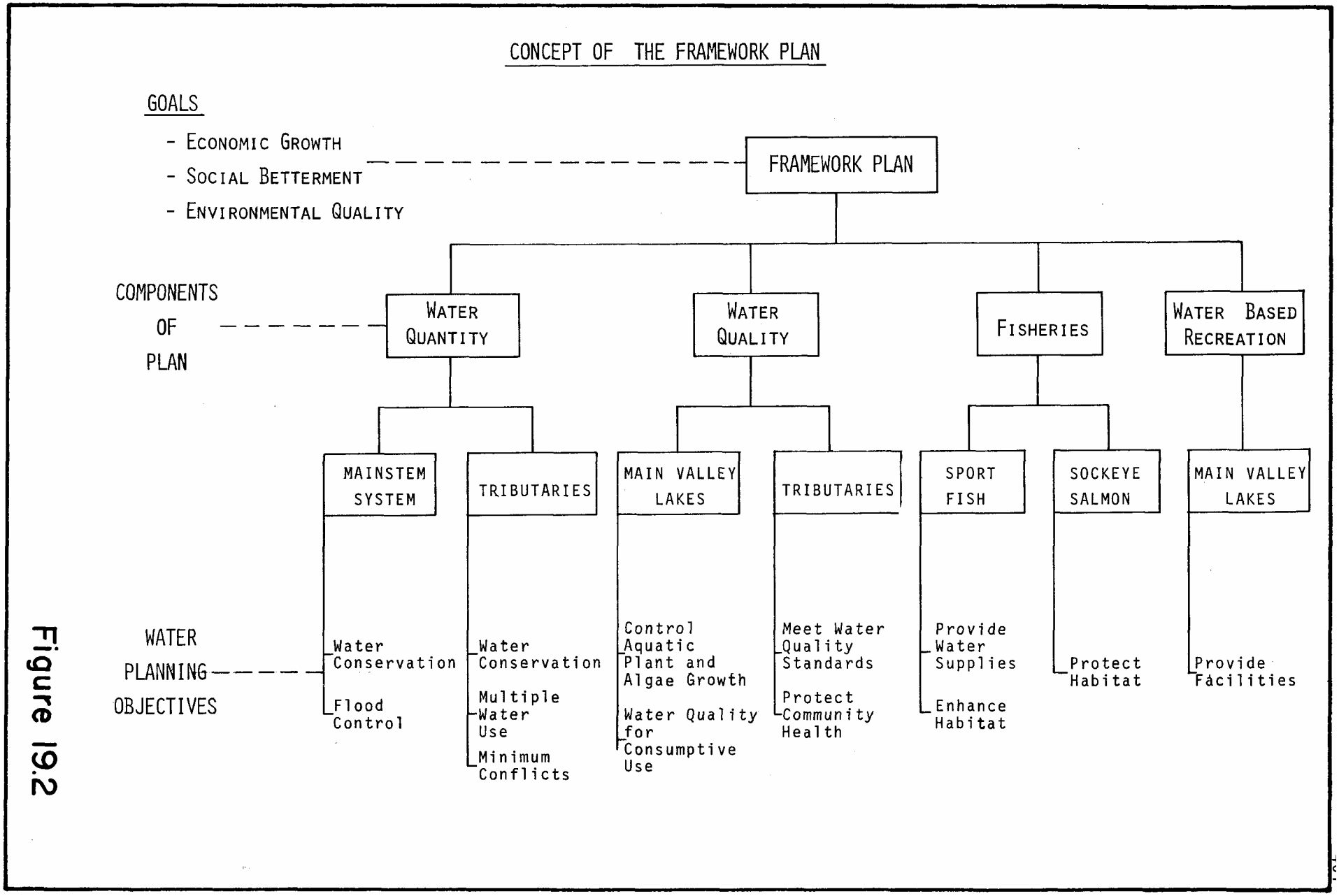
CONCEPT OF THE FRAMEWORK PLAN
GOALS
- Economic Growth
- Social Betterment
- Environmental Quality
FRAMEWORK PLAN
COMPONENTS OF PLAN
WATER QUANTITY
WATER QUALITY
FISHERIES
WATER BASED RECREATION
MAINSTEM SYSTEM
TRIBUTARIES
MAIN VALLEY LAKES
TRIBUTARIES
SPORT FISH
SOCKEYE SALMON
MAIN VALLEY LAKES
WATER PLANNING OBJECTIVES
Water Conservation
Flood Control
Water Conservation
Multiple Water Use
Minimum Conflicts
Control Aquatic Plant and Algae Growth
Water Quality for Consumptive Use
Meet Water Quality Standards
Protect Community Health
Provide Water Supplies
Enhance Habitat
Protect Habitat
Provide Facilities

Figure 19.2

Although the framework plan has been developed to encompass the next fifty years, because of the many uncertainties in the factors controlling the plan, it is probably only reliable for the next ten years or so. After that time, projections of future demands for water and related land resources may vary from those forecast in this report, or the water resource may respond differently to water and waste management measures than as predicted, or indeed, the residents of the valley may place different weights on environmental and social-factors affecting water management. All these uncertainties combine to make it necessary to monitor regularly the response of water and related resources to the set of management measures implemented over the next ten years and to undertake a full review of the entire plan in the year 1980. Appropriate adjustments may then be made so that the plan continues to meet the goals of economic growth and social betterment of valley residents.

One of the major challenges in any planning study is to make recommendations on specific actions when the outcomes of these actions cannot be fully predicted. It is usually too expensive in both time and costs to attempt to remove all the uncertainties associated with planning decisions, and therefore, once a reasonable amount of information is available on the economic, social and environmental consequences of alternatives, decision-makers must act. Consequently there must be no doubt that the framework plan described below should be implemented and then carefully monitored.

As mentioned in Chapter 12, the framework plan represents a mix of water quantity, water quality, sport-fishing and shoreline recreation resource management measures, which together provide a satisfactory balance for meeting the economic, social and environmental goals of the basin community. The plan itself must be firmly established on the social philosophy for future development in the basin as developed by consensus of valley interest group representatives at the task force meetings. Within this basic framework, the components of the plan (namely specific water quantity, waste management and water-based recreation planning alternatives) are designed to meet the set of planning objectives outlined in Chapter 12. It-may be impossible to achieve all of these planning objectives due to inherent resource conflicts, lack of funds and uncertainty in the behaviour of the water resource system in the Okanagan. Consequently, the recommended plan comprises a mix of alternatives which together wilt ensure good water resource management and resolve most of the major conflicts in water use at minimum costs.

In view of the uncertainty surrounding water management measures on the longer term horizon, the plan exhibits one additional characteristic - flexibility. With the likelihood of improved techniques of waste management in the future, the plan only recommends measures required in the immediate future to ensure high water quality in the main lakes. This initial action is strongly recommended however, because the major threat that must be avoided at all

costs is the over-enrichment of Okanagan Lake.

This event would not only be almost irreversible due to the long residence time of water in the lake, but would also create eutrophic conditions in Skaha, Vaseux and Osoyoos Lake, which could not be corrected by existing waste management practices within our lifetime. Other than this feature, it appears that the Okanagan has some flexibility in the path selected for water and related resources management, and the framework plan described below represents the optimum approach at the present time.

19.3.1 Socio-Economic Goals of the Valley Community

The valley consensus emphasized as a basic concept that the unique environment in this valley is the key to maintaining the presently desirable life-style. Future planning in the Okanagan must place primary emphasis on environmental protections, though giving due attention to maintaining the economic viability of the basin. Projection III was thus preferred over the other two growth projections, incorporating careful economic planning with population stabilizing around 275,000 to 300,000 by 2020. In addition, there was an appreciation for regional differences in economic opportunity with preference for the main thrust of future growth to remain in the Central Okanagan rather than in the agricultural north and south.

Task Force Seven stated that agriculture, especially the tree fruit industry is an integral component in the Okanagan life-style, and thus favoured the development of agricultural lands consistent with Projection III. Apart from the need to provide food, the development of agriculture was supported because of its aesthetic appeal, and the social value of the small farm to Okanagan residents.

Because of the uncertain economic future of the agricultural industry in the Okanagan, a large expansion of irrigated acreage will require more than the availability of relatively cheap water supplies. Strict controls on landuse to preserve good agricultural lands must continue, together with economic incentives to farmers to remain in production, but these aspects lie outside the terms of reference of the Okanagan Study. However, the Study has indicated that should economic and social conditions conspire to help the agricultural industry, water supplies can be developed to meet projected developments, calling for up to an additional 25% more land than that presently irrigated.

The broad approach to water management in each of the major components of the framework plan described in the following sections has been developed by the Consultative Board based on input from the Study Committee and consultation with the Public Involvement Task Forces. The recommendations prepared by the task forces themselves are summarized in Appendix C of this report.

19.3.2 Water Quantity

The basic water quantity objective of meeting all consumptive and non consumptive water requirements at all times is not feasible because of limited water supplies during prolonged drought periods. However, the frequency of these is such that no large scale importation of water is justified to meet water requirements along the mainstem system, provided that Okanagan Lake can be drawn down below its normal low water elevation, and improved water management is practised. Priorities for water use may also be required, particularly in the tributary sub-basins where storage reserves are limited. Shortages in tributary basins may be expected to occur in the second year of a consecutive drought cycle. When such deficits are forecast, the task forces have recommended that human consumptive needs be given first priority on available supplies, followed immediately by agriculture. Thus, in extreme and prolonged droughts, the Okanagan water resource would be managed so that consumptive uses are met at a11 times if possible, foregoing some fishery requirements in tributary streams and in the Okanagan River as necessary, provided the viability of the sport fishery resource is maintained in the long run. Okanagan Lake would be operated over an increased range (up to 9 feet between extreme drought and flood conditions) assuming appropriate adjustments are made to water intakes to ensure continuous water supplies to all users.

Because the water levels of Osoyoos Lake are controlled by the Zosel dam in the United States under normal or low flow conditions, and by the Similkameen River in the United States under flood conditions, any long term solutions to the problem of fluctuating water levels on this lake must be resolved through the International Joint Commission. The only short term solution that can be implemented in the Canadian portion of Osoyoos Lake to minimize the impact of extreme floods is flood plain zoning.

In tributary basins, it was recognized that there is a need for multiple purpose water management on some creeks where there is demonstrated fishery potential. Thus, the potential of developing increased headwater storages for irrigation and domestic uses should be investigated on all tributaries. On Mission and Equesis Creeks, new storage and operational procedures for releasing existing water from headwater storages, should be examined to meet the multiple needs of fisheries, irrigation and domestic uses.

The detailed recommendations developed by the Board to meet the water quantity objectives of the framework plan are outlined below. The rationale for each of the recommendations has been set out in Chapter 14. (See also Basic Recommendations 1 to 11 at the front of this report).

Normal Operating Conditions Okangan Lake	12.	*"That Okanagan lake be regulated within its normal four foot range (elevation 119.8 to 1123.8 feet) in all but anticipated extreme flood years (net inflows to Okanagan Lake exceeding 500,000 acre-feet), and successive drought years (net inflows less than 200,000 acre-feet per year."*

13. (i) "Okanagan Lake should be drawn down below its normal low water elevation of 1119.8 feet prior to freshet, in an anticipated flood year, by up to one foot."

(ii) "That flood plain zoning be implemented and enforced by a regional water management authority up to 1127.5 feet elevation around Okanagan Lake. Further development on this flood plain should be limited to recreation, parks and agricultural activities (see also Recommendation 5)."

Lake Operation Under Flood Conditions

(iii) "That the gates on Okanagan and Skaha Lakes be improved to avoid icing during the winter and erosion and bank protection works be built around some drop structures and along Okanagan River."

(iv) "That flood plain zoning around Osoyoos Lake be implemented by the Regional authority to 921 feet as soon as possible (see also Recommendation 5)."

(v) "That emergency protection measures and flood warning systems be further developed for Osoyoos Lake as soon as possible by the British Columbia Water Resources Service. These measures should be described in an information booklet and made available to all residents around the lake."

14. (i) "That the level of Okanagan Lake be maintained at as high an elevation as possible during drought years, recognizing that in single drought years, all consumptive and non-consumptive water requirements should be met. Under prolonged drought conditions, the lake level may reach a low of 1116.8 feet."

(ii) "That irrigation and domestic intakes along Okanagan River channel be lowered or altered so that they are fully operative under a base flow of 100 cubic feet per second (c.f.s.) in drought years."

Lake Operation Under Drought Conditions

(iii) "That once the intakes have been lowered or altered, water requirements for sockeye salmon in Okanagan River should be met in all years except consecutive drought years as follows:

	FLOWS MEASURED AT OLIVER HYDROMETRIC STATION
August 1 - September 15	300 - 400 c.f.s.
September 26 - October 31	350 - 550 c.f.s.
November 1 - April 30	275 c.f.s.

In two or more consecutive drought years, these flows may have to be reduced."

(iv) "That all irrigation and domestic intakes around Okanagan Lake be adjusted as required to be operable at a minimum lake elevation of 1116.8 feet."

Structural Requirements RE Lake Levels	15.	"That all future intakes, wharves, boat ramps and other structures around Okanagan Lake be built to operate with a lake elevation range of 1116.8 to 1125.5 feet. Similar structures around Osoyoos Lake must operate with a lake elevation range of 909 to 919 feet with possible revisions resulting from the proposed I.J.C. review."
Kelowna Floating Bridge	16.	"That contingency plans and costs be prepared by the Province of British Columbia for possible adjustments to the Kelowna Floating Bridge, so that the bridge can function within an operating range of 1116.8 to 1125.5 feet on Okanagan Lake."
Tugulnuit Lake	17.	"That the existing improved channel way used to maintain Tugulnuit Lake be supplemented by the addition of a pumping unit."
Monitoring To Improve Inflow Forecasts	18.	"That the stream monitoring program in the tributary streams to Okanagan Lake and the mainstem should be continued to improve inflow forecasts to Okanagan Lake and the major tributaries."
Multiple Water Use in Tributaries	19.	"That multiple purpose water management be practiced in selected tributary basins to meet present and future consumptive and non-consumptive uses."
Pumped Diversion To Vernon Creek	20.	"That the pumped diversion from Okanagan Lake to Vernon Creek be continued."

19.3.3 Water Quality

Maintenance of high water quality standards for consumptive and non-consumptive uses was of critical importance in the framework plan. The primary goal was to retard the process of eutrophication in the main valley lakes. The concept of exporting wastes outside the basin was rejected in favour of development of a comprehensive waste management program to reduce discharges of controllable sources of nutrients to the surface waters. Water quality standards for all main valley lakes have been established, based on their capacities to assimilate nutrients without promoting algal or rooted aquatic plant growth, and annual phosphorus loadings must be within or below these criteria by 1977. No firm recommendations on waste management can be made beyond 1985 until more information on the response of the lakes to immediate reductions in nutrient loadings is available.

With the uncertainty associated with the water quality management component of the framework plan, a complete program of removing all controllable nutrient sources from the surface water may be more expensive than that required to maintain good water quality conditions. Moreover such action may not always be advantageous. Therefore the framework plan recommends an interim approach to water quality management for the main valley lakes in which phosphorus loadings will be reduced within the established criteria in the immediate future, while maintaining a long term flexibility to take advantage of possible improvements in waste management practices and to reduce the uncertainty in water quality management through careful monitoring of the response of the lakes to decreased nutrient loadings.

In addition to high phosphorus and other nutrient concentrations in some main valley lakes, there are also high coliform levels, oxygen deficiencies, turbidity and high concentrations of iron, manganese and phosphorus in some tributary creeks. Because tributaries have very limited capacities to assimilate wastes, the framework plan recommends complete removal of all direct industrial and municipal waste discharges containing pollutants to the creeks by 1980 and strict regulations on drainage from cattle feedlots and other livestock operations near creeks to prevent surface runoff reaching the stream. In addition because of siltation problems in creeks due to erosion, the framework plan recommends that greenbelts of a suitable width be reserved along the entire lengths of creeks where logging or cultivation is practised.

The detailed recommendations developed by the Board to meet the water quality objectives of the framework plan are outlined below.

Municipal & Industrial Discharges To Tributaries	21.	*"That all municipal and industrial waste discharges causing pollution be prevented from entering tributary streams."*
Erosion Management	22.	*"That forest management and agricultural practices be reviewed by the B.C. Forest Service and the B.C. Department of Agriculture, and greenbelts established where necessary to reduce nutrient loadings from erosion."*
Drainage Waters From Livestock Operations	23.	*"That regulations controlling surface drainage from cattle feed lots, and other livestock operations be established and enforced by British Columbia Water Resources Service by 1975."*

Fertilizers and Sprays

24. "That future regulations controlling fertilizers and sprays be reviewed by the B.C. Department of Agriculture based on the impending report of the Royal Commission presently studying the matter."

Wood Lake

25. "That a sewage collection treatment system at the urban center of Winfield, with facilities for 80% phosphorus removal, be installed by 1977."

Kalamalka Lake

26. "That sewage collection for the urban center of Coldstream with a trunk transport line to the treatment plant at Vernon be installed by 1977. This would effect 100% phosphorus removal in serviced areas and reduce local phosphorus loadings to the Kalamalka Beach area."

Okanagan Lake

27. (i) "That the City of Vernon remove all sanitary and industrial wastes causing pollution from Vernon Creek by implementing one of the two wastewater management options detailed below:

OPTION A - Removal of 80% of phosphorus by 1977 with discharge of treated effluent into Vernon Creek.

This option assumes a discharge effluent which is free of pollutants. Should continued monitoring of Vernon Creek indicate this discharge to contain pollutants which affect the quality of the Vernon Creek and the North Arm of Okanagan Lake, an outfall sewer between the Vernon Sewage Treatment Plant and the main body of Okanagan Lake may be required.

OPTION B - Spray irrigation of secondary treated effluent by 1977. This measure would achieve over 90% phosphorus removal."

(ii) "That sewage collection and treatment with 80% phosphorus removal for the urban center of Okanagan Landing be started by 1977 to reduce loadings to the Vernon Arm of the lake. The option of constructing a trunk line to the central plant at Vernon should be investigated."

(iii) "That 80% phosphorus removal from City of Kelowna waste effluents be implemented by 1977 to reduce loadings within acceptable criteria beyond the year 1980 under a low economic

growth rate. The inclusion of Rutland and new areas in the City of Kelowna sewer system should be undertaken immediately. Increased phosphorus removal may be required by the year 2000."

(iv) "That phosphorus removal at Westbank, Armstrong, Naramata, Summerland, Peachland and other urban shoreline developments be implemented as required by the B. C. Water Resources Service to improve water quality in local shoreline areas of Okanagan Lake."

28. *(i) "That 80% phosphorus removal at the City of Penticton Sewage Treatment Plant be achieved and/or maintained."*

Skaha Lake

(ii) "That treatment and phosphorus removal at Okanagan Falls and other urban shoreline developments be implemented as required by the B. C. Water Resources Service to improve local shoreline areas, based on the results of monitoring programs."

29. *(i) "That 80% phosphorus removal at Oliver is required by 1980 to reduce loadings to Osoyoos Lake."*

Osoyoos Lake

(ii) "That 80% phosphorus removal at Osoyoos is required by 1977. Urban areas in Osoyoos adjacent to Osoyoos Lake and serviced by septic tanks should be sewered and included in the Osoyoos waste treatment program by 1980."

Regional Waste Management

30. *"That the Regional District be given the responsibiltiy for the construction, operation, maintenance and financing of all solid waste and sewage treatment plants in the basin, subject to permits issued by the Government of British Columbia."*

Septic Tanks

31. *"That all new septic tank installations be constructed to standards that ensure 80% phosphorus removal where soil conditions are such that special measures are required to control nutrients from this source."*

19.3.4 Water Based Recreation and Fisheries

Water-based recreation and fishing are important contributors to the economic and social life-style of valley residents and tourists. Thus. the framework plan sets out to manage this facet of the water resource system by improving and increasing the quantity and quality of water-based recreation opportunities with primary emphasis on the needs of residents.

The program of waste management outlined above is expected to control aquatic plant and algal growth in the lakes to levels that permit maximum recreational and aesthetic benefits to be attained. To provide adequate land to meet projected resident and visitor beach day demands, it is recommended that all land alienation of public or crown lands with any recreation potential be prohibited. Development of such areas for shoreline recreation should satisfy future demands without the need to expropriate private shoreline properties.

If current angling success rates are to be maintained over the next 50 years, existing stocks of sport fishes will have to be increased three to four times present levels. Consequently, not only must adequate water supplies for fisheries be assured in all but drought years in selected tributaries and in the Okanagan River, but natural and artificial spawning habitats must be protected and enhanced.

The Boards' recommendations on fisheries and water based recreation to meet the objectives of these components of the framework plan are as follows:

Fishery Management	32.	*"That the fishery resource continue to be managed on a valley-wide basis by the British Columbia Department of Recreation and Conservation but a number of alternative means of financing this program should be investigated by this agency in cooperation with the Regional District."*
Trout Stocking	33.	*"That the Rainbow trout stocking program should be increased from 1.7 million fry annually at present (1971) to 2.1 million fry by 1980 using existing hatchery facilities."*
Fish Hatchery	34.	*"That studies be undertaken by the British Columbia Department of Recreation and Conservation by 1975 for locating and designing a new fish hatchery in the Southern Interior of the Province."*
Boating Regulations	35.	*"That federal boating regulations in headwater lakes be extended and enforced by the British Columbia Department of Recreation and Conservation in cooperation with the Regional District."*
Modified Operation of Existing Storage	36.	*(i) "That a modified operation of headwater storage releases on Mission Creek be established by 1975 by the British Columbia Water Resources Service in cooperation with the irrigation districts."*
New Storage Mission Creek		*(ii) "That 3,600 acre-feet of headwater storage on Mission Creek be licenced and developed for fisheries by 1980."*

(iii) That rehabilitation of the streambed spawning habitat on Mission Creek be undertaken after assuredwater supplies are available."

New Storage on Equesis Creek

37. "That an additional 700 acre-feet of storage be made available to support the fishery in Equesis Creek."

Pumped water - Trepanier Creek

38. "That 2200 acre-feet of water be pumped from Okanagan Lake to the lower reaches of Trepanier Creek by 1985."

Incubation Channel

39. "That further consideration should be given to the development of an incubation channel in one of the tributary creeks to South Okanagan Lake."

Shore Spawning

40. "That due consideration be given to shore spawning kokanee when regulating Okanagan Lake water levels over the winter months."

Coordination of Water-Based Recreation Facilities

41. "That the Regional District be responsible for coordinating the various responsible agencies at the Provincial and Municipal levels in the implementation of recommendations involving shoreline recreation management in the framework plan. Specifically, the Regional District should perform the following duties by 1975:

(i) Preparation of detailed shoreline recreation landuse plans for all main valley lakes.

(ii) Collect recreation data such as the number of summer holiday visitors, number of beach days enjoyed by residents and visitors annually, preferences and attitudes of beach users for shoreline landuse management and other pertinent data.

(iii) Manage recreation use conflicts through implementation of boating regulations on main valley and headwater lakes.

(iv) Undertake a full review of water-based recreation management needs as part of the re-assessment of the Okanagan Study in 1980."

Water Quality for Recreation

42. "That water quality objectives for water-based recreation be met at all public and private beaches in all the main valley lakes, based on the following criteria:

(i) Total mean coliform counts not to exceed a most probable number (M.P.N.) of 240 organisms per 100 milliliters, based on a minimum of 10 samples per beach.

(ii) Fecal mean coliform count not to exceed a most probable number (M.P.N.) of 100 organisms per 100 milliliters, based on a minimum of 10 samples per beach

(iii) Dissolved oxygen not be less than 5 parts per million.

(iv) The water be free from floating debris, scum, weeds, oil slicks, and other objectionable material that detract from its quality and appearance."

Protection of Shoreline for Recreation

43. "That further alienation of public or crown owned shorelines with moderate or high capability be prohibited. These areas which will be required to support future recreation demands are illustrated on the landuse plans accompanying the final report"

Public Access

44. "That all existing public access points to the main valley lakes be inspected, maintained and clearly marked. This should be undertaken by 1975, by the responsible agencies at the provincial and local levels of government."

Boat Launching Facilities

45. "That additional boat launching facilities be built near Kelowna and Osoyoos by 1975, and others built as indicated in Table 16.4. All such facilities on Okanagan Lake should be constructed to accommodate a 9-foot lake level fluctuation from 1116.8 to 1125.5 feet, and on Osoyoos Lake a 9-foot fluctuation from 909 to 918 feet."

19.3.5 Management Considerations

The Consultative Board believes that only through careful planning on a valley-wide basis can the present desirable balance between economic growth and high environmental quality be maintained. A rapid growth of population and industrial development is predicted in the near future for all economic policy options and the natural environment can only be protected if this growth is carefully planned throughout the basin. There is also a need for more effective coordination at the regional level of government to ensure that the basic tenets of the comprehensive plan described above are consistently held throughout the basin.

Consequently, the Consultative Board recommends that the boundaries of the present Regional Districts of North Okanagan, Central Okanagan and Okanagan-Similkameen be redrawn to create a single Okanagan Basin Regional District. The letters patent of this new Regional District would make it

responsible for implementing those water resource management functions that are valley-wide in scope, notably waste water treatment, the orderly development of shoreline recreational facilities and flood plain zoning.

Because all parts of the Okanagan are linked by the flowing nature of water, it is important to avoid actions in one part of the basin that may adversely affect the environment or economic viability in another area. This concept particularly applies to the upgrading of waste treatment facilities, where lack of action in one area can seriously affect water quality in another area, even though appropriate waste treatment measures have been implemented by the latter. Furthermore, as benefits of improved lake water quality are valley-wide, it appears to be unequitable to ask individual communities to pay the major costs of waste treatment which benefit the basin as a whole.

It also appears to be the consensus of the majority of the Okanagan Community that a single authority be established to coordinate the implementation of the framework plan. As much use as possible should be made of existing institutions, for neither the public nor the senior governments desire the creation of a new intervening level of government. The success of the task forces during this Study in bringing together people from all parts of the basin verifies that valley-wide consensus on water management problems is possible.

Provincial legislation is available to establish a regional district for the watershed. While the process of setting up such an authority normally provides for the assignment of a number of functions, it is felt that certain characteristics and functions essential to the success of this new body should be identified in the documents establishing it, for example, in the letters patent. These are:

1) That all residents within the watershed are required to share in the burden of costs, or to undertake necessary common actions, that clearly affect the valley as a whole, for example - upgrading of the main lakes.

2) That standards set by governments for such things as water quality be considered as minimum standards for the Basin and may need upgrading to provide a superior quality of the environment in specific areas.

3) That the Regional District should be supported by a technical resource advisory committee representing the resource agencies concerned. The establishment of such a group is now provided for in provincial legislation.

4) That continuing public participation, which has been a principal feature of this study, be imbedded in the future planning process and be built into the institutional arrangements proposed herein.

Because of local concern that a major reorganization of local government is premature and would create very difficult administrative problems, two alternatives to a single regional district for the basin, either of which could achieve the same objectives, are also outlined in the plan. The first of these provides for the inclusion of areas outside of the basin boundaries within the proposed Regional District Boundaries. The second alternative provides for a reconstruction of the Okanagan Basin Water Board with appropriate amendments to its "Letters Patent" to give this Board authority to carry out the basin-wide water resource management functions outlined in this report. The success of this latter alternative would depend upon the willingness of the three Regional Districts involved to delegate the necessary powers to the Water Board to achieve the objectives of the comprehensive plan. In presenting these two alternatives however, it is important to keep in mind the four characteristics listed above.

19.3.6 Implementation

In view of several conflicts in water management, it is important that the major requirements of the comprehensive plan are implemented as quickly as possible. Many components of the plan such as flood plain zoning, shoreline recreation and fishery management measures are clearly the responsibility of the proposed Okanagan Basin Regional District or the Provincial government and should be carried out without delay. Other aspects of the plan, such as adjustments to the Okanagan Flood Control Works, require joint agreement on cost-sharing by the senior levels of government, before they can be implemented. In the case of waste treatment, although implementation responsibility rests with the Regional District, there are provisions for cost-sharing established under existing programs.

To ensure continuity from planning to implementation of those measures that require joint agreement between governments, the Consultative Board recommends that an implementation task force be established on or before March 31, 1974. This task force would consist of Federal, Provincial and local government representatives and would prepare a draft implementation agreement to the senior governments by June 30, 1974. This agreement will contain details of equitable cost-sharing as developed by the senior governments.

Nothing in this recommendation should inhibit ongoing programs presently in progress, and the implementation of recommendations where responsibilities are clear.

19.3.7 Institutional and Legal Considerations

In examining the legal and institutional aspects of water resource management in the Okanagan, it is apparent that certain deficiencies have hindered effective planning and utilization in the past. These weaknesses are summarized below.

1) No single agency has regulatory controls over all pollutants from sanitary waste discharges to the ground of less than 5,000 gallons per day.

2) No one agency is empowered to enforce waste management, flood plain zoning and green belt measures recommended under the framework plan on all Indian Lands in the Okanagan.

3) There is a lag in the enforcement of legislation, regulations and guidelines affecting water resource management.

4) Prior to this study, the public has had no opportunity for participation in the planning process.

The common thread in these weaknesses is the lack of a basin-wide approach to managing water and water related resources at the local level. The Board believes that a regional authority could, with the benefit of direct experience gained over time, solve most of the problems. It could, for example, develop plans for the orderly use or phase-out of septic tanks that have both health hazard and nutrient loading problems; it could work directly with the Indian bands to solve their problems in a harmonious way; it could identify deficiencies in enforcement programs; and, it could be the focal point for continuing public participation. Specific answers to these problems are not proposed here. Indeed, it is the Boards' view that a single regional authority will in time become more capable of providing effective and acceptable solutions. This is the heart of the Boards' conclusions; namely, that the future of the Valley rests primarily in the hands of local residents, with the support and assistance of senior governments.