EAST KING COUNTY

COORDINATED WATER SYSTEM PLAN

VOLUME I

REGIONAL SUPPLEMENT

October, 1989

Prepared By:

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Under the Direction Of:

East King County
Water Utility Coordinating Committee

In Association With:

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October 6, 1989

File #: 4091.2

Mr. Walter Canter, Chairman
East King County Water Utility
Coordinating Committee
14417 SE 169th
Renton, WA 98058

Subject: East King County Coordinated Water System Plan - Review Draft

Dear Mr. Canter:

Economic and Engineering Services, Inc. is pleased to submit the final East King County Coordinated Water System Plan (CWSP) for your consideration. As you are aware, many elements of this Plan were adopted by the Water Utility Coordinating Committee (WUCC) over the 2-year plan development period. These elements have been brought forward, consistent with WUCC approval, and molded into a comprehensive document. Comments submitted during the review period have been addressed. This document is now ready for adoption by the WUCC.

Preparation of the CWSP has been a cooperative effort among King County, the water purveyors, and State agencies. We are impressed by the degree of participation achieved by the WUCC of all interests. This document is truly a product of local involvement and effort.

We wish to recognize the contribution of our associates to this Plan. The firms of Carr/Associates, CH2M-Hill, Pacific Groundwater Group, and ST Engineers, Inc. have provided expertise and assistance in key areas of Plan development.

The Plan is presented in two volumes. This letter transmits Volume I which is the Regional Supplement. Volume II contains pertinent appendices. Volume I is being provided to all WUCC members whereas Volume II will generally be available upon request.

We thank you for the opportunity to assist in the preparation of the CWSP and wish you success in Plan implementation.

Sincerely,

Robert L. Wubbena

Robert L. Wubbena, P.E.
President

RLW:eas:W

CERTIFICATE OF ENGINEER

EAST KING COUNTY

COORDINATED WATER SYSTEM PLAN

1989

The technical material and data contained in this report were prepared under the supervision and direction of the undersigned professional engineers licensed to practice as such.

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ACKNOWLEDGEMENTS

The following individuals served as Chair of the primary committees that functioned throughout the preparation of the Coordinated Water System Plan, or as representatives of the government agencies that participated in the study process.

Don Ellis, Executive Director of the East King County Regional Water Association, served as overall project director.

Walter Canter, Chairman, WUCC

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EAST KING COUNTY
COORDINATED WATER SYSTEM PLAN

TABLE OF CONTENTS

TABLE OF CONTENTS continued

APPENDICES

LIST OF TABLES

LIST OF EXHIBITS

LIST OF EXHIBITS continued

GLOSSARY OF ACRONYMS AND TERMS

The following definitions are applicable to interpretation of the CWSP. Additional definitions may be found in Chapter 248-54 WAC, "Rules and Regulations of the State Board of Health Regarding Public Water Systems," revised February, 1988, Department of Social and Health Services, Water Supply and Waste Section, LD-11, Olympia, WA 98504.

ACRONYMS:

APWA	The American Public Works Association.
AWWA	The American Water Works Association.
BALD	King County Department of Parks, Planning, and Resources/Building and Land Development Division.
ccf	One hundred cubic feet.
cfs	Cubic feet per second.
CIP	Capital Improvement Program
CWSP	Coordinated Water System Plan (Chapter 70.116 RCW).
CWSSA	Critical Water Supply Service Area (Chapter 70.116 RCW and Chapter 248-56 WAC).
DOT/APWA	Combined standards for public works construction practices of the Washington Department of Transportation and the American Public Works Association, 1984 Edition.
DSHS	Department of Social and Health Services, State of Washington. (Note: Effective July 1, 1989, responsibilities for the CWSP transferred from the Department of Social and Health Services to the Department of Health. Approval and implementation of the CWSP contained in this document will be by the Department of Health.)
EKRWA	East King County Regional Water Association.
Ecology	Department of Ecology, State of Washington.
EPA	United States Environmental Protection Agency.
gpcd	Gallons per capita per day.

gpd	Gallons per day.
gpm	Gallons per minute.
GWMP	Ground Water Management Plan.
KCC	King County Code.
MGD	Million gallons per day.
PSCOG	Puget Sound Council of Government.
PP&R	King County Department of Parks, Planning, and Resources.
RCW	Revised Code of Washington.
SKCHD	Seattle-King County Health Department.
SSMA	Satellite System Management Agency. An organization, individual, or other entity which is prequalified, as provided in the CWSP, to render services such as operation, maintenance, development, or management of water systems in King County.
SSMP	Satellite System Management Program. A program established to provide for technical, contract, and other services to meet management needs of satellite systems. (See Satellite System).
SWD	Seattle Water Department.
ULID	Utility Local Improvement District.
USGS	United States Geological Survey.
USRP	Utility Service Review Procedure. An administrative procedure established under local agency jurisdiction to identify the water purveyor best able to serve an area where new public water service is requested. (See Designated Purveyor).
UTRC	King County Utility Technical Review Committee.
WAC	Washington Administrative Code.
WRIA	Water Resource Inventory Area.
WUCC	East King County Water Utilities Coordinating Committee.

TERMS:

Classes of Public Water Systems	Class 1 - A public water system having 100 or more permanent services Class 2 - A public water system having 10 through 99 permanent services. Class 3 - A public water system serving a transitory population of 25 or more on any one day. Class 4 - A public water system which is not a Class 1, 2, or 3 system. (Note: New State regulations were adopted on September 13, 1989, which redefine the classes of water systems. However, in the context of this CWSP, the above definitions apply.)
Designated Purveyor or Designated Utility	A water purveyor (utility) identified to provide water service to a given area. When willing to provide the service in a timely and reasonable manner, the designated purveyor is assigned an exclusive right to provide public water service to the area and is required to include the area within its approved Water System Plan or King County Water Comprehensive Plan.
Expanding Water Systems	Those public water systems installing additions, extensions, changes, or alterations to their existing source, transmission, storage, or distribution facilities which will enable the system to increase in size its existing service area. New individual retail or direct service connections onto an existing distribution system shall not be considered an expansion of the public water system.
Fire Flow	The rate of water delivery needed for the sole purpose of fighting fires. The fire flow volume shall be in addition to the requirements of the water system for domestic demand.
Franchise Area	Non-exclusive area in which a utility is permitted by the County to extend facilities in public rights-of-way. A franchise area is not equivalent to a service area.
Interlocal Agreement	See Service Area Agreement.

Intertie	A physical connection between individual water systems which allows water supply to be transferred in one or both directions. An intertie can be established as a primary source, secondary or peaking supply, or emergency supply. Ordinarily, the use of an intertie is governed by a written agreement or contract between the utilities. A modification to water rights issued by Ecology may also be required.
Land Use Designation	The land use(s) allowed in a geographical area by right or permit, as provided in the King County Comprehensive Plan and Zoning Ordinance.
Level of Service	Operational features, such as pressure, flow, reliability, etc., provided to the customer by the water system.
New Construction	Any addition of supply, transmission, distribution or storage facilities, either in a new water system or an expanding water system, which provides a capability to serve additional dwelling units or other buildings.
Public Water System	Any water supply system intended or used for human consumption or other domestic uses, including source, treatment, storage, transmission, and distribution facilities where water is furnished to any community or group of individuals, or is made available to the public for human consumption or domestic use, but excluding all water supply systems serving one single family residence. Water systems meeting all of the following requirements are not included: 1. Purchase their entire supply of water from another public water system; 2. Do not treat the water (other than softening or corrosion control); and, 3. Do not sell water. Businesses or systems merely storing and distributing water provided by others are exempt unless that system sells water as a separate item or bills separately for the water provided.
Remote System	A water system located within the service area of a designated utility that is detached and is not served by a direct connection from the designated utility.

Satellite System	A water system not served by direct connection to an existing water utility. A satellite system may be located within or outside the service area of a designated purveyor. A satellite system may be owned and/or managed by an approved Satellite System Management Agency.
Service Area	A geographical area assigned to a water purveyor for the purpose of providing both current and future public water service. Boundaries are defined by agreements among adjacent utilities and are recorded on a set of maps on file with BALD and SKCHD. Water service provided within designated service areas must be consistent with local land use plans.
Service Area Agreement	An agreement signed by water utilities which identifies the service area for which the utility has retail water service responsibility.
Service Connection	A physical connection through which water may be delivered to a customer for discretionary use. Unless otherwise indicated, all such connections, whether currently in use or not, shall be considered as a service connection. The service connection defines the limit of the water utility's responsibility for system design and operation unless otherwise provided for in the water utility's condition of service policies. Utility customers such as mobile home parks, planned unit developments, condominiums, apartment buildings, industrial/commercial sites, or other similar complexes are generally considered exterior to the water system. In such cases, the purveyor shall be required to meet design standards for water systems up to the point of service to the customer; and beyond that point, the applicable plumbing and building codes, fire codes, County health regulations, and local ordinances are deemed to be sufficient to protect the public health and to ensure adequate water service. These customers are not themselves considered herein as water purveyors unless specifically designated as such by DSHS.
Water Comprehensive Plans	King County Code 13.24 requires, as a prerequisite for granting right-of-way franchises and construction permits, that a Comprehensive Plan be prepared by utilities providing water service in unincorporated areas of the County. The plans are reviewed by the County Utilities Technical Review Committee (UTRC) prior to submittal to the King County Council for approval.

Water System Plan	A written plan prepared for a particular water system and service area which identifies a schedule of needed improvements, a financial program, and an operations program. A water system which is expanding within a designated service area may be required to include other elements in its plan. Details of Water System Plan requirements can be found in WAC 248-54-065.

SECTION I

SECTION I

SUMMARY

1. INTRODUCTION AND BACKGROUND

The East King County Coordinated Water System Plan (CWSP). The CWSP consists of two parts: the Regional Supplement, which presents an assessment of water supply needs in East King County and a program to meet those needs; and, individual water system plans prepared by the utilities for their designated service area. The individual plans are prepared within established guidelines and must be consistent with the policies and procedures of this Regional Supplement. Those individual water system plans, which have been approved by the County and the Department of Social and Health Services (DSHS), are incorporated herein by reference as Appendix A, and are on file with the County.

The CWSP was developed by Economic and Engineering Services, Inc. (EES) under the direction of the Water Utility Coordinating Committee (WUCC). The WUCC was established in 1986 by the King County Council and included representatives of water purveyors, local governments, and agencies responsible for water supply and public health in King County.

The CWSP meets the requirements of several State laws relating to water resource management and utility planning. The Water Resources Act of 1971, Chapter 90.54 RCW, sets forth the State's fundamentals for water resource management to ensure that the waters of the State will be protected and fully utilized for the greatest benefit to the people of the State. Continuing with the intent of this Act, the Legislature enacted the Public Water System Coordination Act of 1977, Chapter 70.116 RCW. This statute, referred to herein as the "Coordination Act," and the implementing regulations (Chapter 248-56 WAC) established procedures for water utilities in the State to coordinate their planning and construction programs with other water utilities and local government in the same geographic area.

Subsequent to passage of the Water Resources Act of 1971, the Department of Ecology (Ecology) issued "Procedures Relating to the Reservation of Water for Future Public Water Supply" (Chapter 173-590 WAC). These regulations provide for specific resources to be set aside for use by public water systems in a geographical area to meet projected domestic needs for a period of 50 years.

The Public Water Systems Coordination Act or the water rights reservation process may be used separately or in combination by public water systems in the same geographic area. Rules adopted under the reservation procedure,

however, require that a CWSP be approved by DSHS prior to filing a petition for reservation unless the CWSP requirement has been waived by both Ecology and DSHS.

Once reviewed by the County for consistency with land use plans, shoreline master programs, and/or local development policies, and after adoption by DSHS, the CWSP becomes the management and planning framework for water supply development within the Critical Water Supply Service Area (CWSSA) for which the CWSP was developed. The CWSP is reviewed every 5 years and amended, as necessary, to meet changing needs.

2. PRELIMINARY ASSESSMENT AND CRITICAL WATER SUPPLY SERVICE AREA (CWSSA) DECLARATION

As a preface to implementing the Coordination Act, a "Preliminary Assessment" of water supply and fire protection issues was completed for King County in January, 1986, and updated with respect to specific East King County concerns in November, 1986. The Preliminary Assessment identified several issues of concern in King County that may preclude the delivery of a safe, efficient, and reliable water service to the citizens of the County. Those issues include:

- Proliferation of small water systems.
- Possible limitation of the quantity of water available to King County.
- Lack of coordination between adjacent water utilities, resulting in an unorganized regional approach and duplication of facilities.
- Overlaps and conflicts in service areas.
- Lack of County policies linking water system planning to land use plans.
- County land use policies and development approval processes which promote/encourage the establishment of small water systems.

Due to the variety and depth of these problems and concerns, the Preliminary Assessment recommended implementation of the Coordination Act in King County.

Following this recommendation, the King County Council, on December 15, 1985, adopted a declaration that a CWSSA be declared for South King County, Skyway, Vashon, and by later amendments, East King County. This action initiated the procedures of the Coordination Act in each area. A WUCC, a representative committee of Class 1 and 2 water purveyors, was then appointed to oversee CWSP preparation in each area. The WUCC recommended the King

County Council identify CWSSA external boundaries for each area, and that a CWSP with uniform and consistent policies be developed to meet the objectives of the Coordination Act.

3. PROJECT AUTHORIZATION

Responsibility for development of the East King County CWSP has been shared by King County and the East King County Regional Water Association (EKRWA). The EKRWA is a group of water purveyors providing service within the CWSSA which functions under the legal authority of an Interlocal Cooperation Act Agreement. The EKRWA assumed responsibility for obtaining grant funding from DSHS for preparation of the CWSP. EKRWA and King County, through the Parks, Planning, and Resources Department (PP&R), Building and Lands Development Division (BALD), have administered this project and jointly approved the projects Scope of Work prior to grant application.

Preparation of the CWSP for East King County has been undertaken in accordance with a contract between EKRWA and EES, dated November 11, 1987. The policies, procedures, and recommendations presented herein were developed with the cooperation of the King County PP&R, BALD, the Seattle-King County Health Department (SKCHD), water purveyors and other parties represented on the WUCC, the County Council, Ecology, and DSHS.

4. RELATIONSHIP TO OTHER STUDIES

A comprehensive evaluation of water supply and water resources issues in East King County was a goal shared by the EKRWA and King County. The majority of all supplies in East King County fall into two categories: those provided by the City of Seattle Water Department (SWD) from its Cedar and Tolt River developments, and those provided by individual utilities from groundwater or spring sources. Therefore, both entities supported the simultaneous and comprehensive evaluation of both surface and groundwater sources.

The Scope of Work recognized that a number of agencies were conducting independent but related studies. An objective of the CWSP study process was to coordinate these study activities and to utilize information from the related studies to the maximum extent possible. To this end, coordination with the following principal studies took place:

A. Redmond-Bear Creek Ground Water Management Plan (GWMP) - The Department of Ecology is sponsoring a GWMP with King County as the lead agency. Contributors are the City of Redmond, Union Hill Water Association, and NE Sammamish Sewer and Water District. The plan will assess the study area's physical characteristics, aquifer and recharge characteristics, water quality, and aquifer supply and demand. The

GWMP will also identify existing or potential sources of groundwater pollution. Its recommendations will include groundwater subarea management strategies, a plan for inter-agency cooperation, and a schedule for plan adoption.

B. Issaquah Ground Water Management Plan - A similar study is being carried out for the Issaquah Creek Valley. Contributors are the City of Issaquah and Sammamish Plateau Sewer and Water District, with King County as the lead agency.

C. North Fork Snoqualmie River - The City of Bellevue has conducted extensive studies of the feasibility of developing a combination water supply and hydroelectric generation project on the North Fork Snoqualmie River. The water supply component would be designed to meet the long-range water supply needs of the Eastside area.

D. North Fork Tolt River - The SWD is conducting investigations into development of the North Fork Tolt River for water supply. The Scope of Work on the project includes: reservoir siting, hydrographic survey, project economic evaluation, identification of key environmental concerns, maintenance of instream flows, and other management tasks.

E. Tolt Eastside Supply Line No. 2 - Studies related to the preliminary design of this supply line are being conducted by the SWD. The work includes a review of existing data, pipeline routing studies, hydraulic analysis, and preparation of a route selection report.

F. Highline Well Field - The SWD recently completed construction of a well field in the Highline area for purposes of augmenting the Cedar River water supply during the peak summer demand months. Ongoing studies are evaluating the potential for artificial recharge of this well field to increase its yield.

G. Tolt River Pipeline Well Field - As a companion to the Highline Well Field, the SWD is examining the potential for development of a well field in proximity to the Tolt pipeline corridor. Objectives of the development are to provide additional water supply and to replace surface water or blend groundwater with surface water from the Tolt supply to reduce the level of turbidity entering the distribution system.

H. CWSPs were also initiated simultaneously in other areas of King County. Completion of these documents was coordinated to ensure that uniform design standards, review procedures, satellite system management, and other criteria were developed for implementation within all CWSP areas. Therefore, the completion of the South King County CWSP was delayed to ensure the coordination of these administrative issues with the East

King County CWSP. In addition, the supply strategies of the East and South King County CWSP documents are closely related through interties and wheeling of water. These supply aspects were also coordinated and jointly pursued by the WUCCs from both areas to ensure their compatibility.

It should be noted that the EKRWA proposed that a parallel and complementary GWMP study take place for the entire CWSSA. For various reasons this did not take place. However, an assessment was conducted to identify those principal aquifers which appear to have adequate capacity to be considered regional sources of water supply.

5. FINDINGS AND CONCLUSIONS

Implementation of the Public Water System Coordination Act has provided an opportunity to address a variety of technical, financial, and administrative problems associated with water utility service in East King County. The following is a summary of the major findings and conclusions which were identified and developed during the development of the CWSP. These findings and conclusions led to the development of the policies, procedures, and recommendations which are presented in summary form later in this Section.

A. Administration

(1) The objective of EKRWA and King County in preparing the CWSP is to assist the area's water utilities in establishing an effective process for planning and development of public water systems. This objective has been met by establishing service areas, design standards, service review procedures, a long-term water supply strategy for the area, and a process to pursue resolution of water resource issues, all in a manner that is consistent with King County land use policies.

(2) Within the CWSSA there are 38 Class 1, 54 Class 2, 44 Class 3, 537 Class 4, and 355 systems with pending applications at the time of establishment of the CWSSA. This is a total of 1,028 "existing" systems.

(3) The County right-of-way franchises issued to water systems are non-exclusive and do not establish a definite boundary for capital improvement planning or for the assignment of service responsibilities to utilities. Service area boundaries identified by each utility through the CWSP process will provide this needed assurance and responsibility that must be honored by local and State agencies, as well as the utility.

(4) During the study process, future service area boundary decisions of the Cedar River Water and Sewer District and the Sallal Water Association resulted in changes to the southeasterly boundary of the CWSSA. This administrative correction should be made during approval of the CWSP.

(5) The following utilities were requested to identify their existing and future service area boundaries:

- o All Class 1 systems,
- o Class 2 systems with 50 connections or more,
- o Expanding Class 2 systems of less than 50 connections, and
- o Expanding Class 3 and 4 systems.

The majority of the above Class 1 and 2 systems' boundaries were determined and recorded on a computerized master map which was provided to BALD and SKCHD. The SKCHD has recorded the boundaries for the expanding Class 3 and 4 systems. Service Area Agreements confirming the Class 1 and 2 system's boundaries are required to be submitted by these utilities to document their responsibility and role in the provision of water service.

(6) Utilities having signed Service Area Agreements as a part of the CWSP will have exclusive right to the service area described in the Agreement. Utilities not signing an Agreement will have exclusive rights only to their existing service area.

(7) Design standards and specifications for the construction of water facilities were developed as criteria for developers and utilities alike. They are consistent with King County land use policies. More stringent standards may be applied if mandated by a specific utility. However, prescribed criteria must be met in rural areas which are consistent with the adopted King County Comprehensive Plan.

(8) A Utility Service Review Procedure (USRP) was developed which establishes a uniform procedure for referral of applicants for development approvals to existing water utilities and Satellite System Management Agencies (SSMA) as a first right of refusal of water service. The intent of the process is to identify existing purveyors who are willing and able to provide water service. This procedure will be administered by BALD and help ensure accountability for decisions and clarify the authority of the various agencies.

(9) A Satellite System Management Program was developed to ensure that long-term operations and management is available for existing small systems and for new systems in areas either not designated for service by existing utilities or in areas where existing utilities are unable to provide an immediate connection.

(10) An appeals process was developed to resolve disputes regarding the provision of timely and reasonable service. Appeals may be filed by either a water service applicant, developer, or utility in the event of a dispute arising through the administrative procedure of the CWSP. All appeals are to be submitted in writing to BALD. BALD simultaneously provides the appeal to the EKRWA and the King County Utility and Technical Review Committee (UTRC). If a solution cannot be reached by the EKRWA, a decision is made by the UTRC. The decision of the UTRC shall be binding on all parties, subject to further appeal rights granted by statutes.

(11) The BALD was designated as the King County lead agency in implementation of the CWSP. As such, BALD serves as the initial and primary contact for most institutional and administrative activities. The SKCHD and DSHS also have regulatory roles in relationship to public water systems and will carry out key provisions of the CWSP in East King County.

(12) A framework for a Utility Data Management Center (Center) to be operated jointly by EKRWA and the South King County Regional Water Association (SKRWA) was established. The objective is to assemble, maintain, and provide water quality, water use, mapping, and technical support to the member utilities. The framework recognizes the necessity and contractual requirements for a parallel water quality data file to be developed and maintained by the SKCHD to fulfill their regulatory and groundwater management responsibilities. The water quality data files for the Center and SKCHD should be interchangeable and a joint effort to maintain them in a current date condition.

B. Water Utility Planning and Operations

(1) The CWSP Regional Supplement provides the framework for water supply and system planning. All water purveyors should consider the findings and conclusions of the CWSP and ensure that their individual water system plans are consistent with the CWSP.

(2) Water conservation was addressed early in the study process as a supply option. Drawing upon existing literature and the experience of member utilities, 24 conservation measures were identified as having some potential for successful implementation by East King County utilities. These measures were then grouped for evaluation into the categories of public education, technical assistance, and policy. A three-tiered program was then developed which varies in scope based upon the size of the utility. Each program utilizes the resources of utilities and the EKRWA. The programs (base, moderate, and comprehensive) target water savings of 4 to 8 percent by the year 2000 as expressed in a reduction of the average day per capita consumption requirement.

(3) Future population and water demand forecasting for East King County was conducted using the Puget Sound Council of Governments (PSCOG) database and an econometric model (i.e., statistically based economic model). The model was initially developed by the SWD for forecasting the water demands of the utilities it serves. In cooperation with the SWD, and using data collected from East King County utilities not served by SWD, the model was calibrated for all study area utilities. Population data were then disaggregated into geographical areas representing the future service areas of the larger utilities plus the remaining study area. Water conservation and variables such as weather and the price of water were then imposed upon the demographic data through the model. Forecasts were made to the year 2040 based upon the identified future service areas plus the remaining area and then aggregated into the total regional demand.

A high, base, and low forecast was made. The benchmark year taken was 1986. The increase in demand by the year 2040 was forecast to be an annual average of 123 MGD (high projection), 72 MGD (low projections), and 106 MGD (base projection).

The importance of population and demand forecasting cannot be overstated, nor can the need for periodic updates of these trends and the data used to generate them. Although econometric model forecasting provides a desirable level of sophistication, it requires sufficient input data for many historical and future variables to render reliable results. Therefore, all utilities within the CWSP area, especially Class 1 systems, need to routinely collect information needed to conduct a forecast model during the next update of the CWSP.

(4) Shorter-term population and demand forecasts were used by purveyors to prepare their individual water system plans and identify capital improvements in their system during the next 5-10 years. Longer-range projections have been used for regional resource supply and management strategies.

(5) Each utility is responsible for the preparation of its own individual water system plan. King County and DSHS have agreed that individual water system plans must be submitted for review within 1 year from the date of CWSP completion; i.e., the date of CWSP submittal to the King County Legislative Authority for review. Individual plans submitted earlier may be approved by the County and DSHS. However, all plans will be considered to have the same submittal and approval date as the CWSP.

(6) In many instances, water rights for the utilities appear to be outdated and in need of review and correction by the utility and Ecology. Many systems have certified rights on sources no longer in use which tends to overstate the amount of firm yield.

(7) There are a large number of small water utilities in East King County which are operating with limited financial, staff, and water resources. These systems have difficulty in meeting current needs, and are unable to meet additional requirements imposed by growth or the State and federal Safe Drinking Water Act. The small size and inadequate revenue base of many of these utilities will make it difficult to finance needed improvements. Staffing of such water systems is usually on a volunteer basis and needed maintenance and monitoring is likely to be deferred. County and State support is needed to ensure compliance with public health and minimum service requirements and to encourage the merger of these systems with adjacent larger utilities. This is necessary to provide proper water service. Satellite management services may also provide this assistance.

C. Water Resource Strategy

(1) The current source for the East King County CWSSA can generally be classified into two components. These are the Cedar and Tolt Rivers of the SWD system and springs and wells developed by individual utilities. Present total use (installed capacity), as expressed as an annual average, approximates 48 MGD for SWD wholesale customers and 22 MGD for the individual systems.

(2) Shortages in the decade of the 1990s are forecast among the SWD wholesale customers. The SWD is presently developing two well-fields (Highline and Tolt) which should offset the shortage at least to the year 1997. A major new source of supply is required by 1997.

(3) Some individual utilities not served by the SWD are forecast to experience shortages in the 1990s. These include Samammish Plateau, Issaquah, Northeast Samammish, and Union Hill.

(4) The regional shortage by the year 2040 will be in the range of 80 to 100 MGD. This represents more than a doubling of the current use.

(5) Potential exists for immediate implementation of an effective water conservation program. This should be a joint effort of the utilities and EKRWA. Water conservation should be the foundation of the water resources strategy.

(6) Groundwater will play a minor, but important, role in meeting future water supply demands. An assessment of regionally significant aquifers (i.e., capable of producing 5 MGD or more on a sustained yield basis) identified only two aquifers where water in this quantity appears available for development. These are: (a) an aquifer located generally between Lake Samammish and Issaquah, and (b) an aquifer in the delta at the confluence of the Tolt and Snoqualmie Rivers.

However, this assessment also identified a number of aquifers suitable for subregional supply. It is expected that many of the utilities in the easterly portion of the CWSSA will continue to rely on groundwater to meet their future needs for many years. More data and information as to aquifer yield and water quality needs to be collected on these systems.

Conjunctive use of surface and groundwater should be further examined. Use of groundwater for augmentation of surface water supplies during peak use periods and of the recharge of aquifer systems with surplus surface water should receive further consideration.

(7) Groundwater management programs currently under development for the Issaquah Creek Valley and Redmond-Bear Creek Valley will produce additional water quality and quantity information on these aquifer systems. Institutional management programs will

also be developed which may affect the availability of water for future use. The progress and results of these programs should be monitored for relationships to future updating of the CWSP.

(8) King County is proposing to initiate in 1990, a groundwater management area program for a large portion of East King County in cooperation with the U.S. Geological Survey (USGS). This study should also be monitored for the relationship of its findings and conclusions to the CWSP.

(9) Supply options from surface water sources within the Puget Sound region, from the Nisqually River to the Skagit River, are limited due to competing uses, source development problems, water right considerations, and treatment costs. In most instances, the limiting factor is the established instream flow.

(10) Secondary sources of potential water supply local to the CWSSA (e.g., reuse of treated wastewater, desalination of seawater, purchase and transfer of unused industrial water rights, increase efficiency of Chittenden Locks to free-up additional Cedar River water) were found not to be viable options at this time. Further study/consideration may be warranted for certain source options.

(11) Most potential supply sources do not, standing alone, meet the long-range demand forecast of the CWSSA. A Supply Plan must be the most effective combination of available alternatives based upon an evaluation of environmental, economic, and implementable factors. To this end, the Supply Plan should meet the following objectives:

- o Be implementable within the schedule defined by the demand forecast.
- o Minimize environmental impacts to the degree possible, with specific consideration to optimizing existing developments before developing new watersheds.
- o Give a clear message to SWD on what the Eastside purveyors believe is the best next major supply of water for meeting the Eastside's projected need. Also, include a commitment to work with the SWD in refining the Plan through further study.
- o Recognize the need for use of groundwater on a regional, subregional, and local basis and of the requirement for associated additional studies and investigations.

- o Recognize that 100 MGD may not be adequate to meet the long-term needs or additional demand from adjacent study areas.

- o Recognize that during a 50-year planning horizon many changes in current practices will occur. Consequently, the decisions based on projections beyond a 25-year horizon should be subject to periodic review and possible modification.

(12) The following conclusions are reached with respect to the individual sources and various combinations thereof examined for potential inclusion in the Supply Plan:

- o The scenarios that incorporate the North Fork Snoqualmie supply will require a new dam (high or low) in an area not yet developed and, therefore, may have a greater environmental impact than expansion of the Tolt or Cedar River supply system.

- o The combinations/scenarios that incorporate the Tolt and Cedar River expansion are more flexible in terms of phasing in new or expanding existing facilities.

- o Combinations/Scenario Nos. 3 and 5, described in Section IX, provide lead time flexibility to further study the long-term options for the Eastside and to incorporate the Puget Sound Urbanizing Area (Skagit to Thurston County and Kitsap County) in the consideration of the second major surface supply source (i.e., Skagit River, North Fork Snoqualmie River, and Cedar River).

- o The CWSP and associated Supply Plan will be reviewed and updated, as required, on a 5-year schedule. This will enable the EKRWA to further consider the Skagit River and North Fork Snoqualmie River as new supply. The schedule will also enable the EKRWA to join with Seattle, Tacoma, and Everett, in continuing to optimize the use of existing supplies.

- o Groundwater availability in the CWSP study area is very limited, based on a review of existing hydrogeologic data, investigations by two qualified hydrogeologists, and a preliminary review by USGS. Two aquifers (near Issaquah and Tolt Delta) were identified as potential regional sources of water supply.

Identification and integration of other instream and out-of-stream use plans by the State, Tribes, and other users need to continue to be pursued by the Washington Water Utility Council.

(13) Short-term (pre-1997) supply problems that relate more to transmission deficiencies in the regional system are not addressed in the Supply Plan. Interim action is required to respond to the accelerated population growth in the area immediately east of Lake Samammish.

6. RECOMMENDATIONS

The following recommendations provide guidance to the County and water purveyors in implementing the water system development programs which will meet the needs of East King County.

A. Administration

(1) The PP&R/BALD should continue to serve as the lead agency in guiding the implementation of the CWSP.

(2) Following adoption of the CWSP, the Boundary Review Board should be formally notified of those utilities who have signed Service Area Agreements, of the service area boundary of each such utility and be requested to recognize these boundaries in the conduct of Boundary Review Board responsibilities.

(3) The service area boundaries established by the CWSP process should be recognized in the County franchise program for the provision of utility service.

(4) Procedures for the review and approval of water service to new developments located in the County should follow the USRP, identified in Section V of this CWSP.

(5) DSHS and King County should establish, by appropriate rule and ordinance, a Satellite System Management Program, as outlined in Section VI of this CWSP. The goal of this program is to guarantee that long-term operations and management responsibility will be provided by qualified agencies for new and existing satellite water systems.

(6) King County should review and amend, if necessary, existing Code 13.24, to ensure the UTRC has the authority to review and resolve appeals or disputes, as provided in the CWSP. These appeals or

disputes may be filed either by a water service applicant, a developer, a utility, or another affected entity over matters pertaining to the timely and reasonable provision of service.

(7) King County should adopt, by ordinance, the Minimum Standards and Specifications for water utilities, developed by the East King County WUCC, outlined in Section IV. A water utility may adopt more stringent standards in its own service area, as long as standards in rural areas are consistent with the adopted King County Comprehensive Plan.

(8) EKRWA should complete development of the Center and enter into appropriate agreements with the SKRWA, SKCHD, and other agencies for data management and technical service assistance.

B. Water Utility Planning and Operations

(1) It is recommended that, unless a documented health problem exists, approval of proposed system expansions be denied for systems that have not submitted their Water System Plan or Service Area Agreement within 1 year from the date of submittal of the CWSP by the WUCC to the County Council.

(2) Each water utility should verify that Ecology has properly recorded water rights for the sources and service area of its water system. A water right application should be filed immediately if adequate rights are not recorded. Utilities wishing to retain rights on sources no longer in use should work with Ecology to evaluate the likelihood of developing another facility from the same source, thereby enabling application for a change in the point of diversion/withdrawal. Any unused or non-transferrable water rights should be relinquished.

(3) Water utilities already having or which are interested in participating in interties, regional supplies, or other shared facilities, should identify the appropriate encompassing boundary as the place of use for all new water right applications. Further, Ecology should be requested to revise existing water rights for these utilities to reflect a place of use that encompasses the expanded boundary.

(4) Water utilities throughout East King County should adopt the water conservation program presented in Section VII and actively pursue measures of implementing the program as a means to reduce future water demands and to postpone future source

development. In addition, the utilities should work closely with Ecology, DSHS, and local agencies to facilitate State and local legislation that supports prudent conservation measures by all users of ground and surface waters of the State. It is further recommended that the EKRWA support utility efforts by implementing those elements of the conservation program assigned to EKRWA.

(5) Utilities should include in capital facilities planning the capability to provide fire flow, as required by the Minimum Standards and Specifications.

(6) Utilities participating in regional supply network development should develop joint financing and source development programs based on mutual benefits.

(7) All interties with adjacent utilities should be sized to accomplish the appropriate regional objective of reliability, regional transmission, and/or emergency interties.

(8) The WUCC should work closely with Ecology and DSHS to reach agreement on the appropriate variables for econometric modelling of water demand forecasts. Once agreement is reached, the WUCC should notify utilities of the type of data and frequency of collection required to refine the modelling forecast during the update of the CWSP. The WUCC should monitor the progress of key utilities in collection of this data and to submit the data for inclusion in the EKRWA/SKRWA Center.

C. Water Resource Strategy

(1) The EKRWA should adopt a Supply Plan which will, in cooperation with the SWD, result in the following actions:

- o Prior to 1997 - Develop well field located near Issaquah as a regional source of water.
- o Prior to 1997 - Construct a filtration plant for the South Fork of the Tolt to develop additional supply from existing reservoir.
- o Prior to 2010 - Develop North Fork Tolt system with water filtration.

- o Prior to 2030 - In cooperation with Puget Sound area utilities, local governments, tribes, and others, further study the development of the North Fork Snoqualmie, Skagit, and Cedar Rivers projects to identify the preferred method of meeting the Puget Sound area's municipal and industrial water supply needs.

(2) In addition, the EKRWA should:

- o Support the SWD negotiations and plans to fully develop the Cedar River Watershed as a major component of the Puget Sound Regional Supply System. Planning activities for the Cedar River should include a joint federal/state/local study of the Lake Washington drainage basin to evaluate options for improved efficiency of water use at the Chittenden Locks, regulation of the outflow of Lake Samammish, and other potential basin water management projects.

- o Support projects that will maximize the use of surface and groundwater development in a conjunctive mode and utilize interbasin transfers to make full utilization of existing systems.

- o Formally request Ecology to withdraw waters of the North Fork Snoqualmie and the Skagit Rivers from additional appropriations of 5.0 cfs/3.2 MGD or more in accordance with RCW 90.54.050(2) until July 1, 1994, or until the State reserves municipal water supply, in accordance with RCW 54.54.050(1), for the future municipal needs of the Puget Sound area, whichever occurs first.

- o Assist the water utilities in immediately evaluating the potential for development of the aquifer located near Issaquah as a regional supply source.

- o Assist the water utilities in further evaluating the potential developable yields of the aquifers located in the rural area for use as subregional supplies.

- o Continue to work in cooperation with the SKRWA to maintain a Data Management Center for primary benefit to water utilities.

- o Support the inclusion of Phase III of Tolt Pipeline No. 2 in the SWD capital improvement program for completion by June, 1992.

(3) The WUCC should monitor the following groundwater study activities for their relationship to future updates of the CWSP:

- o The Issaquah Creek Valley and the Redmond-Bear Creek Valley Ground Water Management Plans now under preparation.

- o The Ground Water Management Plan proposed for initiation by King County in 1990. This Plan will cover a large portion of the East King County CWSSA.

D. Implementation

(1) Several programs and studies which are vital to the provision of efficient and reliable utility service in East King County have been identified in the CWSP. The programs and studies are generally presented in Exhibit I-1 along with recommended time frames for their implementation. Each water purveyor should assist in the implementation of the programs and studies.

(2) Once approved by the WUCC, this CWSP should be reviewed by King County for conformance with County policies and submitted to DSHS for approval pursuant to Chapter 70.116 RCW.

(3) The King County Council should administratively amend the CWSSA external boundary to incorporate adjustments identified in Exhibit II-2.

(4) The WUCC and County agencies should assist DSHS, as requested, in the resolution of unresolved service area conflicts to ensure that final service areas are consistent with County utility service objectives.

(5) Twice annual meetings of the WUCC should be scheduled to review CWSP implementation.

(6) The minimum water systems standards presented in Section IV should be reviewed annually by a review committee of the WUCC. Recommended revisions should be submitted to the County Council for adoption.

(7) The objectives and procedures outlined in the CWSP are considered to be reasonable and achievable by all properly operated water systems. Repeated failure to provide safe, reliable, and minimum levels of water service, as measured by the CWSP criteria, should serve as a basis to evaluate adequacy of service. If a water purveyor repeatedly violates health and operational standards, the WUCC, King County, and DSHS should evaluate procedures to ensure the system is upgraded or placed into receivership. Such a program must follow due process. However, the customers have a right to expect good quality water service based on cost of service.

(8) This CWSP should be revised and updated, as necessary, every 5 years, as prescribed by Chapter 70.116 RCW.

EXHIBIT I-1

CWSP IMPLEMENTATION SCHEDULE
(August, 1989)

Program Elements	1 Q 1990	2 Q 1990	3 Q 1990	4 Q 1990	1 Q 1991	2 Q 1991	3 Q 1991	4 Q 1991	1992	Comments
1. Plan Adoption										
A. CWSP	(1)	(2)								
B. Individual Water System Plans					(1,2)					
2. DSHS Resolve Service Area Conflict	(2)									
3. DSHS Program on:										
A. Satellite System Management		(2)								
B. Small System Financial Criteria		(2)								
4. King County Ordinances										
A. Minimum Design Standards		(1)								
B. Satellite System Management			(1)							
C. UTRC Review Authority		(1)								
D. Service Area Boundaries Recognized in Boundary Review Board & Franchise Activities		(1)								
E. Service Area Agreement A Prerequisite to Expansion of Service		(1)								
F. Amend Standards for Approval of Water Comprehensive Plans			(1)							
5. Water Utility Coordinating Comm.										
A. Scheduled Meetings				(3)		(3)		(3)	(3)	Twice Annually
B. Establish Appeal Resolution Group			(3)							
C. Review Design Standards				(3)				(3)	(3)	Annually
D. Monitor GWMP Activities										Ongoing
E. Reach Agreement w/DSHS & Ecology on Econometric Modelling of Demand Forecasting	(3)									

EXHIBIT I-1 continued

Program Elements	1 Q 1990	2 Q 1990	3 Q 1990	4 Q 1990	1 Q 1991	2 Q 1991	3 Q 1991	4 Q 1991	1992	Comments
6. Regional Water Association										
A. Implement Water Conservation Program			(3)							Possibly Phased
B. Submit Request for Withdrawal of Waters of North Fork Snoqualmie & Skagit Rivers from Further Appropriation			(3)							
C. Support SWD Studies of Cedar River Basin										Ongoing
D. Assist Utilities in Evaluation of Well Field Near Issaquah		(3)								
E. Assist Utilities in Evaluation of Subregional Aquifers										On Request
F. Implement Database Management System	(3)									
7. Update CWSP										Every 5 Years

Footnotes:

(1) Acceptance or approval by County.
(2) Adoption or approval by State regulatory agency.
(3) Action by other agency/entity.

SECTION II

SECTION II

THE COORDINATED WATER SYSTEM PLAN PROCESS

1. INTRODUCTION

The Public Water System Coordination Act, enacted in 1977 and codified as Chapter 70.116 RCW, establishes a procedure for the State's water utilities to coordinate their planning and construction programs with adjacent water utilities and other local governmental activities. This Act specifies that the Department of Social and Health Services (DSHS) or the County Legislative Authority may declare an area within a County as a Critical Water Supply Service Area (CWSSA). This declaration is based upon the findings of a Preliminary Assessment identifying problems related to inadequate water quality, unreliable service, or lack of coordinated planning.

In 1971, the State Legislature enacted the Water Resource Act, Chapter 90.54 RCW, which set forth fundamentals of water resource policy to ensure the waters of the State will be protected and fully utilized for the greatest benefit of the people of the State. Subsequently, "Procedures Relating to the Reservation of water for Future Public Water Supply," Chapter 173-590 WAC, were established. These procedures are available to public water systems within a geographical area for use in reserving water rights required to meet their projected domestic needs over the next 50 years. This program is administered by the Department of Ecology (Ecology) in an effort to resolve competing water use activities within a geographical area and establish a management system that will ensure that an efficient overall water resource program is developed.

The Public Water System Coordination Act and the Water Rights Reservation processes may be used individually or in combination by the local public water utilities. Implementation of either of these laws requires that a Coordinated Water System Plan (CWSP) be prepared for the study area. The East King County CWSP has been prepared in accordance with requirements of both. It consists of a compilation of water system plans prepared by each expanding water utility, and this document, which is known as the Regional Supplement. A listing of applicable supporting regulations is provided in Appendix B.

2. PRELIMINARY ASSESSMENT

In an effort to address various issues and concerns related to water supply in King County, a Preliminary Assessment of problems related to water supply and fire protection issues, water quality, and reliability of service was prepared by King County. This report, titled, "Preliminary Assessment of Water Supply and Fire Protection Issues in King County" was completed by the King County

Department of Planning and Community Development and accepted by the King County Council by Motion No. 6407, on December 16, 1985. Based upon interests of East King County water purveyors, the Preliminary Assessment was updated to reflect facts concerning water supply issues in their area. An updated report was issued in November, 1986, and subsequently accepted by the King County Council.

Several problems were identified in the Preliminary Assessment, many of which could be solved on an individual utility basis. There were, however, a number of problems the Preliminary Assessment identified as being most appropriately solved through implementation of the Coordination Act. These items are summarized in the recommendations of the Preliminary Assessment as shown in Exhibit II-1.

Based on the conclusions of the Preliminary Assessment, the King County Council declared East King County a CWSSA through Ordinance No. 7893, passed on December 22, 1986.

By this action, the Public Water System Coordination Act was invoked. A Water Utility Coordinating Committee (WUCC) was formed by King County Ordinance No. 7894, also passed on December 22, 1986. The WUCC was made up of representatives of all purveyors with 50 or more service connections, as well as representatives from King County and DSHS.

As its first action, the WUCC recommended the External Boundaries of the CWSSA. The County Council formally adopted the External Boundaries on September 8, 1987, by Ordinance No. 8214. During the study process, future service area boundary decisions of the Cedar River Water and Sewer District and the Sallal Water Association resulted in changes to the southeasterly boundary of the CWSSA. These changes are shown on Exhibit II-2. The WUCC recommends the adoption of these changes in the final plan approval.

3. CWSP PREPARATION

Preparation of the CWSP involved the joint efforts of participating local WUCC members and County agency staff through approximately 2 years of monthly meetings. A formal committee structure was utilized which emphasized plan development and decision making by WUCC members. Through a network consisting of the WUCC, a Steering Committee, and four subcommittees, maximum involvement of interested parties was achieved. This organizational structure is shown on Exhibit II-3. Membership lists of the four subcommittees are included in Exhibit II-4. The contribution of the subcommittee members and their chairpersons was significant in molding the policies that direct and drive the CWSP.

In addition, several meetings were held to coordinate activities with representatives of King County and the South King County CWSP. A special effort was made to achieve a high degree of consistency between the basic program elements of the East and South King County plans.

Coordination also took place with respect to groundwater studies being conducted under the ongoing Issaquah Creek Valley and Redmond-Bear Creek Ground Water Management Area programs.

The following areas received particular emphasis during preparation of the CWSP:

A. Future Service Area

Each utility was requested through correspondence, and during the WUCC meetings, to plot its existing and future service area boundaries on a map. Each Class 1 and 2 system was sent a certified letter, along with a 7-1/2' U.S. Geological Survey (USGS) map, requesting identification of its proposed future service area. Class 3 and 4 systems were contacted by Seattle-King County Health Department (SKCHD) to determine those anticipating future service expansion. The future service area boundaries of Class 1 and 2 utilities were plotted on base maps to identify conflicting or unclaimed areas. Those utilities that did not identify their future service area were assumed not to be interested in expanding. For those utilities, the future service area was assumed to correspond to the existing service area. A standard agreement was formulated to allow utilities to recognize adjacent service areas by reference to the standard base maps.

One overlap in future service area boundaries was not resolved and was referred by the WUCC to DSHS for resolution. The overlap involves the City of Redmond and the Union Hill Water Association.

B. Minimum Design Standards

This subject included a diverse list of considerations by the utilities, including: material specifications, construction practices, distribution facilities, metered services, fire flow requirements, etc. The content and application of these standards were developed jointly through input of WUCC representatives and the County. Consistency with standards developed for the South King County CWSP was achieved.

Final standards are included in Section IV. When accepted and adopted through ordinance by the County and approved by DSHS, these will become the minimum standards for all new water system improvements. A water utility may adopt these standards by reference, or may adopt more stringent standards.

C. Utility Service Review Procedure (USRP)

The USRP was developed to identify the appropriate purveyor, both willing and capable, to provide water service to new developments and expansions. This procedure utilizes the recognized future service areas as a basis for assigning new applicants for development permits to water utilities. In undesignated areas, the procedure emphasizes adjacent utilities with an approved water system plan as the preferred service providers. If adjacent and qualified utilities do not exist, the Building and Land Development Division (BALD) may refer a developer to a Satellite System Management Agency (SSMA). A structured uniform approach in utilizing this review procedure was developed jointly with other WUCCs. The recommended program for utility service review is outlined in Section V.

D. Satellite System Management Agency Program

A program for providing satellite management services to existing and new water systems was developed. These services would be provided by SSMAs meeting qualifications established by DSHS. This program is described in Section VI.

E. Regional Water Supply

The regional supply needs of East King County were evaluated in 10-year increments through the year 2040. Forecasts of future population and water demand within the area were made based upon Puget Sound Council of Governments (PSCOG) population estimates and water use data from local utilities. A water conservation program was developed and factored into the water demand forecast.

An additional water demand of approximately 100 MGD was forecast to be required for the study area by the year 2040. Major surface water sources from the Nisqually River on the south to the Skagit River on the north, were examined as to water supply availability. An assessment was also conducted of the principal aquifers/groundwater sources within the East King County study area. From this examination, five alternative scenarios/plans for meeting the study area needs were developed. The conclusion was that a conjunctive use program of surface and groundwater supplies be adopted. This program has two phases. The first phase

relies upon development of the Highline, Tolt, and Issaquah wellfields and the North Fork Tolt River. Alternative sources for further study are identified for the second phase. Section VII contains a full discussion of the sources examined and conclusions reached.

F. Water Rights

A thorough review of the status of existing water rights was conducted for Class 1 and 2 utilities within the CWSSA. Two sources of information were compared. One source was the water right printout records and the water right claims registry of Ecology. The other was in-service/installed capacity information obtained from utility questionnaire responses, utility comprehensive water plans, and the Water Facility Inventory of DSHS. The result was a determination of: (1) where a utility's present use appears to not be adequately covered by water rights; and, (2) those instances where a utility holds water rights for future expansion of use.

These determinations were used in assessing the capabilities of existing utilities to meet current and future water needs and in evaluating the data requirements for filing a petition for water right reservation.

G. Individual Water System Plans

The Public Water System Coordination Act states that each purveyor within the external boundary of a CWSSA shall be responsible for preparing a Water System Plan for the purveyor's future service area. This plan is to describe the utility's proposed method for serving its area. An exception to this criteria exists for non-municipally owned public water systems that existed prior to September 21, 1977, and which have met minimum State Board of Health requirements but do not plan to extend water service beyond their existing area.

The planning requirements are determined by DSHS and vary for utilities based upon their size. These requirements are summarized as follows:

(1) Systems over 1,000 service connections - complete water system plan.

(2) From 100 to 999 service connections - abbreviated water system plan.

(3) Remaining systems - planning questionnaire.

A complete description of the information and data required under each of the three levels of plans is presented in Appendix C.

In addition to the above requirements, all systems within a CWSSA must, in the preparation or update of their plan, address concerns relating to the entire CWSSA. These concerns include:

- o Map of future service area,
- o Signed service area agreement,
- o Population and water demand projections,
- o Design standards,
- o Implementation of minor and major regional projects,
- o Implementation of water utility service review procedure,
- o Implementation of satellite system management program, and
- o Water conservation program.

It should also be noted that Chapter 13.24 King County Code requires that a King County Water Comprehensive Plan be approved by the King County Council as a prerequisite for the granting of new right-of-way franchises, right-of-way construction permits, and right-of-way franchise renewals.

Exhibit II-5 illustrates the procedure established for the review and approval of individual water system plans by the County and DSHS. This procedure should be utilized for plans reviewed as a component of the CWSP. It is recommended as the method to be used for review of new and updated individual plans.

4. REGIONAL SUPPLEMENT

This plan has been prepared under the provisions of WAC 248-56-700 which allows for a CWSP which consists of: (1) a compilation of water system plans approved by DSHS, and (2) a supplement which addresses water purveyor concerns relating to the entire CWSSA. All completed water system plans of the individual utilities are incorporated herein by references, as Appendix A, and are kept on file at DSHS and/or King County. The review and approval procedure for this document, the Regional Supplement, is outlined in Section XI.

Table II-1 lists the Class 1, 2, and expanding Class 3 and 4 water utilities and indicates whether their signed boundary agreement has been filed, the level of their water plan requirements, and if a plan has been submitted and approved. This Table serves a number of purposes including the following:

A. Identifies for each utility its degree of compliance with the planning requirements of the CWSP.

B. Assists King County and DSHS in their review of the CWSP for consistency with County policies and state statutes and regulations.

C. Directs King County and DSHS attention to those utilities which must satisfy basic CWSP planning requirements before system improvement and/or expansion of service takes place.

As indicated on Table II-1, some utilities have not submitted their service area agreement or water system plans. The WUCC recommends that all water utilities complete these documents and submit them to DSHS and BALD no later than 1 year from the date the CWSP is submitted to King County for review. Unless a documented health-related improvement is involved, approval of proposed system expansions, should be denied for utilities not meeting these requirements after that date. If a service area conflict arises, development activity should be denied within the contested service area. Due to the importance of tracking the status of these utilities, the BALD should be responsible for updating the service area maps and Table II-1. The AutoCAD disks used to develop the base map and all service areas have been provided to BALD for this purpose.

The Regional Supplement has been completed and is represented by the document contained herein. The compilation of individual water plans indicate that many utilities must prepare or update their plans. WAC 248-56-800 enables DSHS to approve portions of the CWSP found to be consistent with adopted plans and policies. As additional water system plans receive County and DSHS approval, they may be administratively included within the adopted CWSP.

TABLE II-1

EAST KING COUNTY
WATER UTILITY PLANNING STATUS SUMMARY

System Name	DSHS ID No.	Boundary Agreement Filed	Service Connections (1)	Type of Plan (2)	Date of Last Plan	Status (6)
Class 1						
Ames Lake Water Assn.	020550	Yes	402	A	1984	Plan is current (3)
Cascade View Water	419958	Yes	175	A	1986	Plan is current (3)
Cedar River Water & Sewer	418007	Yes	3,090	F	1982	Plan due/extension granted
City of						
Beaux Arts	051600		115	A		Plan due
Bellevue	05575B		29,202	F	1985	Supplement required (4)
Bothell	07900L		2,300	F	1980	Plan due, extension granted
Carnation	11200B		535	A	1974	Plan due
Duvall	207508	Yes	403	A	1987	Plan is current (3)
Issaquah	363505	Yes	2,275	F	1987	Plan is current (3)
Kirkland	42250T		6,555	F	1984	Plan is current (3)(5)
Mercer Island	536405	Yes	6,582	F	1981	Plan due, extension granted
North Bend	60100A		1,023	F	1985	Plan is current, (3)(5)
Redmond	71650B		4,943	F	1983	Plan due
Renton	71850L	Yes	11,735	F	1983	Plan due
Snoqualmie	81080C		965	A	1975	Plan due
King County Water Dist.						
No. 1	38650N		180	A		Plan due
No. 42	39600E	Yes	7,500	F	1982	Plan due
No. 83	40950K	Yes	800	A	1984	Plan is current (3)(5)
No. 90	41150L		3,946	F	1984	Plan is current (3)(5)
No. 107	41750C		5,427	F	1986	Plan is current (3)(5)
No. 119	419850	Yes	470	A	1983	Plan due
No. 127	245508	Yes	673	A	1982	Plan due
Maplewood Addition Coop.	51400Q	Yes	145	A		Plan due
Mercer Crest Water Assn.	536004		265	A		Plan due
Mirrormont Services, Inc.	552501		605	A	1985	Plan is current (3)(5)
NE Lake Washington S&W	408005	Yes	15,357	F	1980	Plan due, extension granted
NE Sammamish S&W	75265X		1,985	F	1983	Plan due

TABLE II-1 continued

System Name	DSHS ID No.	Boundary Agreement Filed	Service Connections (1)	Type of Plan (2)	Date of Last Plan	Status (6)
Overdale Park Water	65000H		126	A		Plan due
Riverbend Homesites	72750J	Yes	522	A		Plan due
Riverbend Mobile Home Park	72808H		100	A		Plan due
Rose Hill Water & Sewer	40850E	Yes	6,200	F	1982	Draft plan in review
Sallal Water Assn.	755600	Yes	586	A	1979	Plan due
Sammamish Plateau W&S	409009	Yes	5,200	F	1980	Plan due, extension granted
Shorewood Apartments	78795J		568	A		Plan due
Soos Creek W&S	401008		16,547	F	1988	Plan is current (3)(5)
Union Hill Water Assn.	902603		1,100	F	1975	Plan due
Wilderness Rim Maint. Assn.	96878M	Yes	550	A		Plan due
Woodinville W&S	416004		8,614	F	1984	Plan is current (3)(5)
			147 766			
Class 2						
Alpine Mobile Manor	01830V		44	Q		Planning questionnaire required for all Class 2 and expanding Class 3 and 4 utilities
Avon Villa Trailer Park	034352		88	Q		
Blue Sky II Mobile Home Pk.	01001K	Yes	12	Q		
Campton Water Supply	109974		37	Q		
Carnation Research Farm	111809	Yes	6	Q		
Cedar Grove Mobile Home Pk.	119153		62	Q		
Cedar Heights Water	119258		12	Q		
Dawnbreaker Water Assn.	12154M		18	Q		
Dorre Don Water System	19850X		72	Q		
Echo Glen Children's Center	22330B	Yes	63	Q		
Edgehill Water Assn.	22400P	Yes	36	Q		
Elderwood	226909		13	Q		
Evergreen Hghts. Wtr. Coop.	24100E		10	Q		
Forest Grove Hills	25932B		22	Q		
Four Creeks Ranch Water	227404		12	Q		
Four Lakes	26195F		61	Q		
Gesell Addition	27510D		28	Q		
Green Acres Water Assn.	296559		13	Q		
Harmon Heights Water Coop.	31300J		13	Q		
Hartman Water	31540J		10	Q		
Heathercrest	32125E		43	Q		

TABLE II-1 continued

System Name	DSHS ID No.	Boundary Agreement Filed	Service Connections (1)	Type of Plan (2)	Date of Last Plan	Status (6)
Inglewood Park Water Co.	35700A		36	Q		
Issaquah Valley Water	36300V		14	Q		
King County Water Dist.						
No. 17	38850X		98	Q		
No. 117	41980D		41	Q		
No. 123	41996R		78	Q		
Lake Margaret Water System	44200M	Yes	60	Q		
Lake Tuck Water System	44965N		25	Q		
Locloman Subdivision	47660W		58	Q		
Maple Vista	51350W		18	Q		
Mint Grove	55150W		18	Q		
Mobil Home Wonderland	55455V	Yes	98	Q		
Mt. Si Mobil Home Estates	56560Q	Yes	85	Q		
Mt. View Water Dist.	569500		43	Q		
North Bend Mobile Home Pk.	600593		39	Q		
Orchard Grove	640708		42	Q		
Panther Lake North	659607		20	Q		
Rakwanna Park Water System	255866		22	Q		
Reed Ranch Road Water	11985W		17	Q		
Sammamish View Park	75700E		16	Q		
Skyline-Duvall	122282		10	Q		
Spring Glen Assn.	83295L	Yes	54	Q		
Spring Glen Mobile	832901		44	Q		
Spring Hill Development Co.	833103		18	Q		
Stone Creek Estates	84530X		17	Q		
Strandvik	845807		26	Q		
Tiger Mountain Tracts	883150		19	Q		
Tokul Creek Community	88625M		13	Q		
Trails End	890504		43	Q		
Twenty-Three 800 Tiger Mountain Rd.	90875P	Yes	60	Q		
Twin Cedars	89870N		12	Q		
Upper Preston Water Users Assn.	907006		44	Q		

TABLE II-1 continued

System Name	DSHS ID No.	Boundary Agreement Filed	Service Connections (1)	Type of Plan (2)	Date of Last Plan	Status (6)
Valley View Trailer Park	90998W		42	Q		
Weber Point	93970E		23	Q		
Weona Beach	944002		13	Q		
Class 4 (expanding)						
Brammer	245632		4	Q	1989	Planning Questionnaire on
Caldwell Community Water	23351E		2	Q	1989	file with SKCHD
Corbin, P.	14940F		4	Q	1989	" "
Davis-North Bend	70030		6	Q	1989	" "
Dillon/McLaughlin	00732P		2	Q	1989	" "
Goodsell, D.				Q	1989	" "
Grotheer/Weckwerth	090266		2	Q	1989	" "
Hale, R.	29715C		2	Q	1989	" "
Hansen, G.	422011		3	Q	1989	" "
Hoffman Water System	24827F		9	Q	1989	" "
Hughes, W.	01642		2	Q	1989	" "
Lake Alice Water System #1	21864R		2	Q	1989	" "
Lemon, R.	21890F		3	Q	1989	" "
Maxfield/Crenshaw	37944T		2	Q	1989	" "
Middle Fork Woodlands	081751		9	Q	1989	" "
Onley, R. W.	232412		2	Q	1989	" "
Palmer, Jack	22334D		5	Q	1989	" "
Park Place	66140Q		6	Q	1989	" "
Pierce/Johnson	67303K		2	Q	1989	" "
Stern, W.	01226X		4	Q	1989	" "
Sutherland, G.	01271M		2	Q	1989	" "
Tolt River Estates			6	Q	1989	" "

TABLE II-1 continued

Footnotes:

(1) Service connection information taken from DSHS Public Water Supply Listing dated November 4, 1988.

(2) Plan requirements are designated as:

F = Full/complete plan
A = Abbreviated plan
Q = Planning questionnaire

(3) Even though a utility's plan is current, once the CWSP is adopted the utility must formally notify DSHS of its acceptance of the supplementary provisions of the CWSP.

(4) The City of Bellevue has advised of its intent to sign the boundary agreement once it has executed interlocal agreements with adjacent utilities.

(5) Service area boundary agreement required.

(6) Where status is indicated as "Plan Due," the Plan update is to be completed within 1 year of the date the CWSP is submitted to the County Council for review.

EXHIBIT II-1

RECOMMENDATIONS OF THE PRELIMINARY ASSESSMENT OF WATER SUPPLY AND FIRE PROTECTION ISSUES IN KING COUNTY

Critical Water Supply Area Designations

The following areas should be designated Critical Water Supply Areas (CWSA). Coordinated Water Supply Plans should be developed as mandated by the Public Water System Coordination Act:

1. Vashon Island CWSA designation will facilitate the further research and monitoring. A management program is needed to preserve and protect limited groundwater resources.

2. South King County CWSA designation will facilitate the development of a long term water supply strategy to coordinate growth with the supply needs of the many Class 1 water systems in the area.

3. Skyway CWSA designation will facilitate development of a plan to coordinate improved water supply and service for the large number of water purveyors in this small area.

4. Eastside CWSA designation will facilitate the development of long-term supply plans, provide a forum to discuss supply conflicts, allow satellite management of smaller, failing water systems, and provide for coordinated water supplies in a rapidly growing area.

Ground Water Management

5. King County should develop a County-wide groundwater quality protection program. The program should include:

   A. Groundwater supply and recharge area identification.

   B. Study and evaluation of groundwater problems and current groundwater protection practices.

   C. Designation of areas for special study under HB 232 and HB 1138.

   D. Recommendations for a strategy to coordinate and implement groundwater protection programs which will rectify current groundwater quality problems, include groundwater protection as a goal in community plans, and improve

groundwater quality monitoring.

6. King County needs to review current groundwater withdrawal practices and develop a comprehensive strategy to coordinate to the extent of its powers the present and future use of the County's limited groundwater resources.

Regional Water Supply Management

7. King County should coordinate a strategy (with the participation of water districts, municipalities and small water purveyors) to address local supply problems among the purveyors.

8. The County should help establish logical service areas for existing major purveyors. Within these service areas new systems should not be allowed.

9. King County should encourage Class 1 water systems to make service available to small water systems within their Comprehensive Plan area.

10. King County should actively participate in existing and future regional forums (e.g. the Puget Sound Council of Governments Water Resources Committee) to address regional water supply and water quality issues.

Coordination with DOE

11. The County should participate in DOE programs to define criteria for setting maximum net benefit and minimum instream flows.

Amendments to King County Development Codes

12. King County should amend King County Code Title 19, Subdivisions to require that plats with more than four lots connect to existing Class 1 and 2 water supply systems if the plat is located in the logical service area of an existing Class 1 or 2 water system.

13. King County should amend its short subdivision requirements to require installation of a water system by the developer prior to final approval of a short plat.

14. New developments (other than subdivisions) should be required to become part of an existing purveyor's system when they are within the purveyor's logical service area.

15. King County should require the formation of Satellite

Management, Maintenance and Sampling Systems for areas where more than two small water purveyors exist. Either nearby Class 1 water systems or an administrative body formed by the smaller water purveyors would be responsible for monitoring water quality and insuring reliable service and maintenance for the group of purveyors.

Improvements to Water Quality Protection

16. King County should participate in the State Department of Social and Health Services (DSHS) program to develop new standards for monitoring toxic chemicals that threaten water quality.

17. Water quality information needs to be exchanged among various agencies (King County, DSHS, and DOE) to determine where water quality problems are developing and how best to prevent them. King County should ask DSHS to take the lead in setting up an information exchange system.

18. King County needs to budget additional staff for the King County Department of Public Health so that it can fulfill its responsibility for regulating small water systems (monitoring and enforcing water quality standards and surveying water systems for general maintenance and operation practices).

Fire Service Master Plan

19. King County should prepare a Fire Service Master Plan. Fire service and land development need to be coordinated at a County-wide level. Fire service standards should be developed for use in review of new development.

20. Road and access policies and standards should be improved by the County to assist in the County's efforts to ensure adequate emergency assistance and fire fighting response.

21. King County should revise development standards for building type, location, and land use to provide more effective coordination with fire service operations.

22. Solutions to the problems of substandard fire hydrants requires a forum which encourages all affected parties to work together. King County should convene a committee of fire and water districts with hydrant problems and take the lead role in solving the problem.

23. The County needs to adopt regulations that require fire hydrants, or other fire protection devices when hydrants/ fireflows are not provided.

EXHIBIT II-2
EAST KING COUNTY
CRITICAL WATER SUPPLY SERVICE AREA

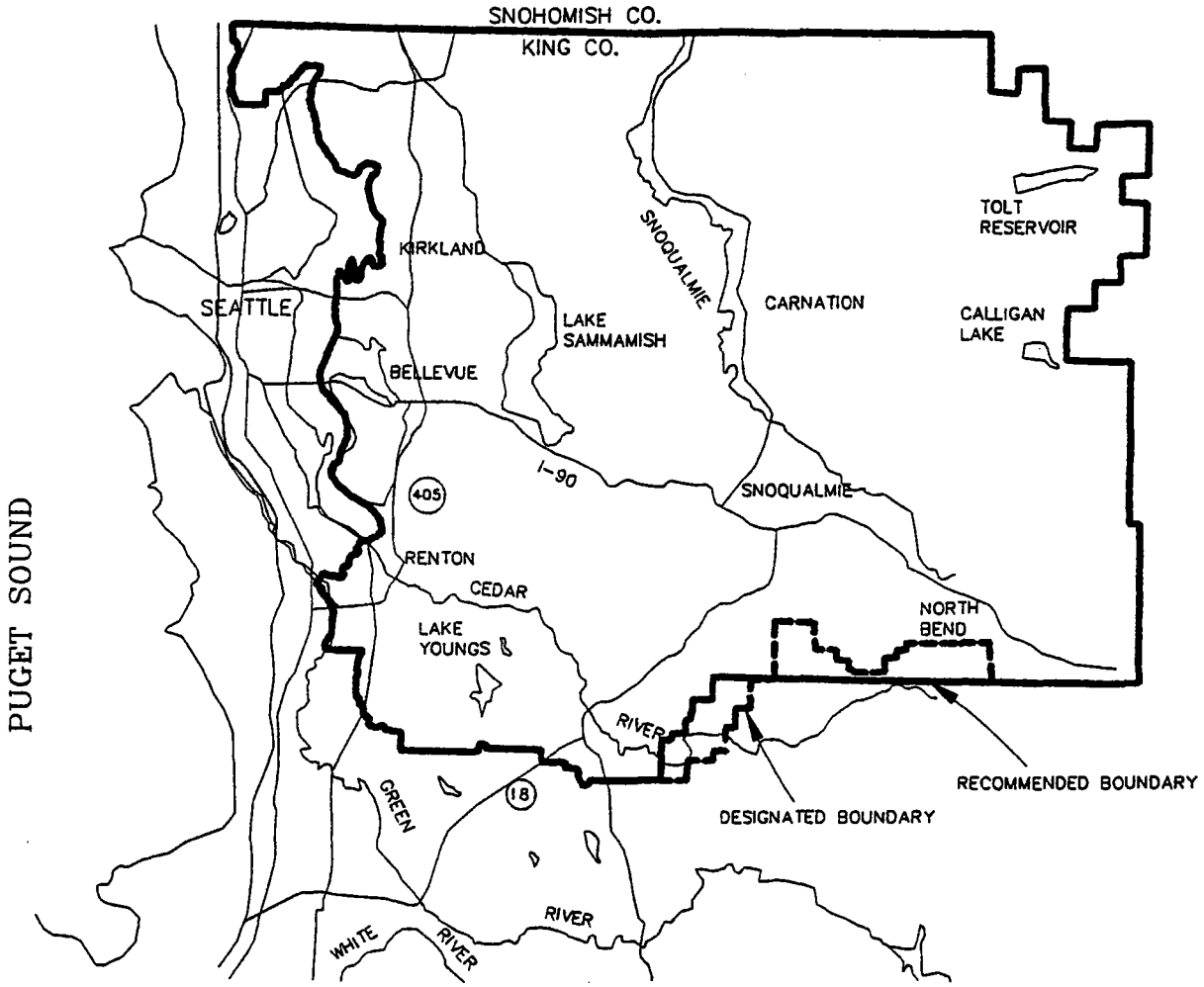
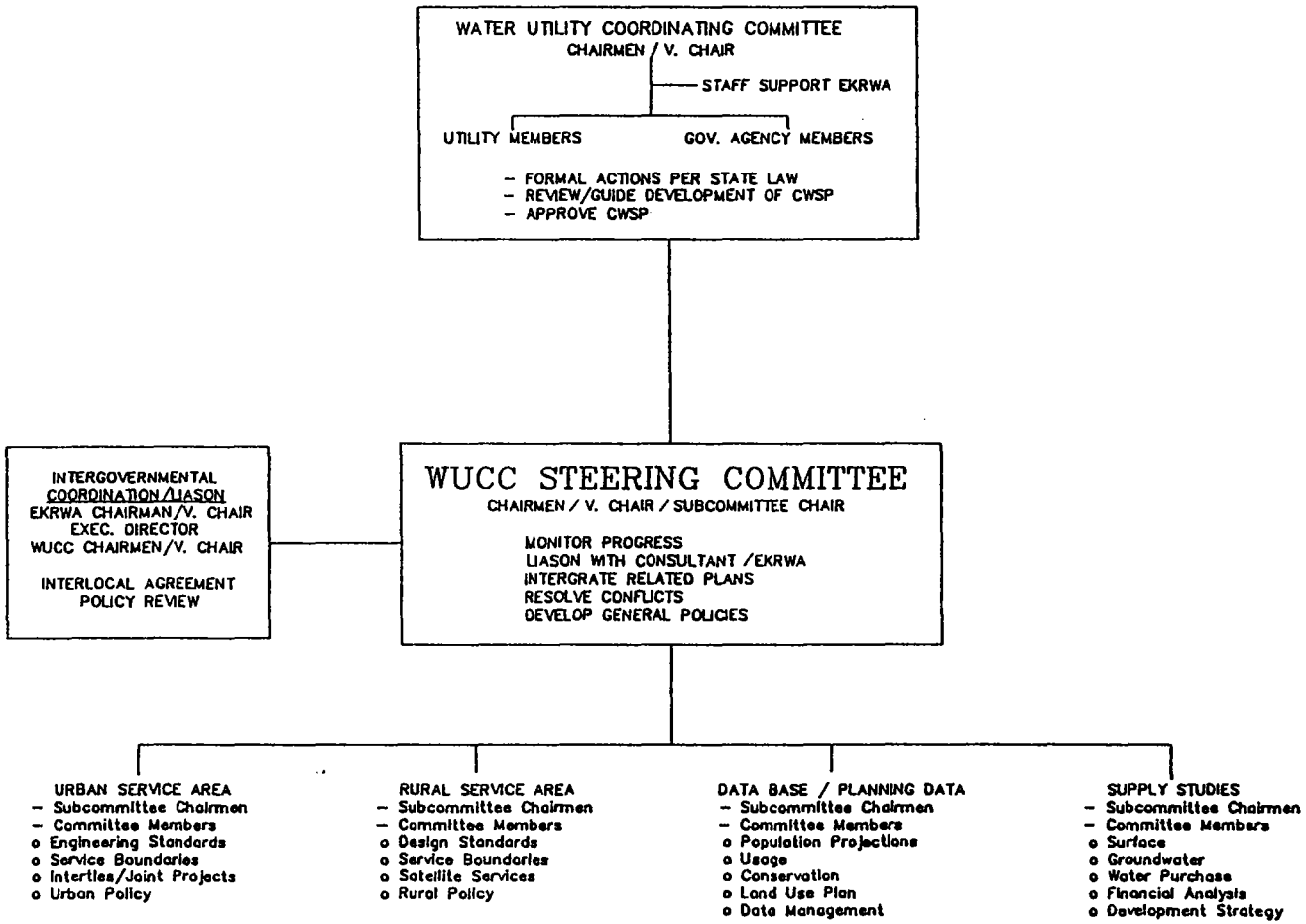


EXHIBIT II-3

WUCC WORKING ORGANIZATION

AUGUST 1987



ECONOMIC AND ENGINEERING SERVICES, INC.

EXHIBIT II-4

DATA BASE/PLANNING DATA SUBCOMMITTEE

SUBCOMMITTEE MEMBERS

Mr. Don Ellis
East King County Regional
Water Association

Mr. Geoff Ethelston
City of Bellevue

Mr. Michael Quinn
King County

Ms. Jay Regenstreif
Sammamish Plateau W&S District

Mr. Steve Schommer
NE Lake Washington W&S District

Mr. Bill Skahan, Chairperson
Rose Hill Water & Sewer District

Mr. Tim Skeel
Seattle Water Department

Mr. Ray Sturtz
City of Redmond

EXHIBIT II-4

RURAL SERVICE AREA SUBCOMMITTEE

SUBCOMMITTEE MEMBERS

Mr. Roy O. Bemis
Avon Villa Mobile Home Park

Ms. Carolyn Boatsman
SKC Public Health

Mr. Tom Brice
Water District No. 127

Mr. Mark Cassell
Redmond Water Dept.

Mr. Don Ellis
East King County Regional
Water Association

Mr. David Feltman
King County BALD

Mr. Steve Gilbert
City of North Bend

Mr. William Jennings
Ames Lake Water Association

Mr. Renny Lillejord
L&R Systems, Inc.

Mr. Chuck Lyon
King County Water District No. 119

Ms. J. J. McCament
Weyerhaeuser Real Estate

Mr. Ethan Moseng
DSHS-NW Regional Office

Mr. Gerald Prior, Chairperson
Sallal Water Association

Mr. Dennis Rash
Wilderness Rim Maint. Assn.

Mr. Jerry Venera
North Bend Fire Dept.

EXHIBIT II-4

SUPPLY STUDIES SUBCOMMITTEE

SUBCOMMITTEE MEMBERS

Mr. Bob Bandarra, Chairperson
City of Redmond

Ms. Carolyn Boatsman
SKC Health Department

Mr. Eugene Hofmann
City of Bellevue

Mr. Ron Little
Lake Sammamish Plateau W&S

Mr. Dave Parkinson
Seattle Water Department

Mr. Richard Peterson
NE Sammamish S&W District

Mr. John Phillips
Union Hill Water Association

Mr. Richard Rodriguez
King County BALD

Mr. Don Ellis
East King County Regional
Water Association

Mr. Rod Sakrison
Department of Ecology

Mr. Mark Spahr
Mr. Bret Heath
City of Issaquah

EXHIBIT II-4

URBAN SERVICE AREA SUBCOMMITTEE

SUBCOMMITTEE MEMBERS

Ms. Carolyn Boatsman
SKC Public Health

Mr. Bob Chute, Chairperson
King County Water Dist. No. 42

Mr. Eli Deberry
NE Lake Washington W&S

Mr. Don Ellis
East King County Regional
Water Association

Mr. Richard Rodriguez
King County BALD

Mr. Wes Jorgenson
City of Bellevue

Mr. Ethan Moseng
DSHS-NW Regional Office

Mr. John Phillips
Union Hill Water Association

Mr. Al Ryan
Sammamish Plateau W&S District

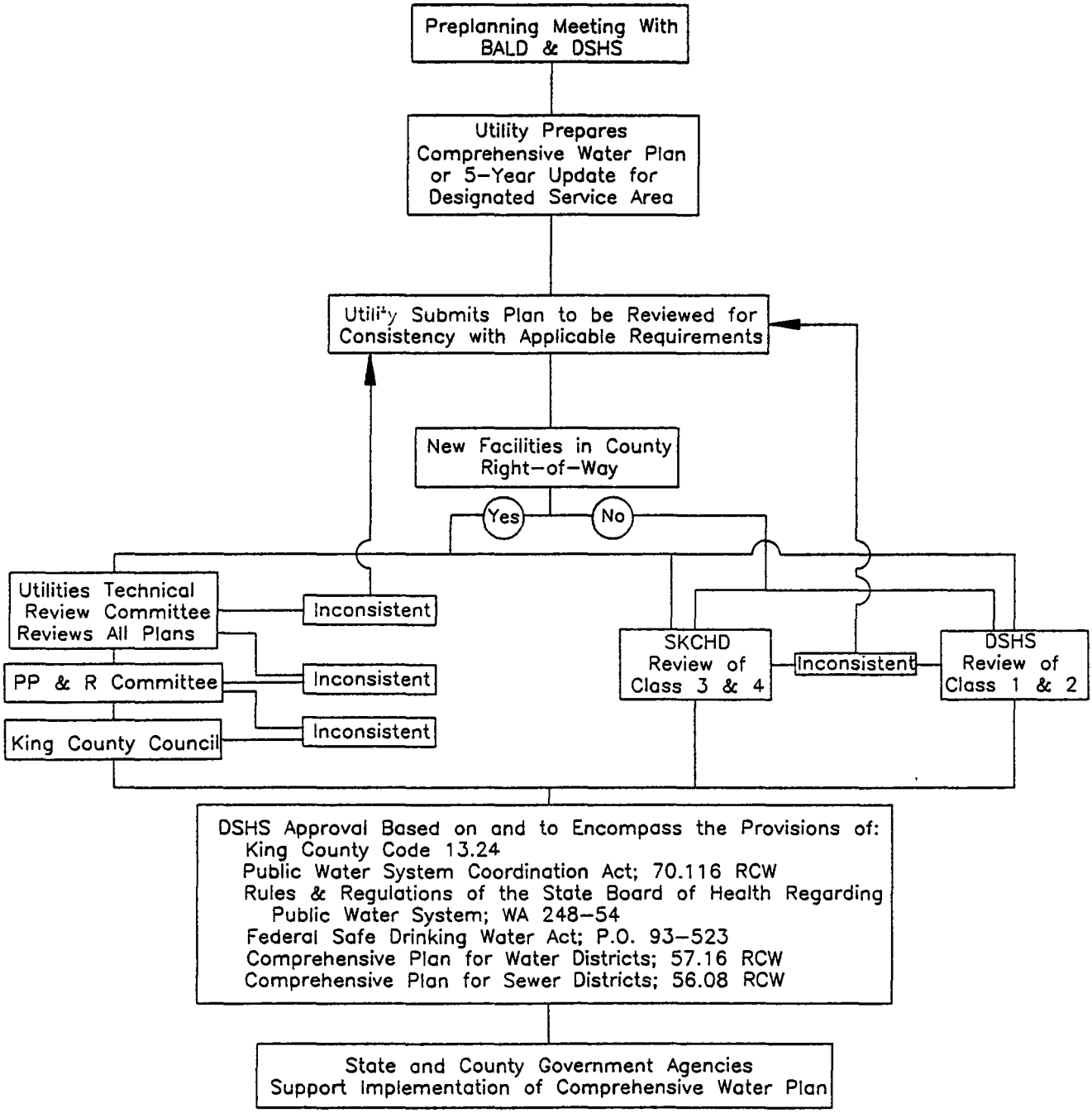
Mr. Mark Spahr
Mr. Bret Heath
City of Issaquah

Mr. Scott Thomasson
City of Redmond

Mr. Stuart Turner
City of Kirkland

EXHIBIT II-5

EAST KING COUNTY CWSP
COMPREHENSIVE WATER PLAN REVIEW PROCEDURE



ECONOMIC AND ENGINEERING SERVICES, INC.

SECTION III

SECTION III

WATER UTILITY SERVICE AREAS

1. INTRODUCTION

The Public Water System Coordination Act requires that a procedure be established to identify the existing and future service areas of public water utilities within the Critical Water Supply Service Area (CWSSA).

Two obligations accompany the establishment of service area boundaries. The first obligation is that the County and State governments recognize an identified utility as the responsible agency for providing all public water service within a designated area. The second obligation is that the utility shall assume responsibility, within its service area, for planning and implementing water system development and proper utility management. The manner in which this responsibility is to be fulfilled is to be described in the utility's water system plan. For those areas within the CWSSA which are not within any utility's designated service area, the Utility Service Review Procedure (USRP), gives priority to service by an adjacent utility with an approved water system plan or a Satellite System Management Agency (SSMA). If neither of these service options is available a new utility may be formed.

The Coordination Act provides the legal mechanism, for municipalities and private water utilities alike, to establish an exclusive service area within the unincorporated County areas. This procedure provides the utilities with the assurance that their planning, capital improvement programs, and financial commitments are consistent with State and County requirements.

From the County's perspective, designated service areas will mean a specific utility has accepted responsibility for development of cost-effective and efficient service to accommodate the future growth that these areas will experience. Growth management objectives established for these areas by the County's Comprehensive and Community Plans must be accounted for in each utility's approved plan and actual improvements.

The Coordination Act requires that service area boundaries be established by agreement among the purveyors based on a variety of factors. These factors include: topography, readiness and ability to serve, local franchise areas, legal water system or municipal boundaries, future population projections, and sewer service areas. It also specifies that these service areas be developed in conformance with the land use policies of the County.

2. SERVICE AREA COMMITMENTS AND PROCEDURES

The designated service area defines the area within which all future customers will be provided retail water service by the designated utility. An important distinction is that a utility's water facilities, such as sources of supply and reservoirs, can be located outside the utility's future service area. These facilities can be located within another utility's retail service area; provided the facilities are not used for direct retail service without the written concurrence of the designated utility.

Once adopted as part of this Coordinated Water System Plan (CWSP), the designated service area will be the exclusive service area of the identified utility. As a condition of being granted a designated service area, the utility shall meet certain obligations and commitments, as described in the following:

A. Water System Plan and Service Area Agreement

Each utility, including an SSMA, is required to prepare and submit to the County and/or the Department of Social and Health Services (DSHS) a water system plan within 1 year of the date the CWSP is presented to the County for review. The plan must identify service area boundaries. During the pendency of the 1 year planning period, those utilities having signed service area agreements as a part of the CWSP, will have exclusive rights to the service area described in the agreement. Utilities not signing an agreement will have exclusive rights only to their existing service areas. In this latter case, service outside of the utilities existing service area may be assigned, according to the USRP, as though located in an undesignated area.

Once a water system plan is approved and service area agreements are in effect, the service area will be assigned to that utility. If, at any time, the Department of Social and Health Services (DSHS) determines the utility has failed to comply with the standards or provisions of its water system plan, the designated service area may be revised or revoked based on the test of timeliness and reasonableness.

B. Conditions of Service by Designated Utility

Water service can be provided by the designated utility either through direct connection to the utility's existing water system, or as a detached, remote system managed by the utility or others through agreement. In either case, the utility will identify for the applicant all of the conditions of service which must be agreed to prior to the provision of water service. The Coordination Act requires that the utility be willing to extend service in a timely and reasonable manner. Once the applicant agrees to these conditions, a building permit or preliminary plat approval can be issued.

C. Interim Service Agreements

A utility may receive a request for service within its designated service area and may not be able to provide immediate service. If this occurs, interim services by an adjacent utility, an SSMA, or the developer/ homeowner association may be allowed by the designated utility. Service may be provided either through physical connection to an adjacent utility's system or installation of a detached, remote system. The appropriate level of services should be stipulated in a written agreement. The general content of such an agreement is described and discussed in Section VI, Satellite System Management Program. Service area adjustments are not required for provision of interim services.

D. Service Area Adjustment

In the future, if a utility determines that its service area is either too large or too small, the service area boundaries may be revised at any time. However, this will require the signing of revised service area agreements by all affected purveyors. Such revisions and agreements shall be approved, following the same procedures as adoption of the CWSP, and be filed with the Building and Land Development Division (BALD) for incorporation in the official CWSP file.

This CWSP must be reviewed by the Water Utility Coordinating Committee (WUCC) at a minimum of every 5 years and updated as necessary. Service areas adopted in this Plan may also be revised at that time, if such revisions are considered appropriate by the utilities concerned.

3. SERVICE AREA SELECTION PROCESS

The Public Water System Coordination Act specifies that no new public water systems be created after the boundaries of the CWSSA are established unless an existing system is unable or unwilling to provide service. Therefore, existing systems had to be identified and contacted to establish their existing and anticipated future service areas. All undesignated land is served as prescribed by the USRP which is described in Section V.

For purposes of clarifying who should be contacted, the WUCC agreed that an existing system should include any Class 1, 2, 3, or 4 water system, as defined by WAC 248-54-015, which met one of the following definitions:

- An existing approved water supply system: A water supply system which has had plans and specifications approved by either DSHS or Seattle-King County Health Department (SKCHD), has been physically installed, and has received a certificate of completion from the system engineer or designer.

- An existing unapproved water supply system: A water supply system which has been physically installed without approval of plans and specifications by either DSHS or SKCHD. Any request for service connection to an unapproved water system will be subject to the water system complying with appropriate DSHS (WAC 248-54) and/or SKCHD (Rules and Regulations No. 9) regulations.

- An approved water system in the planning or construction stages: A water supply system with approved plans, dated prior to September 17, 1987, from DSHS or SKCHD, which have not expired but the system installation has not been started or completed at this time.

- An approved proposed water system: A proposed water supply system having a completed and approved source site inspection on record, prior to September 17, 1987, which has not expired, including site inspections performed as part of a short or formal subdivision.

All Class 1 and 2 utilities were contacted by letter. They were asked to verify their existing service area, as well as provide boundaries depicting their anticipated future service area. Over 900 Class 3 and 4 systems (including pending applications) were also contacted by letter from the SKCHD to identify expanding systems and the location of their future service area. Expanding Class 3 and 4 systems were not considered to be those adding additional customers up to a pre-approved limit. However, adding customers beyond an approved limit or enlarging the geographic area of service was considered expansion. Twenty Class 4 purveyors, and 14 with pending applications, indicated their intent to expand. Utilities not responding were assumed to have no desire for expansion.

Service areas for all Class 1 and 2 systems were computerized using AutoCAD Version 10 onto a master set of reproducible maps. In addition, a computerized map was developed from data provided by SKCHD showing the location to the nearest quarter-quarter section of all Class 3 and 4 systems and systems with pending applications. Exhibit III-1 generally shows the service areas for Class 1 and 2 utilities. The service area maps and all AutoCAD data disks are incorporated into the CWSP by reference in Appendix D, and are on file with BALD. A complete listing of the Class 3, 4, and pending application systems is contained in Appendix E. Data regarding these systems are on file at the SKCHD.

4. SERVICE AREA AGREEMENTS

An Service Area Agreement (Agreement) was drafted and approved by the WUCC and forwarded to the utilities for signature along with final copies of their future service area maps. A copy of the Agreement is included herewith as Exhibit III-2. Signed Agreements are included in Appendix D.

Establishment of individual Agreements among all water systems in the study area is extremely cumbersome. Therefore, the Agreement was used to allow the utility to agree with the boundary of its service area as it is shown on the official County map. In so doing, the utility acknowledges adjacent utility boundaries also shown on this map, and thus avoids entering into separate agreements with each adjacent utility.

Where understandings concerning joint service, transfer of service, or common boundaries require more specific terms than are provided in the Agreement, the affected utilities are to document the specific conditions in an attachment to the Agreement. In order for these understandings to be recognized in implementing the CWSP, the utilities must place them on file with BALD as an attachment to the Agreement.

To confirm designated service areas and establish their legal service boundary, all expanding water utilities must complete the Agreement and submit it to BALD. Each Agreement will be reviewed in conjunction with individual water system plans.

Unless a documented health-related problem is involved, failure to submit an Agreement should result in denial of proposed system expansions within the service area. For utilities with unresolved service area conflicts, this denial should be limited to proposed activities within the contested service area.

A special process was followed in recognizing expanding Class 3, 4, and pending applications. As described above in this Section, the SKCHD identified 34 small systems that indicated an intent to expand their service areas. These systems were located in relation to the future service area boundaries of the larger (Class 1 and 2) utilities. In consultation with the WUCC, the SKCHD notified individual larger utilities of those expanding smaller systems that were located within their service areas. A response time was fixed for the larger utilities to review the expansion plans of the smaller utilities and to advise SKCHD of any concerns or objections. No objections were received. This status was reported by SKCHD to the WUCC. By motion, second, and unanimous vote, the WUCC recognized the intent of the 34 small systems to expand as a valid element of the CWSP. Exhibit III-3 is a listing of the 34 systems and the service area in which they are located.

These existing Class 3 and 4 systems that had planned for service area expansion but did not document their intention through the CWSP preparation process are not precluded from seeking such recognition in the future. This could be accomplished through participation in the 5-year CWSP Update process or, in the interim, through an appropriate request to BALD. Any such request should include documentation that the utility's expansion plans are consistent with the objectives of the CWSP.

Recognition of utility service areas and Agreements by the County shall be incorporated into the County franchise review process. If the standards of KCC 6.27 are met, the existing franchise boundaries can be revised to coincide with the designated water service area boundaries of the CWSP. Also, the Boundary Review Board should be notified of those utilities who have signed Service Area Agreements, of the service area boundary of each such utility, and be requested to recognize these boundaries in the conduct of Boundary Review Board responsibilities.

5. UNRESOLVED SERVICE AREAS

One service area dispute exists at the time of preparation of the CWSP Regional Supplement. This dispute involves the City of Redmond and the Union Hill Water Association. The area in conflict is shown in Exhibit III-4. The WUCC has referred this issue to DSHS for resolution pursuant to RCW 70.116.070.

6. SERVICE AREA BOUNDARY CHANGE PROCEDURE

Changes in utility service area boundaries will occur when two utilities wish to expand or reduce their service areas. These will be approved only if a conflict in service areas is not created by the modification.

A revised Service Area Agreement will be required of utilities requesting boundary changes. The BALD and the WUCC will review and approve all requested adjustments in service area boundaries to ensure that utility service is consistent with the CWSP objectives. The BALD will maintain and incorporate all approved boundary changes on the County's official service area maps, and forward these changes to DSHS and other appropriate County agencies. These boundary changes will be integrated into the USRP described in Section V.

The realignment of service area boundaries will require an amendment to the utility's water system plan when the plan is updated every 5 years.

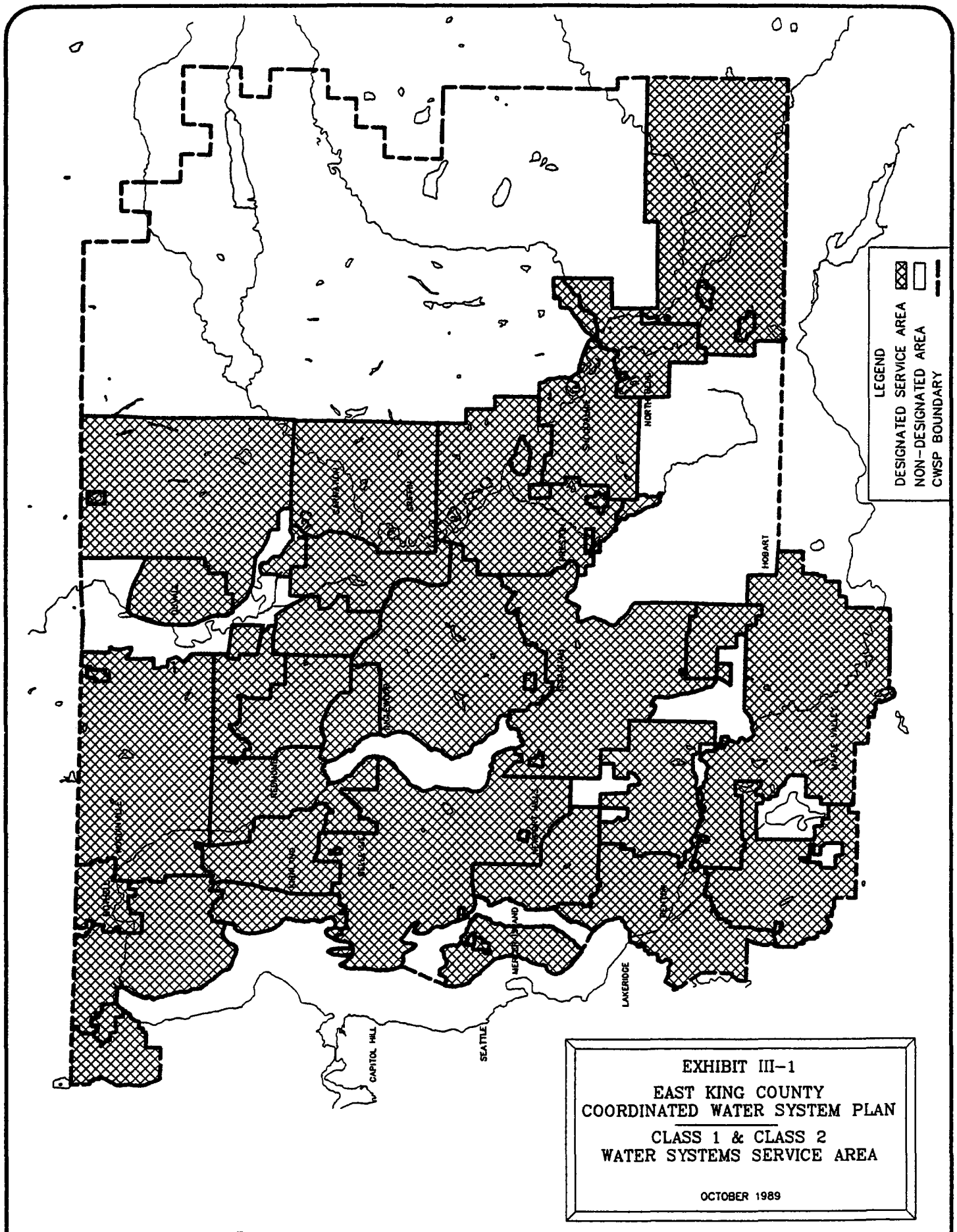


EXHIBIT III-1

EAST KING COUNTY
COORDINATED WATER SYSTEM PLAN

CLASS 1 & CLASS 2
WATER SYSTEMS SERVICE AREA

OCTOBER 1989

EXHIBIT III-2

AGREEMENT
FOR ESTABLISHING WATER UTILITY SERVICE AREA BOUNDARIES AS IDENTIFIED BY THE EAST KING COUNTY COORDINATED WATER SYSTEM PLAN

PREAMBLE

The Agreement for the water utility service area boundary identifies the external boundary of the service area for which the designated water purveyor has assumed direct retail water service responsibility. The responsibilities accepted by the water purveyor are outlined in the East King County Coordinated Water System Plan (CWSP), and as defined by the adopted rules and regulations of the Department of Social and Health Services (DSHS). This agreement does not give new authorities or responsibilities to the water purveyor or to the County or State regulatory agencies, but rather acknowledges the geographical area for these designated service responsibilities.

The terms used within this Agreement shall be as defined in the implementing regulations of Chapter 70.116 RCW, except as identified below.

1. East King County Critical Water Supply Service Area Map shall mean the map referenced in the Agreement as Attachment A for the retail service area, except as amended in accordance with the CWSP procedures and with the concurrence of the affected water purveyors.

2. Retail Service Area shall mean the designated geographical area in which a purveyor shall supply water either by direct connection, by a satellite system, or through interim service by an adjacent utility or Satellite System Management Agency under agreement with the designated utility.

3. Wholesale Service Area shall mean the designated geographical area in which a purveyor, a group of purveyors, or another organization provides water to other water purveyors on a wholesale basis. A wholesale water supplier shall not provide water to individual customers in another purveyor's retail service area except with the concurrence of the purveyor responsible for the geographical area in question.

4. Lead Agency for administering the Agreement For Establishing Water Utility Service Area Boundaries shall be the King County Parks, Planning, and Resources Department, Building and Land Development Division, unless otherwise established by amendment to the CWSP.

The authority for this Agreement is granted by the Public Water System Coordination Act of 1977, Chapter 70.116 RCW.

WHEREAS, Such an Agreement is required in WAC 248-56-730, Service Area Agreements-Requirement, of the Public Water System Coordination Act; and

WHEREAS, Designation of retail water service areas, together with the cooperation of utilities, will help assure that time, effort, and money are best used by avoiding unnecessary duplication of service; and

WHEREAS, Definite future service areas will facilitate efficient planning for, and provision of, water system improvements within East King County as growth occurs; and

WHEREAS, Definite retail and wholesale service areas will help assure that water reserved for public water supply purposes within East King County will be utilized in the future in an efficiently planned manner,

NOW, THEREFORE, the undersigned party, having entered into this Agreement by signature of its authorized representative, concurs with and will abide by the following provisions:

Section 1. Service Area Boundaries. The undersigned party acknowledges that the East King County Critical Water Supply Service Area Map, included as Attachment A to this Agreement and as may be subsequently updated, identifies the utility's future water service area. The undersigned further acknowledges that there are no service area conflicts with adjacent water utilities, or, where such conflicts exist, agrees that no new water service will be extended within disputed areas until such conflicts are resolved.

Section 2. Common Service Area Transfer. It is understood that utilities may initially continue existing water service within the boundaries of neighboring utilities, as defined in Section 1 hereof. Such common service areas, if they exist, are described in Attachment B to this agreement. Also included in Attachment B are copies of, or a list of, all resolutions, ordinances, or agreements enabling these uncontested overlays. The undersigned party agrees that any water line for retail service extending outside of the retail service area boundary, as set forth in Section 1, shall be phased out and service transferred to the designated adjacent utility on an economic basis or by mutual agreement.

Economic basis considerations may include, but are not limited to:

(a) A determination by the present owner of service lines that maintenance, repair, and/or replacement costs exceed attributable income.

(b) Planned or imminent major street improvements or major improvements to either or both water systems which include an opportunity to transfer service.

The terms of the transfer of service area described in this Section shall be established in a separate agreement among the adjacent utilities whose boundaries are affected.

Section 3. Boundary Streets. Unless separate agreements exist with adjacent utilities concerning water services or other utility services, this party agrees that the water utility which is located to the north and/or east of boundary streets between this party and adjacent utilities will be entitled to provide future water service on both sides of those streets. Depth of service on boundary streets shall be limited to one platted lot or as otherwise agreed by the utilities. Existing services on boundary streets shall remain as connected unless transfer of service is agreed to by both parties, as per Section 2. These provisions do not disallow the placement of mains in the same street by adjacent utilities where geographic or economic constraints require such placement for the hydraulic benefit of both utilities.

Section 4. Boundary Adjustments. If, at some time in the future it is appropriate for the undersigned party to make service area boundary adjustments, such modifications must receive written concurrence (which shall not be unreasonably withheld) of all utilities that would be directly affected by such a boundary adjustment and the proper legislative authority(ies). This provision does not apply where boundary adjustments are made as a result of municipal annexations or incorporations, nor is it intended to modify the provisions of state law. These written modifications must be noted and filed with the designated King County lead agency and DSHS. It is understood by the undersigned party that if, as provided by RCW 70.116.040, it is unable to provide service within its designated service area boundary it may decline to do so. But, in that case, an applicant may be referred to other adjacent utilities, to a pre-qualified Satellite System Management Agency (SSMA), or a new utility may be created and the original service area boundary will be adjusted accordingly.

Section 5. Service Extension Policies. The undersigned party agrees that in order to expand its water service area, other than by addition of retail customers to existing water mains, or to serve in the capacity of a pre-qualified SSMA, it shall have adopted design standards and Utility Service extension policies. The design standards shall meet or exceed the East King County Minimum Design Standards.

Municipalities further agree that if they identify a service area outside of their existing municipal corporate boundaries, the municipality will assume full responsibility for providing water service equivalent to (excluding rates and charges) the level of service provided for their inside-city customers. This will be in conformance with applicable land use policies.

This agreement by reference includes the following attachments:

Attachment A - East King County Critical Water Supply Service Area Map. (see Section 1)

Attachment B - Common Service Area Agreement - Optional - Utility may attach copies or list such agreements if relevant. (see Section 2)

IN WITNESS WHEREOF, the undersigned party has executed this Agreement as of _____.

_____
Water Utility

_____
Representative

_____
Title

Receipt Acknowledged:

_____ _____
King County Parks, Planning, and Resource Department — Date

EXHIBIT III-3

SMALL SYSTEMS WITH EXPANDING SERVICE AREAS

System Name	Class	ID No. (1)	Location				Existing Connections	Future Connections
			Sub.	Sec.	Twp.	Rge.		
Carnation Service Area								
Tolt River Estates	0 (2)	--	NE SW	14	25N	07E	6	9
Cedar River Service Area								
Corbin, P.	4	14940F	SE SW	35	23N	06E	5	7
Goodsell, D.	4	--	SE SE	11	22N	06E	1	3
Lemon, R.	4	21890F	NE NW	33	23N	06E	3	9
Strand, J.	0	--	SW SE	03	23N	06E	2	
Ulrich, J.	0	--	SE NE	36	23N	06E	7	99
Issaquah Service Area								
Hoffman	4	24827F	NE SW	14	23N	06E	5	9
Hale, R.	4	29715C	NE SW	15	23N	06E	2	8
Oxley	4	23241-2	NW NW	15	23N	06E	2	3
Park Place	4	66140Q	SE NE	03	23N	06E	9	15
Pierce/Johnson	4	67303K	SW NE	15	23N	06E	4	7
Grothear/Weckwerth	4	090266	SW SW	19	24N	07E	4	8
Preble, R.	0	--	NE SE	18	24N	07E	6	
Satterthwaite, D.	0	--	SE SW	30	24N	07E	4	
KCWD No. 119 Service Area								
Brammer	4	245632	NW NW	16	26N	07E	4	9
Nielsen Duvall	0	--	NE SE	22	26N	07E	2	3
Waddington, W.	0	--	NE NE	16	26N	07E	2	7

EXHIBIT III-3 continued

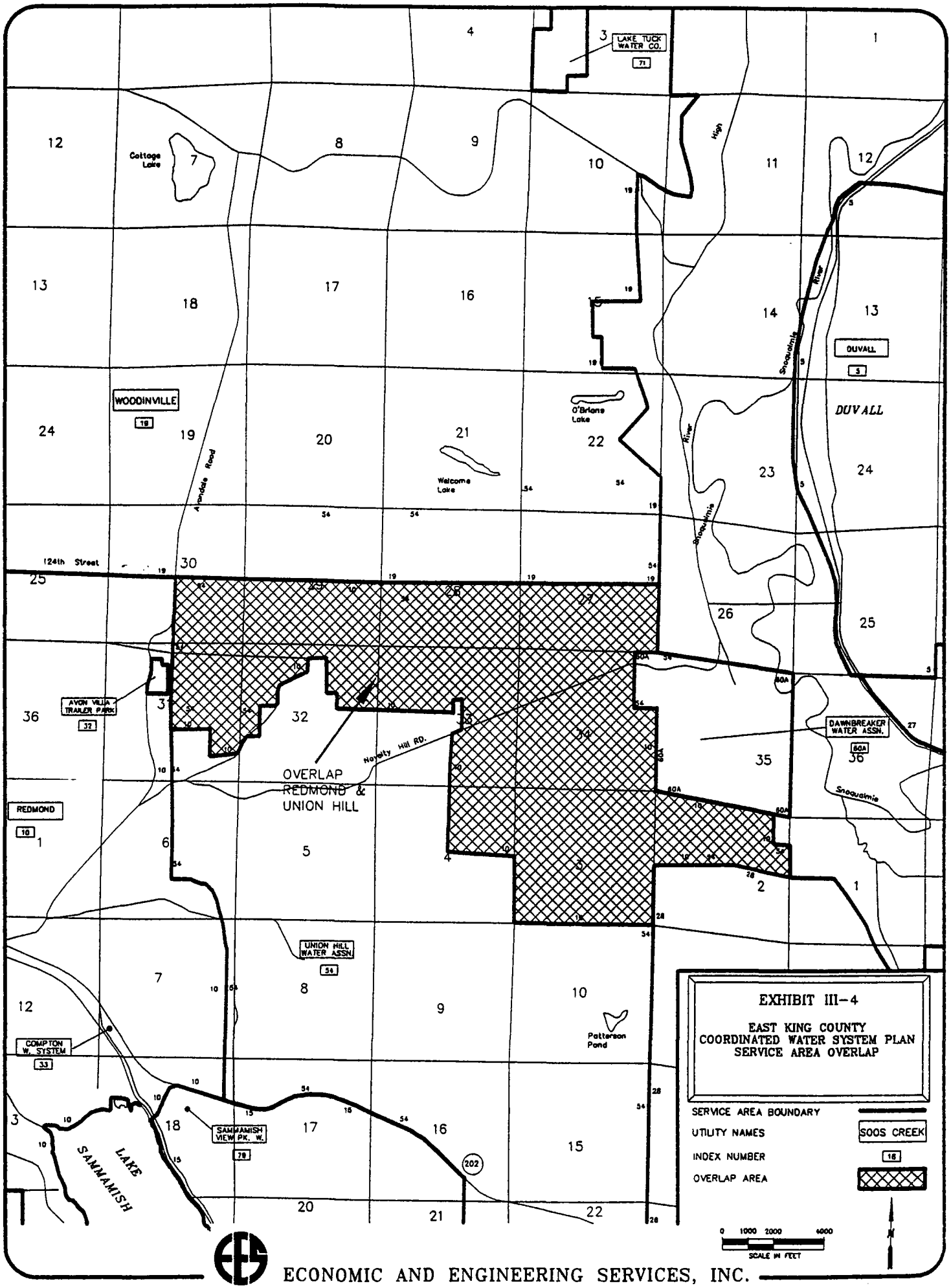
System Name	Class	ID No. (1)	Location				Existing Connections	Future Connections
			Sub.	Sec.	Twp.	Rge.		
KCWD No. 127 Service Area								
Lake Alice No. 1	4	21864R	SW SW	26	24N	07E	5	8
Jung/Oestreich	0	--	NE NE	24	24N	07E	20	25
Reed, B.	0	--	SE	27	24N	07E	2	3
Mirrormont Service Area								
Hansen, G.	4	422011	SE NE	26	23N	06E	3	6
Ulrich, J.	0	--	SE NE	36	23N	06E	7	99
North Bend Service Area								
Davis-North Bend	4	70030	NW NW	15	23N	08E	6	7
NE Sammamish Service Area								
Sutherland, G.	4	01271M	SW NW	20	25N	06E	2	9
Hughes, W.	0	--		20	25N	06E	2	6
Redmond Service Area								
Stern, W.	4	01226X	NW NW	31	26N	06E	4	7
Sallal Service Area								
Middle Fork Woodlands	4	081751	NW NE	20	23N	09E	9	20
Sammamish Plateau Service Area								
Caldwell Community	4	23351E	NW SE	14	24N	06E	3	9
Dillon/McLaughlin	4	00732P	SE NE	14	24N	06E	2	10
Stockholm, J.	0	--	SW NE	18	24N	07E	4	

EXHIBIT III-3 continued

System Name	Class	ID No. (1)	Location				Existing Connections	Future Connections
			Sub.	Sec.	Twp.	Rge.		
Woodinville Service Area								
Maxfield/Cranshaw	4	37944T	SE NW	30	26N	06E	2	4
Keesling, M.	0	--	NW NE	10	26N	06E	4	5
Undesignated Service Area								
Ballard Community	4	35426J	NW NE	01	23N	05E	8	
Lenser, H.	0	--	NE NE	01	23N	05E	4	9
Novelty Hill Estates	0	--	SW NW	26	26N	06E	8	20

Footnotes:

(1) Department of Social and Health Services Identification Number.
(2) Class "0" is the designation applied by the Seattle-King County Health Department to systems with applications pending approval.


LAKE TUCK WATER CO.
71
Cottage Lake
WOODINVILLE
19
Avondale Road
O'Brians Lake
Welcome Lake
124th Street
DUVALL
5
Snoqualmie River
AVON VILLA TRAILER PARK
32
OVERLAP
REDMOND &
UNION HILL
Novelty Hill RD.
DAWNBREAKER WATER ASSN.
60A
REDMOND
10
UNION HILL WATER ASSN.
34
COMPTON W. SYSTEM
33
SAMMAMISH VIEW PK. W.
70
LAKE SAMMAMISH
Patterson Pond
202
EXHIBIT III-4
EAST KING COUNTY
COORDINATED WATER SYSTEM PLAN
SERVICE AREA OVERLAP
SERVICE AREA BOUNDARY
UTILITY NAMES
SOOS CREEK
INDEX NUMBER
16
OVERLAP AREA
0 1000 2000 4000
SCALE IN FEET
N

SECTION IV

SECTION IV

WATER UTILITY DESIGN STANDARDS

1. INTRODUCTION

A primary objective of the Coordinated Water System Plan (CWSP) is to develop minimum design and performance criteria for the water utilities in East King County. The Rural and Urban Service Area Subcommittees of the East King County Water Utilities Coordinating Committee (WUCC) prepared a draft Minimum Design Standards document. These draft standards were reviewed by the Steering Committee, which in turn formed a special task force with representations of the South King County WUCC to promote consistency. Several meetings were held with representatives of other Regional Water Association (RWA)/WUCC committees as well as County staff to facilitate the development of a uniform set of standards which accommodated differing concerns in local areas. This Section presents the engineering and construction design criteria which resulted from these discussions and which were uniformly adopted by the South King and East King WUCCs to achieve the overall objectives of the CWSP.

2. MINIMUM DESIGN STANDARDS

Standardized design and performance criteria are essential for establishing a common set of standards which apply to and set a base level of utility planning, design, and construction for all public water utilities. Uniformity and consistency in standards will, in the long-term, reduce costs to customers as system interties and/or consolidation of utilities takes place. In addition, these standards, in conjunction with the Utility Service Review Procedure (USRP), will clarify the facility requirements and financial impacts of projects proposed by developers and water service applicants.

The Public Water System Coordination Act requires development of minimum standards applicable to water system improvements within a Critical Water Supply Service Area (CWSSA). The East King County Coordinated Water System Minimum Design Standards were developed to fulfill this requirement. These are minimum performance, design, and construction standards used to maintain uniformity of design between adjacent water utilities. Each purveyor, as a part of its water system plan, is required by WAC 248-54-105, to identify its design standards and specifications. By reference to these Minimum Design Standards, the intent of this requirement will be met.

A copy of these standards is shown in Exhibit IV-1 and is on file at the Building and Land Development Division (BALD) and the Seattle-King County Health Department (SKCHD) offices. These standards apply to all new and existing systems which install new capital facilities. Retroactive application of the standards is limited to their incorporation into system plans to replace existing facilities. Retroactive application is at the discretion of the water utility, unless necessary to meet minimum state health standards. Existing water systems are not required to utilize these minimum standards for repair of existing facilities.

The content of the standards is consistent with the Minimum Design Standards of the Department of Social and Health Services (DSHS) and Department of Ecology (Ecology). In addition, they adopt by reference the standards of the American Water Works Association (AWWA), the Washington State Department of Transportation/American Public Works Association (DOT/APWA), and other County rules, regulations, and ordinances. Other special source, design, material, and construction criteria are also listed.

Minimum standards for fire flow, flow duration, hydrant specifications, hydrant locations, and other fire protection measures were evaluated at great length by the WUCC and were jointly addressed with County staff. It was agreed that when fire protection is provided by a public water system, the conditions of service should be prescribed by these minimum standards in conjunction with City codes within their service areas and King County Code 17.08, as amended, for all other unincorporated areas. During this study various changes to Code 17.08 were proposed by the King County Fire Chiefs Association and were reviewed by the WUCC and King County.

In general, the requirements of King County Code 17.08 are more stringent than Chapter 248-57 WAC regarding fire flow requirements. There did appear to be some lack of interpretation of existing fire protection requirements and the required timing to install facilities, particularly in transitional areas. Therefore, the Minimum Design Standards have been prepared to correlate minimum fire flow requirements based upon land use planning documents, as prescribed by Chapter 248-57 WAC. In addition, an inquiry procedure is proposed wherein the County verifies the most current land use classifications, particularly in transitional areas, and provide this information to utilities before they prepare individual water system plans. In unincorporated County areas, the standards specify that where fire flow is from public water utilities, the distribution mains will be sized to provide a minimum of 1,000 gpm flows, or greater, if required. The installation of hydrants and reservoirs in rural and transitional areas can be scheduled to conform with individual comprehensive water system plans unless required sooner by King County.

The standards provide for a Standards Committee to review these standards on an annual basis, to monitor their application, and to evaluate their appropriateness to the conditions and needs that exist within East King County. The committee should also monitor the application of the standards by the regulatory agencies and the utilities to ensure that the objective of uniform minimum standards is achieved.

3. WAIVER PROCESS

A waiver process exists for circumstances where the minimum design standards create undue hardship. Outside designated service areas, a waiver may be obtained through the Appeals Process described in Section XI. In this instance, a waiver can only be granted to Class 4 systems located in rural land use areas where fire flows are not required.

Within designated service areas, the designated purveyor has the sole authority to allow the installation of facilities for remote systems which conform with DSHS standards but are less stringent than the East King County Minimum Design Standards. In this instance, lesser standards can only be granted to new systems with four or fewer service connections and where fire flow is not required. The acceptance of lesser standards should be noted on the Certificate of Water Availability by the designated utility and in its service area contract with the applicant. It is anticipated that this waiver will be utilized primarily when the proximity of a smaller system will benefit from larger, nearby facilities planned for future installation by the designated utility.

4. UTILITY STANDARDS

The standards established for East King County are considered to be minimum standards allowed for new and expanding water systems. It is not intended for these standards to also be interpreted as the largest or most stringent criteria. Some water utilities may consider these standards to be inadequate to meet the requirements of their service area. Therefore, a utility may adopt the minimum standards described herein or may adopt more stringent standards, provided such standards are not inconsistent with applicable land use plans or the conditions to exceed minimum design standards, as cited in Exhibit IV-1. They may not, however, reduce the County standards for new services, except as provided in the waiver process described above. If any water utility chooses to expand upon the minimum standards, they are encouraged to coordinate the development of their utility standards with adjacent systems to promote consistency throughout the County.

The DSHS approval procedure for water system plans encourages the development of standard construction specifications by the water utility. By referring to these adopted Minimum Design Standards, which include both APWAs and AWWAs standard construction specifications, the State requirements are fulfilled. This, however, also places the water utility under the obligation to use these as minimum construction standards, unless amended.

EXHIBIT IV-1

EAST KING COUNTY
COORDINATED WATER SYSTEM PLAN

MINIMUM DESIGN STANDARDS

1. INTRODUCTION

This Section of the Coordinated Water System Plan (CWSP) provides a set of minimum design standards and incorporates performance specifications, where applicable, for new and existing water utilities which are planning to install new capital facilities in King County. Subsection 3 describes the manner in which the specifications are to be applied to water utility planning and construction. Since other legally constituted standards which are more stringent are not superceded, the primary, currently existing, and applicable standards are listed and incorporated by reference in Subsection 4. The design standards are described in Subsection 5.

2. PURPOSE

The purpose of these standards is to set a base level of utility planning, design, and construction for public water utilities. Uniformity and consistency in standards will, in the long-term, reduce costs to consumers as system interties and/or consolidation of utilities takes place. Reliability of water supply will also be improved.

Subject to certain exceptions, each utility, including municipalities, is to adopt design standards as a part of its water system plan. It is intended that a utility may adopt the minimum design standards described herein or may adopt higher standards, provided such standards are not inconsistent with applicable land use plans.

3. APPLICATION OF STANDARDS

A. Existing Water Systems

Existing water systems are not required to apply these minimum standards for repair or replacement of existing facilities unless the replacement is associated with providing expanded service due to new developments. Adherence to these standards for repair of facilities is encouraged to provide better public water service throughout the County. When system replacement occurs, the design should be based on the utility's long-term water system planning design criteria.

B. City Water Systems

The minimum design standards described herein do not apply to cities insofar as service within municipal boundaries is concerned. However, it is expected that cities will adopt, or have adopted, design standards at least equal to those herein. If cities extend new water service to customers outside of the city limits, the design standards adopted by the municipality for outside city service must at least meet the minimum design standards described in this document.

C. Water System Plans and Applicable Land Use Plans

New and expanding utilities shall meet water system planning requirements using land use designations for their service area as prescribed in the King County Comprehensive Plan, Community Plan, Zoning Code, and any related interlocal agreements. Approved land use activities in the service area shall be designated by the King County Parks, Planning, and Resources Department (County). Such designations shall be identified in the utility's Water System Plan, and shall be used to establish design requirements.

The utility shall prepare a water system plan and a program of capital improvements required to provide the anticipated level of service within their designated water service area, consistent with the land use plan. When the utility is requested to provide water service, it will identify that portion of planned capital facilities as well as other installations which are necessary to provide the service requested. As growth occurs, the full level of water service will eventually be provided throughout the service area of the utility in a planned, phased program which meets County requirements and minimizes overall cost to the customers.

In areas defined as Urban by the County, the utility shall install a distribution system with a minimum pipe size of 8 inches. The installation schedule for fire hydrants and storage will be based on the designated water utilities' water system plan and the fire flow requirements established by the County Fire Marshall.

For areas defined as Transitional and Rural, the minimum pipe size shall be 6 inches, except as provided in Section 5.B(2). The installation of hydrants and storage will be based on the requirements of the County Fire Marshall.

The designated water utilities, prior to their 5-year update of their Water System Plan, shall request the County to verify the current land use designation and planning projections. Based on the projections, the utility will establish the design criteria necessary to meet the land use and

fire flow requirements. This design criteria will be used to plan for hydrants and storage to meet anticipated fire flow requirements for future development. If the County does not respond in writing within 30 days, the utility shall use the then current County Comprehensive Plan and Community Plan.

D. Conditions to Exceed Minimum Design Standards

Minimum standards represent the lowest or least level of design allowed. Water service needs, as defined by a utility's approved water system plan and sound engineering and design practices, frequently require a higher level of service than can be achieved under the minimum standards. In the following instances, design standards will be allowed to exceed the minimums.

(1) When it is necessary to adequately serve Rural Activity Centers, Rural Neighborhood Centers, Urban Activity Centers, or Urban Areas;

(2) When it is necessary to provide transmission between a water source or storage facility to a distribution system of a utility and/or a Satellite System or an intertie with another utility;

(3) When it is necessary to address existing quantity or quality problems within any area currently authorized to receive water service;

(4) When it is necessary to meet health and safety guidelines of the County's applicable fire protection ordinances or another minimum design standard.

4. STANDARDS INCORPORATED BY REFERENCE

The existing standards listed below, or as may be modified by the appropriate authorities, are hereby incorporated by reference. Priority for application of these standards is in the order listed, but the most stringent applies. Except as otherwise superceded by the County standards described herein, these standards will apply to water system design, installation, modification, and operation.

- Rules and Regulations of the State Board of Health Regarding Public Water Systems.
- Applicable County rules, regulations, ordinances, and standards.
- Standard Specifications for Road, Bridge, and Municipal Construction, as published by the Washington State Department of Transportation/ American Public Works Association (DOT/APWA), latest edition.

o Standards of the American Water Works Association.

5. MINIMUM STANDARDS

A. General Provisions

(1) Source Development

New sources must be designed to meet the Department of Ecology (Ecology), the Department of Social and Health Services (DSHS), and the Seattle-King County Department of Public Health (SKCDPH) regulations and design guideline. These include: Chapter 173-160 WAC, Minimum Standards for Construction and Maintenance of Water Wells, as administered by Ecology; Chapter 248-54 WAC, "Rules and Regulations of the State Board of Health Regarding Public Water System", as administered by DSHS; and, "King County Board of Health, Title 12," as administered by the SKCDPH.

All test and production wells must be drilled in accordance with detailed drilling and testing specifications, which have either been prepared by, or received prior approval of the designated utility, if the well is to be used for a public water supply. These specifications may not be less stringent than those identified in the references cited in the above paragraph.

(2) Water Rights

Water rights must be obtained in accordance with Ecology regulations and procedures. Copies of water rights documents, correspondence, and other records are to be maintained on file with the purveyor and in the name of the purveyor.

(3) Water Quality

Water quality must be proven to conform with DSHS criteria specified in Chapter 248-54 WAC and/or any additional requirements contained in King County Board of Health, Title 12.

(4) Hydrostatic Pressure Test

A hydrostatic pressure leakage test will be conducted on all newly constructed water mains, fire lines, fire hydrant leads and stubouts

in accordance with DOT/APWA Section 7-11.3(11) or AWWA C-600 specifications unless otherwise specified by the designated utility.

(5) Disinfection and Bacteriological Testing

All pipe, reservoirs, and appurtenances shall be flushed and disinfected in accordance with the standards of the DSHS, AWWA C601 and D105, or DOT/APWA Section 7-11.3(12) unless otherwise specified by the designated utility.

(6) Auxiliary Power

All source and booster pumping facilities required for primary supply in an emergency shall be equipped with auxiliary power unless a redundant power supply source is provided. Where pumping is to a storage facility which is sized to permit down time for mobilization of a portable standby power unit, pigtail outlets and a manual transfer switching device are adequate. If the pigtail outlet approach is taken, the purveyor must provide a portable power unit. Where adequate gravity standby storage has been provided, no auxiliary power is required for pumping facilities. An adequately sized engine driven pumping device is an acceptable method to meet this requirement. Adequacy of facilities will be determined by the utility through its water comprehensive plan.

(7) Utility Interties

Planning for specific locations, size, and alignment of major water lines shall consider emergency interties with adjacent water utilities.

(8) Flow Measurement

All service lines shall be installed so that each residential, commercial, and industrial structure will have a separate metered service for domestic water received from the utility. This requirement may be waived by the utility, but, at a minimum, any new service will have a box for meter drop installation. If approved by the utility, domestic water consumption may be measured by a master meter for service to a complex, under single ownership, and where water utility line subdivision is impractical. Service lines providing fire flow may be required by the utility to be equipped with a fire detection check.

All new groundwater sources shall be provided with a device for measurement of depth to water and a meter for determining flow rate and total production. Installation of these devices is also recommended for existing groundwater sources. All new sources for which water treatment is included shall be provided with flow measurement.

(9) Cross Connection Control

Where the possibility of contamination of potable water exists, water services shall be equipped with appropriate cross connection control devices in accordance with Chapter 248-54 WAC. The utility and/or the County cross connection control program shall determine the need, size, kind, and location of the device.

B. Specific Provisions

(1) Pressure Requirement

Water systems shall be designed to provide an adequate quantity of water at a positive pressure of at least 30 psi under maximum instantaneous demand (MID) flow conditions measured at any customer's water meter or at the property line if no meter exists. If fire flow is to be provided, the distribution system shall be designed to provide the required fire flow at a pressure of at least 20 psi at the fire and positive pressure shall be maintained throughout the system during MID conditions (WAC 248-54-135).

(2) Pipe Sizing and Materials

With the exceptions noted within this document, the minimum pipe diameter shall correspond with the following land use designations: Urban Areas - 8 inch diameter; Transitional Areas - 6 inch diameter; Rural Areas - 6 inch diameter. In areas where fire flow is not required under current land use and where land use designations minimize the potential future requirement for fire flow, a smaller diameter pipe may be used if hydraulically justified.

Water main size shall be adequate to deliver required fire flow and to maintain the pressure requirement defined above. All water mains shall meet applicable engineering and health standards adopted by the State of Washington or the water purveyor, including Chapters 248-54 and 248-57 WAC.

All water mains subject to King County Code 17.08, which may serve fire hydrants, shall be a minimum of 8 inches nominal diameter for dead end mains and 6 inches nominal diameter for circulating mains. Hydrant leads less than 50 feet in length may be 6 inches in diameter. In a dead end cul-de-sac, mains sized for only domestic flow may be installed from the last hydrant to remaining residences.

All pipe material for new water systems shall be constructed with "lead-free" materials. The lead content for joint compound materials (solder and flux) used for pipe installation shall be less than 0.2 percent in order to be considered "lead-free." The lead content for all installed pipe shall be less than 8 percent in order to be considered "lead-free."

(3) Isolation Valving

Valving shall be installed in a configuration which permits isolation of lines. A valve is not required for short block lines of less than 100 feet. Valves should be installed at intersections with normal maximum spacing at 500 feet in commercial, industrial, and multiple- family districts, 800 feet in residential districts, and 1/4 mile in arterial mains.

(4) Air and Air-Vacuum Relief Valves

Air or combined air-vacuum relief valves shall be installed at appropriate points of high elevation in the system. All piping shall be sloped to permit escape of any entrained air. Combination air release/air vacuum valves shall have a rated operating pressure of 300 psi.

(5) Blow-off Assembly

A blow-off assembly or fire hydrant shall be installed on all dead end runs and at designated points of low elevation to provide a way for adequate flushing of the distribution system. The blow-off assembly shall be installed in the utility right-of-way, except where a written access and construction easement is provided for the water utility. In no case shall the location be such that there is a possibility of back-siphonage into the distribution system. The blow-off assembly shall be sized to achieve a flow velocity of 2-1/2 feet per second.

(6) Storage

Storage requirements are based upon three components:

- o Equalizing Storage, required to supplement production from water sources during high demand periods,
- o Standby Storage, required as backup supply in case the largest source is out of service, and
- o Fire Storage, required in order to deliver the level of fire flow service identified in the utility's approved plan (see "Fire Flow Requirements" below) for the required duration.

As a minimum, sizing of storage facilities shall be adequate to provide for equalizing storage, plus the larger of standby or fire storage requirements. Equalizing and standby storage volumes shall be determined using "Sizing Guidelines for Public Water Supplies", DSHS. Minimum fire storage volumes shall be determined using the fire flow and duration requirements of the County Fire Marshall, the respective municipal ordinance, or the minimum design standards prescribed herein. Siting of storage facilities should consider locations which provide gravity flow. In some cases, the system hydraulics may require additional storage.

(7) General Facility Placement

All piping, pumping, source, storage, and other facilities, shall be located on public rights-of-way or dedicated utility easements. Utility easements must be a minimum of 15 feet in width, and piping shall be installed no closer than 5 feet from the easement's edge. Exceptions to this minimum easement may be approved by the operating water utility. Unrestricted access shall be provided to all public water system lines and their appurtenances and public fire hydrants that are maintained by public agencies or utilities.

New Class 2, 3, and 4 utilities in undesignated service areas should consider future interties with Class 1 systems when determining the location of their distribution network.

The location of utilities shall be in accordance with the standards and guidelines established by King County or the appropriate City criteria. Where existing utilities or storm drains are in place, new utilities shall conform to these standards as nearly as practicable

and yet be compatible with the existing installations. Where practical, there shall be at least 3 feet horizontal separation from other utilities.

(8) Pipe Cover

The depth of trenching, installation of pipes, and backfill shall be such as to give a minimum cover of 30 inches over the top of the pipe from finished grade. This standard shall apply to all transmission and distribution piping and to service piping within the right-of-way unless specifically designed for an above ground installation.

(9) Water Line and Sewer Separation Distances

Transmission and distribution water piping shall be separated at least 10 feet horizontally from existing wastewater gravity or force mains. The bottom of the water main shall be 18 inches above the top of the sewer. Where local conditions prevent such horizontal and/or vertical separation, closer spacing is permissible where design and construction meet the special requirements of Section 2.4 of Ecology's Criteria for Sewage Works Design, as revised October 1985.

Separation distances between water piping and any portion of an on-site sewage system shall meet the requirements of the SKCBH Rules and Regulations.

(10) Fire Hydrants

Fire hydrants within cities shall adhere to the specific design criteria and standards utilized by the City Fire Department. Fire hydrants within the unincorporated areas of the County shall comply with the minimum design criteria set forth in King County Code 17.08. (King County is encouraged to address standardization of pipe threads in future revisions of this Code.)

(11) Fire Hydrant Location Installation Criteria

The location of fire hydrants within cities shall be located and/or installed as specified by the design standards of the city. Fire hydrants within the unincorporated areas of the County shall comply with the minimum location/installation criteria set forth in the King County Code 17.08. In all circumstances, these standards shall not be less stringent than the placement requirements prescribed by WAC 248-57-900.

(12) Fire Flow Requirements

New facilities installed by a water utility shall be designed to provide a level of service assigned to designated land uses within the County. The actual fire flow to be provided at a proposed development will be determined by the County Fire Marshall or City Fire Department Chief.

The minimum pipe size will be based on these standards. The location of hydrants and fire flow storage requirements will be based on the designated level of service identified during the water system planning process or the rated flow and duration for public water supply for fire protection, whichever is greater. The Fire Marshall shall consider the availability of water service based upon a phased improvement plan within the utility's water system plan and shall specify the fire flow requirements in conjunction with the utility, confirming the availability of water service. All water systems providing fire flow should be designed to deliver water supply to the services which require fire flow with a minimum rated flow of 1,000 gpm. The Fire Marshall will determine the duration required for fire protection.

(13) Maintenance of Fire Protection Facilities

A written operational agreement which identifies responsibilities for maintenance and testing of fire protection facilities shall be negotiated between the fire department or district and the water utility.

6. WAIVER PROCESS

A waiver process exists for circumstances where the minimum design standards create undue hardship. Outside designated service areas, a waiver may be obtained through the Appeals Process described in Section XI. In this instance, a waiver can only be granted to Class 4 systems located in rural land use areas where fire flows are not required.

Within designated service areas, the designated purveyor has the sole authority to allow the installation of facilities for remote systems which conform with DSHS standards but are less stringent than the East King County Minimum Design Standards. In this instance, lesser standards can only be granted to new systems with four or fewer service connections and where fire flow is not required. The acceptance of lesser standards should be noted on the Certificate of Water Availability by the designated utility and in its service area contract

with the applicant. It is anticipated that this waiver will be utilized primarily when the proximity of a smaller system will benefit from larger, nearby facilities planned for future installation by the designated utility.

7. STANDARDS REVIEW SUBCOMMITTEE

A Standards Review Subcommittee shall be established by the Water Utility Coordinating Committee (WUCC) and shall convene at least annually to review these standards and their implementation. The Subcommittee shall seek input from the King County Fire Marshall, the City fire departments, and King County fire protection districts in matters related to fire protection standards. Recommendations of the Standards Review Committee shall be submitted to the WUCC and, if revisions are approved, they shall be forwarded to the County Council for adoption.

8. SEVERABILITY

If any provision of these standards or their application is found to be invalid, the remainder of the standards and their implementation are not affected.

SECTION V

SECTION V

UTILITY SERVICE REVIEW PROCEDURE

1. INTRODUCTION

This Coordinated Water System Plan (CWSP) establishes a set of administrative procedures, water resource policies, and growth objectives for East King County water utilities. The procedures are to guide local officials, citizens, developers, and state and federal regulatory agencies in identifying the necessary facilities for providing an adequate water service.

Provisions of the Public Water System Coordination Act require that no new public water system be established within East King County unless it is determined that existing purveyors are unable to provide the service, in a timely and reasonable manner. This section presents the administrative procedures for reviewing development proposals and associated requests for water service in East King County, in order to identify existing purveyors who are willing and able to extend this new water service.

A general philosophy of the CWSP is that water utility service should not dictate growth patterns. On the contrary, land use policies should establish growth trends within the water utility service areas to permit the water utility management program to be responsive to, and provide service commensurate with applicable adopted land use policies.

Water system plans must address the water system facilities required to accommodate growth. This growth is projected to occur within each utility's service area, based upon the County's Comprehensive Plan, municipal land use plans where an interlocal agreement exists, and adopted Community Plans. Capital improvements are planned and constructed to conform with the anticipated service requirements associated with those Plans.

In addition, if an applicant for water service is proposing a land use change, such a change could incur a significant financial burden on the provider of water service. Because water utilities must, of necessity, develop their systems to conform with applicable land use plans, any major change in land use may require substantial system improvements to serve the proposed development. Therefore, special review procedures will apply to applications which propose a land use change.

2. UTILITY SERVICE REVIEW PROCEDURE

The Utility Service Review Procedure (USRP) identifies the utility in whose designated service area a proposed development lies. It then describes the available, prioritized water service options. It also describes options for water service to proposed developments lying outside of designated service areas.

Within the USRP process, reference to "service area(s)" means the specific geographical area described in the written agreement required by RCW 1090.116.070(1) and WAC 248-56-730(1). The service area boundary will be identified by a map attached to the agreement. The boundary will include the area within which direct service or retail service connection to customers is currently available (existing service area) and the area for which water service is planned (future service area) by the designated utility.

The USRP applies to all development proposals and associated requests for water service requiring approval by the County. These include: new plat or subdivision development; short plats; land use permits, changes and approvals; rezones; issuance of residential and commercial building permits; creation of new water systems; resolution of health emergencies arising out of existing public water systems; source site inspections; and other activities. At the time an application is submitted for permits or approvals, or upon request, the King County Building and Land Development Division (BALD) will initiate and finalize the review procedure. They will coordinate the review with the Seattle-King County Health Department (SKCHD) prior to issuance of any approvals. A flow chart of steps to be followed in the USRP is provided as Exhibit V-1.

The USRP procedures are intended to identify an existing water purveyor willing and able to provide water supply facilities and to include the new development within its service area. In effect, the result of the USRP is to assign the proposed new development or land use to the service area of a designated water utility. In the event a designated utility is unable or unwilling to provide service, the prioritized referral process referenced in subsequent paragraphs should be followed.

Pursuant to State law, water service requests occurring within a contested service area or the service area of a utility that has not completed either its individual Water System Plan (WSP) or its Service Area Agreement may be denied until these issues are resolved.

A. Development Proposals or Water Service Requests in Conformance with Applicable Land Use Plans

When development and associated water service applications conform with land use plans and zoning ordinances, the USRP will generally follow the sequential steps outlined in Exhibit V-1. This procedure is described by the following:

(1) The King County Parks, Planning, and Resources Department, BALD, will coordinate review of all development proposals within the unincorporated area of King County. BALD will be responsible for ensuring conformance with the applicable comprehensive land use plans, Community Plans, Zoning Code, service area agreements for future municipal annexation areas, and utilities' water system plans. Upon determination of appropriate land use designation, BALD will review building requests for conformance with the appropriate building and fire codes throughout the County.

(2) The review of development applications which propose to use a private well or spring source to serve a single service will be coordinated with the SKCHD in the following manner.

First, if the proposed development is outside the designated service areas of existing purveyors, the application will be referred to the SKCHD for direct action. The SKCHD will develop guidelines for source development which will be available to applicants. In cases where the SKCHD determines that use of a private system would entail a health hazard, construction can be denied. This would require the applicant to contact an appropriate existing adjacent system.

Second, where the proposed development is within the designated service area of an existing utility, BALD will refer the applicant to that utility. The intent of this referral is to bring the applicant and utility together for an examination of the alternatives of connecting to the existing public system. Should the utility not be willing or able to provide timely service or the applicant considers the conditions of service to be unreasonable, the applicant will be referred to the SKCHD for action as described in the first instance above.

(3) Where two or more service connections are proposed, the applicant must coordinate his supply needs with an existing utility, as assigned. The BALD will review the proposed water service request and refer the applicant to a designated utility, adjacent utilities, SSMAs, or allow the creation of a new utility, as outlined in the steps below.

(a) Proposed Development Within Designated Service Areas

The applicant will be referred to the designated utility. In response to a request for water service, the utility will give notice of its intent to exercise one of the following options, in order of priority:

- The designated utility provides direct service by extending existing mains and supply; or
- The designated utility approves design of a detached remote system and then owns or operates the system. A contract establishes responsibilities for operation, management, and financial obligations until the two systems are connected; or
- The designated utility approves design of a detached remote system and enters an agreement specifying the operation and financial requirements of the owners of the remote system. The remote system may be operated by an adjacent utility, an SSMA, or the developer/homeowners association. The designated utility retains contractual responsibility for monitoring operation and for water quality. The remote system owners are responsible for financing and proper operation. Where the remote system consists of four or fewer connections that requires no fire flow, the designated utility may allow facilities which meet DSHS standards but are less stringent than the CWSP minimum design standards. It is anticipated that these more lenient standards will be utilized primarily when the proximity of a small system will benefit from larger nearby facilities planned for future installation by the designated utility.
- The designated utility denies the provision of service, relinquishes that portion of its service area, and a new system may be created.

(b) Proposed Development in Relinquished Service Areas or Non-Designated Areas

If a designated utility is unwilling or unable to provide service or the development is in an undesignated area, the following will occur:

- o BALD identifies adjacent purveyors with an approved water system plan that provides for expansion and gives them the first option to serve the new development. If responsibility is accepted, service area boundaries are changed; or

- o If an existing purveyor is unwilling to assume ownership or operational responsibility, BALD will refer the developer to an approved SSMA list; or

- o If no SSMA is willing to assume responsibility for service under reasonable terms, the developer may create a new system. The new purveyor will be required to submit a service area agreement and prepare a water system plan with all applicable financial and operating planning information.

(4) The proposed project must be reviewed with the assigned utility to identify the engineering, design standards, financial, managerial, and other requirements of service. Fire flow requirements for the proposed project will be determined by the appropriate Fire Marshal and reviewed by the utility prior to its signature of a Certificate of Water Availability. Review by the assigned utilities will ensure the applicant and purveyor have discussed the requirements of both parties.

The utility will provide to the applicant a signed Certificate of Water Availability listing conditions of service prior to King County's issuance of the required approval/permit. A joint committee composed of representatives of the various King County WUCCs and King County staff have developed a Certificate to be uniformly used in all CWSP areas.

(5) After the preliminary plat or other land use permits are approved, a written contract should be developed and executed between the utility and applicant to formalize the conditions of service responsibilities. Although each utility may have special considerations to be included within their contract, Appendix F provides an example of suggested model contract components specifying the relationships and responsibilities of the utility and applicant. This same contract format is applicable to Satellite System Management, as described in the next Section.

Prior to approval of final plat or building permits, the water facilities are to be installed to meet the utility's minimum standards, or bonded for completion.

B. Development Proposals or Water Service Requests Not in Conformance with Applicable Land Use Plans

If a development proposal requires a zoning change or alteration of applicable land use plans, then each affected utility shall be contacted by the BALD and allowed to comment on the proposal prior to approval of that change. By identifying new or additional utility costs associated with changes in land use or zoning, these costs of development can be integrated into the decision making process. This will allow the assignment of these costs to customers benefiting from the land use change.

C. Appeals Process

Rules adopted by DSHS provide that no new public water system is to be approved within the external boundaries of a Critical Water Supply Service Area (CWSSA) unless specifically authorized by DSHS. Such authorization may be granted under certain conditions. A key determinant is whether existing purveyors can provide service in a timely and reasonable manner (WAC 248-56-620). For purposes of reviewing and resolving such issues, BALD will coordinate a two-step appeals process as described in Section XI.

3. SPECIAL REVIEW CONSIDERATIONS

In the review of development proposals and associated requests for water service, the BALD shall be guided by the special considerations provided below:

A. Applications for Service to Non-Residential Properties

Commercial and industrial properties represent a fire flow responsibility that may greatly exceed flows required for residential housing. These flow requirements are critical to the sizing of the storage, pumping, and piping facilities. For these reasons, BALD shall also use the referral process described herein for all proposed commercial and industrial developments.

B. Expansion of Existing Class 3 and 4 Water Systems

The SKCHD identified 34 out of over 900 Class 3 and 4 water systems and systems with pending applications in the East King County area which anticipate future expansion. These systems are identified in Exhibit III-3 and their expanded service areas are recognized in this Plan. Expansion of these systems is being tracked by SKCHD with respect to the number of active services versus initially approved services. Expansion beyond the initial approval will not be allowed without further review of system capabilities by SKCHD or DSHS.

Special consideration is required for the future expansion of small systems both inside and outside designated service areas. These issues are addressed below:

(1) Expansion Outside Designated Service Areas

Expanding Class 3 and 4 systems located outside of designated service areas of existing utilities will be referred by BALD to adjacent utilities with approved water system plans or SSMAs. This will allow the expanding Class 3 or 4 system to discuss and evaluate utility service proposals by an adjacent utility or SSMA versus expansion. If the decision is made to pursue expansion, the system owner must submit to BALD a completed Service Area Agreement and a Water System Plan commensurate with the planned system expansion.

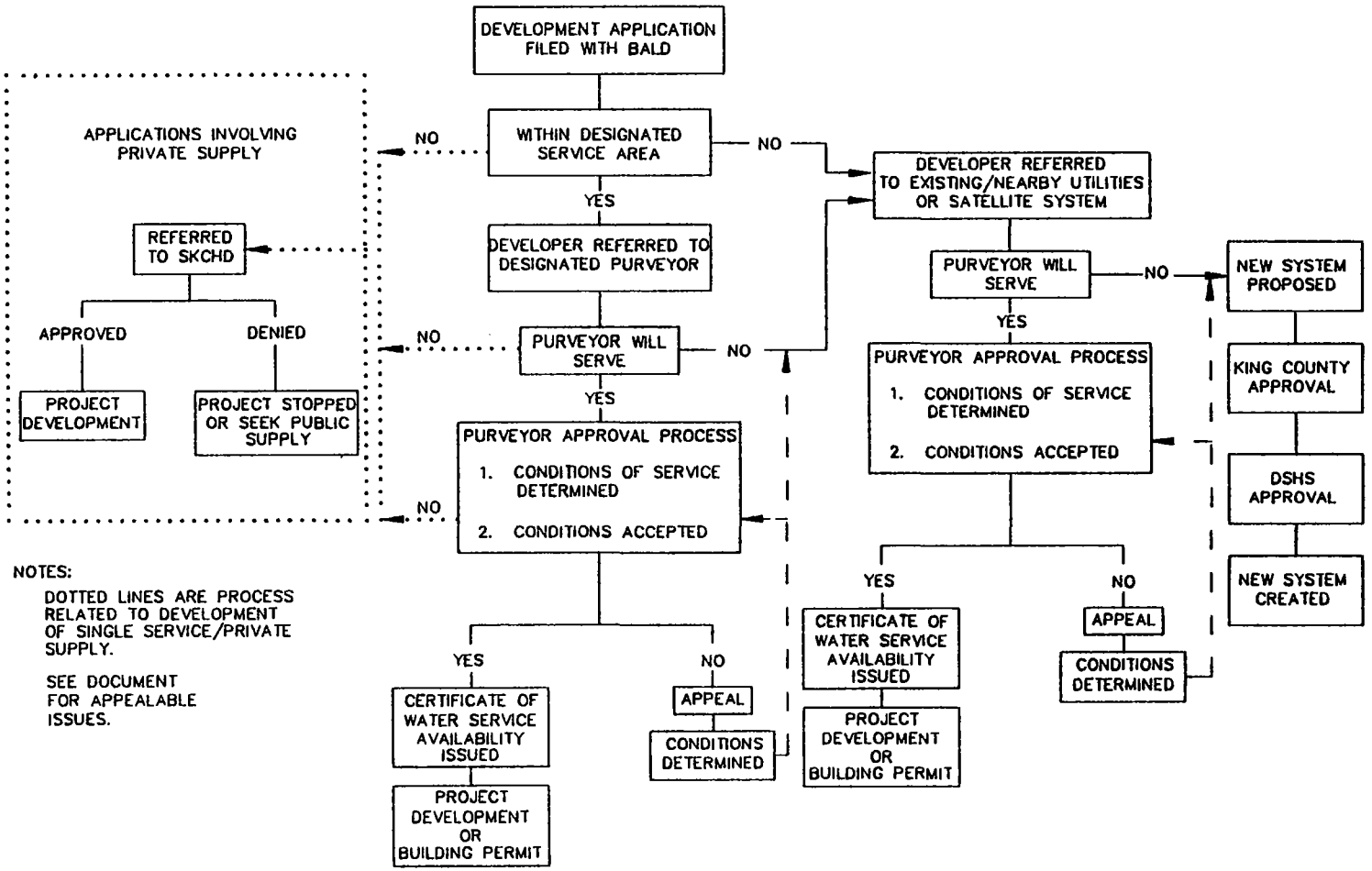
(2) Expansion Within Designated Service Areas

Expansion beyond initially approved service connections for an existing smaller utility located within a designated utility service area will not be allowed without approval by the larger utility. The CWSP places responsibility on the review agencies to recognize a specific utility's service area. In turn, the utility is responsible for effective management within that service area.

4. ACTIVITIES WITHIN MUNICIPAL BOUNDARIES

Water service requests within established city limits are not subject to the USRP. Applicants for such water service must contact the municipality directly.

EXHIBIT V-1
UTILITY SERVICE REVIEW PROCEDURE
FLOW CHART



SECTION VI

SECTION VI

SATELLITE SYSTEM MANAGEMENT PROGRAM

1. INTRODUCTION

As described in Section V, the Utility Service Review Procedure (USRP) is a process to be implemented by King County, whereby proposed developments requiring a public water supply will be referred to existing utilities as a first step in obtaining water service. This process applies to developments proposed both within and outside of the designated service areas of existing utilities. The goal of this process is to minimize the creation of new public water systems.

During the plan development process, the Water Utility Coordinating Committee (WUCC) recognized that many utilities would not be able to immediately serve new developments within their service areas by direct connection. Also, a portion of the study area remains undesignated in that no existing utility plans to serve that area at the present time. The WUCC also recognized that many existing, small utilities need technical and financial assistance to properly operate and maintain their systems under increasing requirements at the local, state, and federal level.

Given the circumstances, the WUCC developed a program designed to provide operational and/or support services to new and existing public water systems. This program is the Satellite System Management Program (SSMP) which is described in this Section.

2. GOALS OF PROGRAM

A. For the Customer

(1) Assure the homeowner/final user is entitled to:

(a) A safe drinking water supply.
(b) An economic supply, both in the short- and long-term.
(c) A voice in the operation and financing of the system.

(2) Assure that responsibility for operation, maintenance, and repair of the system is defined with respect to:

(a) Financial ability to repair the system when it is needed (short- and long-term).
(b) Timely response (24-hour availability).

(c) Water quality.
(d) Competent and qualified staff or contract personnel.

B. For the Regulator

(1) Provide a program structure which:

(a) Minimizes new systems.
(b) Identifies a 24-hour contact/focal point.
(c) Results in systems managed by knowledgeable owners and operators.
(d) Assures financial responsibility.
(e) Assures compliance with water quality requirements.
(f) Assures system reliability and compliance with design standards.

C. For the Owner

(1) Results in a water system that:

(a) Has financial stability.
(b) Is long-term.
(c) Has responsibilities and contact persons well identified.

3. SATELLITE SYSTEM MANAGEMENT AGENCY (SSMA)

To achieve these goals, an SSMA concept was adopted by the WUCC. Under this concept, qualified public or private entities may provide water system operation and management services to a number of utilities. Through the resulting economies of scale, skilled personnel may be employed and water rates maintained at the lowest possible level.

For purposes of the Coordinated Water System Plan (CWSP), an SSMA is defined as any entity, public or private, that is certified to be qualified to properly operate and maintain a public water supply system, either through direct ownership or on a contract basis. The WUCC concluded that a uniform, statewide, approach is needed to define the responsibilities of SSMAs, and specifically, what level of reporting requirements and financial qualifications are needed by an SSMA. Therefore, the WUCC recommended that the Department of Social and Health Services (DSHS) establish, through regulations, the certification procedures.

It is intended that all classes of public water systems may seek certification under this program. Once certified, an SSMA may:

- o Provide services to new systems within the undesignated area of the Critical Water Supply Service Area (CWSSA), where neighboring, existing systems cannot provide service in a timely and reasonable manner. Services may be provided by direct ownership of the system or through contract with the developers.

- o Provide services to new developments within the service area of an existing utility, at the request of, and through contractual arrangements with, the designated utility. This is intended as a temporary arrangement which terminates when the designated utility assumes direct responsibility for water service to the development.

- o Provide services to existing utilities if either within or outside of designated service areas, through ownership or contractual relationship.

4. IMPLEMENTATION

The program adopted by the WUCC is to be implemented in the following manner:

A. New Systems Within Designated Areas

The designated purveyor determines the method of providing "public water service" in the following order or relinquishes portions of the designated service area:

(1) Purveyor extends service; or,

(2) Purveyor approves design of remote system and then owns and operates system; or

(3) Purveyor approves design of remote system and enters into an agreement for operation of system by property owners or a contract operator (see 4.C. below regarding the recommended form and content of the agreement). The purveyor retains contractual responsibility for quantity and quality, is responsible for monitoring operation, and property owners are responsible for financing and operation; or,

(4) Purveyor relinquishes service area and new system created.

B. New System/Non-Designated Area

(1) The County identifies adjacent purveyors with an approved water system plan that provides for expansion and gives them first option to service the new development as a remote system. If responsibility is accepted, boundaries are changed; or,

(2) If a new system is created due to the absence of a willing existing purveyor to assume ownership or operational responsibility, the County will refer the developer to an approved SSMA list. The SSMA assumes ownership and/or operational responsibility through agreement with the developer or property owners; or,

(3) If no SSMA is willing to assume responsibility for service under reasonable terms, the developer may create a new system, and the new purveyor will be required to demonstrate the ability to ensure compliance with the items included in the agreement referred to in 4.C. below, and have an approved financial plan. The financial plan and its use must be filed with the County annually.

C. The responsibilities of the developer and operator should be clearly delineated in an agreement. An example of an agreement format and categories of issues which, at a minimum, are recommended to be addressed by the agreement, is provided in Appendix F.

5. SUPPORT SERVICES BY UTILITIES AND AGENCIES

In order to assist in identifying which systems are in need of an SSMA or other forms of utility support, the WUCC recommends that DSHS and Seattle-King County Health Department (SKCHD) provide the following assistance for all systems:

- Regularly survey to verify compliance with routine bacteriological and chemical analysis, as well as system design and operation necessary to protect public health, as provided in Chapter 248-54 WAC, and KC Title 12, or as amended;
- Water quality monitoring and laboratory services;
- Coordinate inventory and records; and
- Coordinate list of qualified SSMAs.

The East King County Regional Water Association (EKRWA) should also provide technical support and data management services for Class 1 systems.

Following completion of the surveys and the filing of findings, DSHS and SKCHD will implement an aggressive monitoring and enforcement program. On a voluntary basis, the EKRWA will initiate a Technical Services Program designed to provide assistance, upon request, to water purveyors, SKCHD, and DSHS, and to make recommendations on how the Class 1, 2, 3, and 4 systems will be able to meet their responsibilities as public water suppliers. EKRWA will assist by categorizing the inventoried systems into the following recommended management categories:

- o Transfer operation and/or ownership to a designated Class 1 utility.
- o Transfer operation and/or ownership to a qualified SSMA.
- o Contract with qualified operating agencies and/or existing Class 1 purveyor, with the property owners retaining ownership responsibility.
- o The existing owner has the ability to retain ownership and operating responsibility, with the County monitoring compliance with regulatory requirements.

EKRWA members will work with those Class 3 and 4 systems recommended for transfer of ownership and/or operation in an effort to expedite the scheduled corrections to potential public health problems.

6. PREQUALIFICATION OF SATELLITE SYSTEM MANAGEMENT AGENCIES

In order to assure that non-municipal SSMAs providing the above services have adequate resources to meet both the current and future needs of King County, a prequalification process is recommended. This process does not apply to city or special purpose district municipal water utilities.

The WUCC determined that an SSMA program is valuable to the area and to the State. However, it was also concluded that a uniform State-wide approach is needed to deal with the responsibilities of SSMAs and, specifically, what level of reporting and financial qualifications are needed by an SSMA. Therefore, the WUCC recommended that DSHS should establish qualification procedures for an SSMA. It was also recommended that SKCHD and King County Building and Land Development Division maintain a list of approved SSMAs for use in the utility service review procedures.

The WUCC also recommended that structured financial criteria be developed for SSMAs. The WUCC suggested that all new water systems, unless municipally owned or regulated by the State Utility and Transportation Commission, should be required to establish a dedicated Renewal/Replacement Account and a financial plan/program, with dollar amounts to be based on the new system's

needs for reserves and for major repairs. The Account should be pledged to the water system's customers/properties to be used exclusively for renewing, replacing, or upgrading capital water facilities, including direct service connection to another system.

It was further recommended that SSMAs and new water systems submit an annual financial report to SKCHD and/or DSHS, as appropriate, for review. All parcels included within the designated service area of a water purveyor may be subject to a minimum monthly assessment necessary to pay their proportionate share of the operating and maintenance costs and funding for a reserve account of the financial plan.

SECTION VII

SECTION VII

WATER SUPPLY REQUIREMENTS

1. WATER DEMAND FORECAST

A. Introduction

Planning for future water supply needs requires projection of demand for both near- and long-term periods. The near-term projections are generally necessary to define needed capital improvements anticipated within the near future. Such improvements require lead time for financing, design, and construction. Long-term forecasts are necessary to quantify probable water resource requirements. Such forecasts guide the sizing and identification of long-range supply facilities, the water rights reservation process, and management of water resources necessary to meet future demands.

Population growth is the single most influencing factor in future water demand. Not only does the magnitude of future population have an impact, but the location of new population centers will greatly affect delivery of future water supplies. Therefore, population growth has to be coordinated and based on approved land use plans and policies.

Water demand projections through the year 2040 were based on existing studies, population projections, current water use figures and land use patterns. Categories of existing water use were identified, when possible. They included residential, commercial, industrial, and other significant water users. Future demand forecasts are expressed as average day demand. Data has been assembled from the utilities, the Department of Social and Health Services (DSHS), the Department of Ecology (Ecology), King County, and Puget Sound Council of Governments (PSCOG).

B. Methodology

The forecast procedure and criteria were developed by the Water Utility Coordinating Committee's (WUCC) Data Base/Planning Data Subcommittee with technical assistance from the Seattle Water Department (SWD) and Economic and Engineering Services, Inc. (EES). The forecast utilizes econometric models (i.e., statistically based economic models) which were developed for the SWD for utilities it

serves. However, these models are applicable for utilities not served by the SWD since they are calibrated based on individual utility data and are based on variables such as weather, the price of water, and demographic data calibrated to East King County.

The advantage of using these models was the allowance for the effects of weather, real water prices, and other economic variables on water demand. These models allowed for the modelling of individual utilities where baseline data was available.

Two databases were developed. The SWD collected historical information for the utilities it serves. A second survey of utilities not directly served by the SWD was performed by EES. These surveys were utilized to calibrate the forecast models. Those utilities which responded to the survey were forecasted on an individual basis and are listed in Table VII-1. Those utilities which did not respond were grouped and forecasted as a single entity and are listed in Table VII-2. The grouped utilities were forecasted based on average demand for utilities with data, as well as area specific demographic data.

The individual utility forecasts are based on future service areas. These future service areas were determined by joint agreement of the utilities involved through the process described in Section III. Population and employment forecasts by census tract were overlaid on the agreed upon service areas to generate forecasted households and employment by service area. There is one particular area where there is not agreement on the service area boundaries. This area is generally located to the north and east of Redmond and Union Hill and is labeled "disputed" in the forecast tables.

The planning area for the forecast includes some territory which is not served by any utility but which contains forecasted population. These "unclaimed" areas are small and are forecasted based on utilizing average demand from the rest of East King County. All retail sales are accounted for in the planning area. By forecasting for all utilities, areas unclaimed, as well as areas of dispute, the forecast is comprehensive. While individual utility forecasts may deviate, the total forecast, in conjunction with the sensitivity analysis, provides a reasonable approach to overall East King County water planning.

C. Forecasting Models

The purveyor forecasting model was developed by the Data Base/Planning Data Subcommittee and SWD, with assistance from Synergic Resources Corporation and EES. (A technical discussion of the model is contained in the report entitled, "Purveyor Water Consumption

Forecasting Models" submitted by Synergic Resources Corporation, in cooperation with EES. The report is available as a separate technical report.) Model development included the use of up to 10 years of historical purveyor consumption, rate, weather, economic, and demographic data. Historical purveyor consumption and rate data came from a recently assembled comprehensive database completed by SWD and the Purveyor Committee, with the assistance of Gibson Economics, Inc. Historical economic and demographic data were from census tract data provided by PSCOG. Historical weather data were provided by the National Oceanic and Atmospheric Administration as recorded at SeaTac Airport. The model is applicable to utilities not served by SWD since it is calibrated based on individual utility data and is based on variables such as weather, the price of water, and demographic data calibrated to East King County. The model consists of five submodels which correspond to various customer classes. Income and price data were adjusted for inflation. Data adjusted for inflation is said to be in "real" dollars. The five submodels are:

(1) Single Family;
(2) Multi-Family;
(3) Commercial/Industrial;
(4) Government/Education; and,
(5) Aggregated (used for utilities without customer class data).

Schematic diagrams for each of these submodels are contained in Appendix G. Submodels 1 through 4 were employed to forecast water demand in each case where a purveyor provided historical data by customer class. Submodel 5 was developed to forecast purveyor water demand where customer class data was not provided. Submodel 5 was employed in those cases where the only data provided was data aggregated over all customer classes (i.e., where a purveyor only provided total volume sold and gave no customer class breakdown). The aggregated submodel is utilized when the submodels 1 through 4 are not applicable to a particular utility.

D. Forecast Assumptions

The forecasting models are driven by a number of independent variables including employment and household forecasts provided by the PSCOG for the base forecast. A sensitivity analysis was performed on the PSCOG forecast utilizing the State of Washington's Office of Financial Management population forecast, as well as a forecast by a local utility to construct a low and high banding of the base forecast. This sensitivity analysis found that a +.2 percent and -.5 percent change in the annual rate of growth from the PSCOG figures was reasonable.

Certain submodels contain the real price of water which is an important variable given the projected rising cost of supply. The Data Subcommittee performed an internal study which found that the projected water price would grow at 2.5 percent real annual growth, with a banding of 3.0 percent and 1.5 percent.

The submodels generated forecasted demand at the customer meter. Losses of 15 percent were added to the submodels forecasts. Losses include a variety of necessary water such as fire fighting, street washing, system flushing, etc. The 15 percent loss figure is based on a review of survey results and discussions in the Data Subcommittee.

A conservation program developed by the Supply Studies Subcommittee was incorporated into the forecasts. A projected savings of 8 percent for large utilities (over 10,000 customers) and an average savings of 5.5 percent for small utilities (under 10,000 customers) was incorporated in the forecasts. The conservation saving was ramped to occur in full by the year 2000. Because the real price of water is part of some of the submodels, a certain amount of price-related conservation would be predicted by the submodels outside the formal programs. The conservation savings are adjusted for this price overlap problem by a methodology utilized by the SWD.

Certain models also included weather variables. Normal weather was utilized in the forecast. For models which contained real income, an annual change of 1 percent was assumed based on Seattle City Light studies.

A sensitivity analysis was performed to delineate reasonable high and low bands for the forecast based on real water price banding and households/employment. The household annual growth was varied by a +.2 percent and a -.5 percent change in the annual growth rate from PSCOG annual growth rates for the forecast horizon. The real price of water variable was banded in the sensitivity analysis by annual growth rates of 3.0 and 1.5 percent. The analysis showed that water demand was most sensitive to the household growth changes. The price changes were contained within the household sensitivities.

E. Forecast Results

The base forecast of water demand in million gallons per day (MGD) for the East King County CWSP area is:

Year	Water Demand in MGD
1986	62
1990	66
2000	82
2010	98
2020	120
2030	144
2040	168

These values are graphically shown on Exhibit VII-1, together with a high and low forecast to delineate a reasonable range of water demand. A summary of forecasts by individual utilities appears in Exhibit VII-2.

2. WATER CONSERVATION PROGRAM

A. Purpose

Water conservation was addressed early in the study process as a supply option. It was recognized that:

- The water conservation program to be implemented must be defined.
- The associated reduction in water use and the period over which it occurs must be quantified.
- The targeted reduction must be factored into the demand forecast. Regional water supply need projections would be reduced commensurate with the anticipated water savings.
- The water conservation program would be included as a base element in any program for future water supply.

B. Elements Considered

Drawing upon existing literature and the experience of member utilities, 24 measures were identified as having some potential for successful implementation by East King County utilities. The general criteria for selection were:

- History of effectiveness,
- Addresses areas of known concern,
- Capable of being implemented by the year 1990, and
- Reasonably acceptable to East King County utilities.

These measures were then grouped for evaluation into the three categories of: (1) public education, (2) technical assistance, and (3) policy. A fourth category of "meriting consideration" was also identified. Elements within this fourth category were not recommended for inclusion in a program at this time.

The conservation elements considered are listed by category in Exhibit VII-3. A brief description of each is contained in Exhibit VII-4, except for Home Water Audits which was not included in the recommended program.

C. Recommended Program

A three-tiered program has been developed. The overall recommended program is shown on Exhibit VII-5. Within the three-tiered program, activities are assigned for accomplishment by the utilities and/or a regional organization such as the EKRWA. Where a dual role is shown for a particular activity, the utility is lead with the regional activity being one of support.

The scope of programs vary from:

- A Base Program which is a minimum level expected of all public water utilities with less than 500 customers. Since this size utility generally does not have staff that can devote time to a conservation program, the emphasis is on the regional program. Public Education and Technical Assistance services would be provided in support of the smaller utilities in the Base Program.

- A Moderate Program would be implemented by the majority of the municipal corporations (cities and districts). This program would apply to cities with fewer than 10,000 customers and all other water utilities serving 500 or more customers. The emphasis in this program shifts to greater utility implementation with regional support.

- A Comprehensive Program would apply to cities serving 10,000 or more customers. At this time, only Bellevue and Renton fall within this category. This program is limited to the larger cities due to staffing considerations and the need to utilize land use or building code controls for implementation of some of the program measures.

D. Projected Reduction in Water Use

The projected reductions in water use achieved under each of the three programs are shown on Exhibit VII-5. These are: (1) Base Program - 4 percent; (2) Moderate Program - 6.5 percent; and (3) Comprehensive Program - 8 percent.

Two key assumptions influenced these projections. These are first that the implementation of the conservation elements is achievable by the utilities and/or regional organization. Second, the regional organization will have the resources to implement the Public Education element under the Moderate and Base programs at a level equal to or greater than the Comprehensive program.

With adoption of this program, the WUCC recommended the demand forecast for the East King County CWSP be reduced commensurate with the percentages indicated. This reduction is applied to the average day per capita consumption requirements.

E. Implementation Schedule

It is recognized that many East King County utilities have in place or are currently developing water conservation programs. The scope of such programs and the rate of implementation varies. Thus, the rate of achievement of the above indicated water use reduction will also vary among utilities.

For purposes of demand forecasting, the WUCC recommended the following schedule be assumed for program implementation:

1990 - Program initiated
1995 - Program in place by utilities and regional organization
2000 - Demand reduction achieved

TABLE VII-1

LIST OF FORECASTED UTILITIES

UTILITY NAME
Ames Lake Water Association
Beaux Arts
Bellevue
Bothell
Cedar River Water & Sewer District
Disputed Area - Wood., Redmond & Union
Duvall
Heathercrest Water System
Issaquah
Kirkland
Mercer Crest Water System
Mercer Island
Mirrormont Services, Inc.
NE Lake Washington Sewer & Water District
NE Sammamish Sewer & Water District
Redmond
Renton
Rose Hill Water and Sewer District
Sammamish Plateau Water & Sewer District
Soos Creek Water & Sewer District
Trails End Maintenance Association
Unclaimed areas
Union Hill Water Association
Water District # 42
Water District # 83
Water District # 90
Water District # 107
Water District # 119
Water District # 127
Wilderness Rim Maint. Assn.
Woodinville

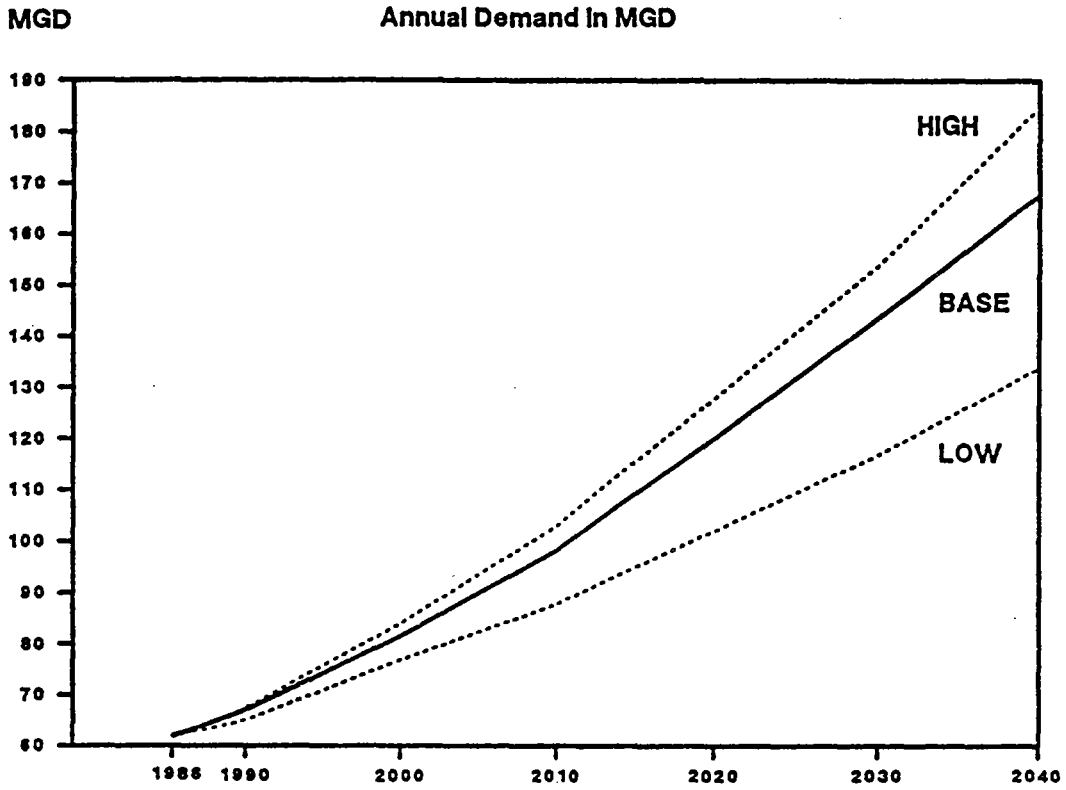
TABLE VII-2

LIST OF GROUPED UTILITIES FORECASTED AS TOGETHER

UTILITY NAME
Avon Villa Trailer Park
Campton Water Supply
Carnation
Carnation Research Farms
Dorre Don Water System
Echo Glen Children's Center
Edgehill Water Association
Four Lakes Water System
Lake Magaret Water System
Loclomon Subdivision
Maplewood Addition Coop
Mobil Home Wonderland
Mount Si Mobile Home Estates
North Bend
Overdale Park Water
Riverbend Homesites
Riverbend Mobile Home Park
Sallal Water Association
Shorewood Apartments
Snoqualmie
Spring Glen Water Association
Twenty-three 800 Tiger Mtn. Rd. Water Association
Upper Preston Water Users Assn.
Water District # 1
Water District # 17
Water District # 117
Water District # 122
Water District # 123

EXHIBIT VII-1

EAST KING COUNTY
WATER DEMAND FORECAST



EAST KING COUNTY WATER DEMAND FORECAST
SCENARIOS IN MGD

		SCENARIO ANALYSIS			
YEAR	BASE	LOW	% FROM BASE	HIGH	% FROM BASE
1986	62	62	-0.0%	62	-0.0%
1990	66	65	-2.8%	67	0.7%
2000	82	77	-5.8%	84	2.7%
2010	98	88	-10.8%	103	4.8%
2020	120	102	-15.1%	128	6.2%
2030	144	117	-18.9%	154	7.1%
2040	168	134	-20.4%	185	9.8%

EXHIBIT VII-2

EAST KING COUNTY WATER DEMAND FORECAST (CCF)
SUMMARY

YEAR	AMES LAKE	BEAUX ARTS	BELLEVUE	BOTHELL	CEDAR RIVER	DISPUTED	DUVALL	GROUPED	HEATHERCREST	ISSAQUAH
1986	58,543	18,019	7,286,119	480,603	639,909	132,677	74,626	480,390	5,828	598,400
1990	68,830	17,172	7,514,369	506,174	765,397	156,560	105,233	520,773	5,966	741,513
2000	117,993	17,995	8,247,762	738,531	1,119,362	276,148	156,315	727,004	7,386	1,022,760
2010	167,913	18,731	9,020,873	949,748	1,558,492	401,299	209,890	989,066	9,236	1,298,120
2020	238,264	19,722	9,903,345	1,242,176	2,189,992	589,610	276,140	1,301,530	12,183	1,644,061
2030	308,615	20,577	10,838,524	1,570,557	2,910,268	793,694	348,459	1,644,890	16,943	2,001,446
2040	393,962	21,432	11,794,185	1,904,397	3,642,595	997,778	421,979	1,988,249	21,703	2,358,832
AARG										
1986-2000	5.1%	-0.0%	0.9%	3.1%	4.1%	5.4%	5.4%	3.0%	1.7%	3.9%
1986-2040	3.5%	0.3%	0.9%	2.5%	3.2%	3.7%	3.1%	2.6%	2.4%	2.5%

EAST KING COUNTY WATER DEMAND FORECAST (CCF)
SUMMARY

YEAR	KIRKLAND	MERCER CREST	MERCER ISLAND	MIRROR-MONT	N.E. LAKE WASHINGTON	NORTHEAST SAMMAMISH	REDMOND	RENTON	ROSE HILL	SAMMAMISH PLATEAU
1986	1,117,631	47,355	1,443,892	76,993	2,898,401	266,795	1,715,238	3,274,435	1,450,025	628,674
1990	1,190,772	45,810	1,385,111	81,946	3,105,278	404,783	2,001,267	3,421,313	1,589,564	793,158
2000	1,398,803	43,741	1,306,118	110,398	3,812,228	623,329	2,657,021	3,789,957	1,996,915	1,258,384
2010	1,612,435	42,746	1,275,213	149,105	4,562,641	864,509	3,175,465	4,386,648	2,366,242	1,811,284
2020	1,861,532	41,804	1,246,102	201,146	5,484,770	1,197,753	3,800,505	5,134,146	2,799,052	2,623,195
2030	2,111,028	40,852	1,216,697	258,350	6,495,680	1,553,256	4,476,948	5,846,237	3,263,668	3,496,780
2040	2,360,524	39,878	1,186,602	315,554	7,530,431	1,908,759	5,164,448	6,558,328	3,735,850	4,361,268
AARG										
1986-2000	1.6%	-0.6%	-0.7%	2.6%	2.0%	6.2%	3.2%	1.0%	2.3%	5.1%
1986-2040	1.3%	-0.3%	-0.3%	2.6%	1.7%	3.6%	2.0%	1.2%	1.7%	3.5%

EXHIBIT VII-2 continued

EAST KING COUNTY WATER DEMAND FORECAST (CCF)
SUMMARY

YEAR	SOOS CREEK	TRAILS END	UNCLAIMED	UNION HILL	W.D. #42	W.D. #83	W.D. #90	W.D. #107
1986	1,883,707	1,585	409,623	193,188	1,315,064	133,107	688,004	834,410
1990	2,039,290	1,679	438,773	241,237	1,231,546	129,435	675,084	814,972
2000	2,464,726	1,865	608,032	420,221	1,198,710	120,261	709,327	1,073,515
2010	2,998,505	2,054	800,034	617,327	1,192,346	116,512	763,732	1,310,456
2020	3,653,768	2,281	1,051,010	885,686	1,186,305	113,009	833,435	1,604,655
2030	4,369,339	2,508	1,327,632	1,178,981	1,179,997	109,534	909,921	1,925,334
2040	5,101,859	2,918	1,604,255	1,472,276	1,173,405	105,983	987,597	2,251,284
AARG								
1986-2000	1.9%	1.2%	2.9%	5.7%	-0.7%	-0.7%	0.2%	1.8%
1986-2040	1.8%	1.1%	2.5%	3.7%	-0.2%	-0.4%	0.6%	1.8%

EAST KING COUNTY WATER DEMAND FORECAST (CCF)
SUMMARY

YEAR	W.D. #119	W.D. #127	WILDERNESS RIM	WOODIN-VILLE	TOTAL CCF	TOTAL MGD
1986	54,770	91,411	66,361	1,805,487	30,171,270	62.00
1990	65,238	97,440	68,411	2,120,614	32,344,709	66.47
2000	87,472	134,863	88,715	3,370,424	39,706,284	81.59
2010	111,681	178,256	111,877	4,783,800	47,856,237	98.34
2020	141,754	235,138	140,722	6,823,222	58,478,010	120.17
2030	174,551	297,866	169,764	9,185,672	70,044,569	143.94
2040	207,891	360,594	198,807	11,605,787	81,779,407	168.05
AARG						
1985-2000	3.4%	2.8%	2.1%	4.6%	2.0%	2.0%
1986-2040	2.4%	2.5%	2.0%	3.4%	1.8%	1.8%

EXHIBIT VII-3

EAST KING COUNTY
COORDINATED WATER SYSTEM PLAN

WATER CONSERVATION PROGRAM ELEMENTS

A. PUBLIC EDUCATION

- o School Outreach
- o Speakers Bureau
- o Program Promotion
- o Theme Shows and Fairs

B. TECHNICAL ASSISTANCE

- o Single-Family/Multi-Family Kits
- o Purveyor Assistance/Customer Assistance
- o Home Water Audits
- o Technical Studies
- o Limit Unaccounted Water/Leak Detection
- o Nurseries/Agriculture
- o High Technology Meters
- o Bill Showing Consumption History

C. POLICY

- o Require Meters (including all public use, customer meters, and/or master source meters)
- o Plumbing Code
- o Landscape Management/Playfields
- o Seasonal Pricing/Inverted Rates
- o Irrigation/Private Wells
- o Utility Financed Retrofit
- o Master Source Meters

D. MERITING CONSIDERATION

- o Mandatory Seasonal Restriction
- o Recycling/Reuse
- o No Water for Golf Courses/Major Use
- o Conservation Program Performance Audit
- o Reduce Pressure to 45 psi

EXHIBIT VII-4

DEFINITION OF CONSERVATION ELEMENTS

For purposes of the recommended plan, program elements are defined as follows:

A. PUBLIC EDUCATION

1. School Outreach - Education program targeted at grades 4 through 6 to increase awareness of local water resources and encourage water conservation practices. Activities include school presentations, preparation of curriculum material, and tours of water utility facilities.

2. Speakers Bureau - Seeking speaking opportunities and making speakers available to a wide cross-section of service, community, and other groups. Provide speakers with audio and visual aids for presentations. Focus on increasing public awareness of water resource and conservation issues.

3. Program Promotion - Publicize the need for water conservation through television and radio public service announcements, news articles, and utility bill inserts.

4. Theme Shows and Fairs - Prepare a portable display of water conservation devices and selected written material. Staff this display at local area theme shows and fairs.

B. TECHNICAL ASSISTANCE

1. Single-Family/Multi-Family Kits - Distribute kits containing inexpensive, easily installed, water-saving devices to single-family residential homes and the owners and managers of apartment buildings and condominiums. Devices in the kits include shower flow restrictors, toilet tank water displacement bags, leak detection dye tablets, and an informational brochure.

2. Purveyor Assistance/Customer Assistance - Regional assistance to aid purveyors in developing and implementing conservation programs tailored to their needs. Similar response by purveyors to customers who request assistance in implementing water conservation practices.

3. Technical Studies - Studies would be designed and conducted by the utility and/or regional organization. Study objectives would be to collect data and research new technology to develop programs which would

produce measurable water savings. Study areas might include residential flow metering, lawn watering practices, and commercial/industrial water use patterns.

4. Unaccounted Water/Leak Detection - Conduct a regular and systematic program of finding and repairing leaks in system mains and laterals. This includes on-site tests using computer-assisted leak detection equipment on water distribution mains, valves, services, and meters.

5. Nurseries/Agriculture - Apply current technology to water use practices of large agriculture/irrigation operations. Examples are nurseries and park department facilities. Moisture sensors, flow timers, low volume sprinklers, drip irrigation, and other practices to increase irrigation efficiency would be implemented.

6. Bill Showing Consumption History - An extension of the electric energy conservation program. Billings would show percentage increase/decrease in water use over the same period in the previous year.

7. High Technology Meters - Utilize concepts of telemetry and exception reporting to detect and investigate instances of abnormal water usage.

C. POLICY

1. Require Meters - Require the installation of individual service or master source meters (at discretion of utility) for all water use, including public facilities. Maintain periodic meter testing and repair program.

2. Plumbing Code - Develop recommendations for Code revisions to require water efficient fixtures for new construction and extensively remodelled buildings. Work with County and State officials for adoption.

3. Landscape Management/Playfields - Promote low water demand landscaping in all retail customer classes (private, public, commercial, industrial, etc.). Work with local nurseries to ensure the availability of plants that achieve this objective.

4. Seasonal Pricing/Inverted Rates - Implement rate design techniques to provide economic incentives to conserve water. Under seasonal pricing, the unit price of water would be increased during a high seasonal use period. Under an inverted rate, the customer pays a specific charge for an initial quantity of water and a greater charge for succeeding quantities.

5. Irrigation/Private Wells - Identification of location, aquifer source, average annual, and peak month usage to analyze impact on supply and evaluate availability for municipal use where land use changes occur.

General purpose government would be encouraged to monitor use and consider land use and building code conditions that would promote efficient use of water from these sources. All wells above a specified capacity should be required to be metered with use records available for resource management.

6. Utility Financed Retrofit - Under a program similar to that used in the electrical energy program, installation of water efficient fixtures in existing residences and commercial/ industrial facilities would be promoted by the utility by: (a) providing fixtures at no cost, (b) giving a rebate for consumer purchased fixtures, and (c) arranging for suppliers to provide fixtures at the utility's cost.

7. Master Source Meters - Require a master source meter, at a minimum, for Base Program utilities.

D. MERITING CONSIDERATION

1. Mandatory Seasonal Restriction - Implement and enforce restrictions in water use during peak demand periods in all categories of consumers under an adopted strategy/plan.

2. Recycling/Reuse - Examine opportunities for water reuse and recycling as an approach to reducing water demands. Potential program areas include:

   - o Reuse of reclaimed municipal wastewater for the irrigation of public green space, industrial cooling, and power plant cooling.
   - o On-site wastewater treatment and recycling of effluent for non-potable uses in commercial buildings.
   - o Utilization of gray water (bath, lavatory, and clothes washing water) for non-potable uses.

3. No Water For Golf Courses/Major Use - In future siting of golf courses and other large water consuming facilities, or where the location of such existing facilities warrants, allow only the use of reclaimed wastewater.

4. Conservation Program Performance Audit - To evaluate the efficiency and effectiveness of a utility conservation program, an entity such as the Regional Water Association or the County shall routinely conduct a program performance audit and report its findings to the utility.

5. Reduce Pressure to 45 psi - In service areas with excessive pressure (as determined by the utility) require pressure reducing valves on service connections.

EXHIBIT VII-5

EAST KING COUNTY COORDINATED WATER SYSTEM PLAN
RECOMMENDED WATER CONSERVATION PROGRAM

Element (4)	Program Elements						Reduction In Water Use(8)		
	Comprehensive (1)		Moderate (2)		Base (3)		Comp.	Mod.	Base
	Utility	Region	Utility	Region	Utility	Region	%	%	%
A. Public Education							1	1 (9)	1 (9)
1. School Outreach		X		X		X			
2. Speakers Bureau	X	X (5)		X		X			
3. Program Promotion	X	X	X	X	X	X			
4. Theme Shows and Fairs	X	X		X		X			
B. Technical Assistance							4	3.5	2
1. Single-Family/Multi-Family Kits	X	X	X	X		X			
2. Purveyor Assistance/Customer Assistance	X	X	X	X		X			
3. Technical Studies	X	X		X					
4. Limit Unaccounted Water/Leak Detection	X	X	X						
5. Nurseries/Agriculture	X	X	X	X		X			
6. Bill Showing Consumption History	X		X						
7. High Technology Meters	X								
C. Policy							3	2	1
1. Require Meters (including all public use, customer meters, and/or master source meters)	X		X						
2. Plumbing Code		X (6)		X		X			
3. Landscape Management/Playfields	X	X	X	X					
4. Seasonal Pricing/Inverted Rates	X	X	X						
5. Irrigation/Private Wells	X	X		X		X			
6. Utility Financed Retrofit	X								
7. Master Source Meters					X				
D. Meriting Consideration (7)									
1. Mandatory Seasonal Restriction	X								
2. Recycling/Reuse	X								
3. No Water for Golf Courses/Major Use	X								
4. Conservation Program Performance Audit		X							
5. Reduce Pressure to 45 psi	X		X						

(1) Cities with 10,000 or more water customers.
(2) Cities with fewer than 10,000 customers and all other water utilities serving 500 or more customers.
(3) Water utilities with less than 500 customers.
(4) Implementation of program elements assumed to be initiated by the year 1990.
(5) Where both a utility and regional program are indicated, it is intended that the utility program is lead and the regional program supportive.
(6) Code to be established at state and/or county level.
(7) Elements recommended for further consideration on an optional basis.
(8) Percent reduction assumed to be achievable by the year 2000.
(9) Regional public education program assumed to be equal to the combined utility/regional program under Comprehensive.

SECTION VIII

SECTION VIII

EXISTING SYSTEM SUPPLY CAPACITY

1. EVALUATION OF FACILITIES

A. Introduction

It is reported in the November, 1986, Preliminary Assessment of Water Supply and Fire Protection in King County, prepared by the King County Department of Planning and Community Development, that over 1,500 water service organizations of various sizes and capabilities exist in the County (based upon November, 1984, data). The data reported, together with the addition of information on the number of systems in the East King County study area (November, 1988, data), are as follows:

Water System Statistics

Class of System	Number of Systems EKC	Number of Systems County	Total County Population	Percent of County Population by System
1	38	87	1,335,255	98.0
2	55	129	15,348	1.0
3	44	80	not avail.	0.4
4	538	1,299	9,229	0.6
TOTAL	675	1,595	1,359,832	100.0

From this tabulation, it is clear that the majority of the East King County population served by public systems receive their supply from the Class 1 and 2 utilities.

Early in the study process, Economic and Engineering Services, Inc. (EES), in consultation with the Data Base/Planning Data Subcommittee, directed a detailed questionnaire on system facilities to all Class 1 utilities and those Class 2 utilities serving 50 or more connections. This questionnaire requested data and information on comprehensive plan status, customers served, water source, installed pumping/diversion capacities, water rights, system facilities, and fire flow. Copies of most recent water comprehensive plans were also requested.

Concurrent with the compilation and analysis of this system data, future service area boundaries were being established and future water demand was being forecast. Once these three tasks were essentially completed, an analysis was undertaken to assess the capability of the larger systems to serve from existing sources, the needs of current and future customers. This assessment was conducted by ST Engineering, Inc., P.S., municipal engineering consultants. It was limited to 29 of the larger Class 1 utilities. The full text of the May, 1989, report, prepared by ST Engineering, titled, "Assessment of System Capabilities to Meet Existing and Projected Needs" is contained in Appendix H. A summary is provided in the following subsections.

B. Existing Facilities

Information for the 29 Class 1 systems is presented in Table VIII-1, Inventory of System Information. This information was obtained from the Washington State Department of Social and Health Services (DSHS) files, recent water system comprehensive plans, questionnaires, and personal interviews. The water systems in this Table are divided alphabetically into two groups, as Class 1 systems with greater than 1,000 connections and Class 1 systems with less than 1,000 connections. Each of the water systems is further identified with the DSHS identification number, as well as the date of its last comprehensive plan preparation. The items listed for evaluation on each water system are supply source, installed supply capacity, water treatment, fire flow capability, storage, and any present or planned interties.

The supply source can be classified into two groups, Seattle Water Department (SWD) and local groundwater sources (generally wells). The SWD supplies the eastside area from two surface water sources, the Cedar River watershed with a reservoir at Chester Morse Lake and the Tolt River watershed with a reservoir on the Tolt South Fork. The East King County purveyors in this study are presently purchasing 48 MGD out of a total of approximately 64 MGD supplied to all contractual users by SWD. The SWD treats this supply with both fluoride and chlorine, thereby relieving most of their contract users from treating the purchased water. The Cedar River watershed has the best quality and, at present, supplies about two-thirds of the quantity.

Local groundwater sources (wells) supply the remainder of the Eastside water systems. These wells draw water from local wells within the systems service area. This groundwater is supplying approximately 22 MGD to the East King County Regional Water Study Area, of which approximately 12 MGD is treated. As shown on Table VIII-1, most of

the systems using wells have less than 1,000 customers. This is very typical of the development of water systems which, in the beginning as a small community, can be supplied from one or two wells but, with extensive population growth, soon outstrip their local well field capacity and must seek a regional supply.

Fire flow capacity is also shown on this Table. The fire flow capacity of a water system not only projects its ability for fire protection but is a direct indication of the main size within its network. A larger fire flow capability would indicate larger main sizes and better transmission capabilities. Large fire flow capabilities, such as 4,000 to 6,000 gpm, indicate a fire within the largest structure, generally a school or church, can be extinguished.

Storage capacity is also shown on this Table. The storage capabilities of a water system can generally be regarded as the system's emergency source of water. This emergency source may provide additional water for a fire or other peak use or be used as a backup should the primary supply fail. The present storage capacity of the East King County water systems is approximately 180 million gallons. This could conceivably provide water for 2.3 days, should a major catastrophe occur.

Present and planned interties are also shown on this Table. Some of the present interties, such as Rose Hill, Redmond, and Kirkland, are for water supply; however, most of the interties are for emergency or peak demand use. The outward expanding development of most water systems has precluded efficient hydraulic compatibility with adjoining water systems and, therefore, allowed only a limited use. Efficient use of interties, as in the "wheeling" of water, could only have been accomplished with an early coordinated regional effort.

C. Future Demand

Projections for future demand have been determined and are shown in Table VIII-2, System Quantity Analysis. This Table identifies the total supply excess or deficiency for each of the major purveyors in the East King County CWSP area. This Table is divided into two parts, the first part is for the water systems served by SWD and the second part is for the water systems served by other sources (groundwater).

The source requirements section for both the present and future demand in this Table have been obtained from the East King County Regional Water Demand Forecast (October, 1988), prepared by EES. It should be noted that the Cities of Carnation, North Bend, and Snoqualmie, Water District No. 122, and Sallal Water Association have been extracted from this grouped section of the Regional Demand Forecast.

The installed capacity section in this Table has been obtained from DSHS records, questionnaires returned from each purveyor, recent water system comprehensive plans, and personal interviews. The excess or shortage for the years 2000, 2010, 2020, and 2040 have been obtained by using the present day installed capacity and not by using proposed improvements (such as a future well) as shown in the individual water system comprehensive plans. By doing so, a true future excess or shortage can be shown as if the water systems relied solely on the facilities they are using today.

It should be noted that data for peaking flow for the SWD and the groundwater sources are not compatible. Well sources typically report the maximum or instantaneous capacity of the well pump. For purposes of this analysis, each rated pump capacity was reduced to an average capacity by use of the maximum day peaking factor found in each comprehensive plan. The SWD data represents average day requirements. It is assumed that present needs are fully met by SWD for its wholesale customers and that year 2000 requirements are measured by average day needs. For these reasons, a dash is shown in the timetable where data are not pertinent.

A summary of the total deficit and surplus of capacity for the 29 systems listed in Table VIII-2 is as follows (shortages are shown by numbers in parenthesis):

Supply Excess or Shortage
(Annual Average MGD)

	Year			
Served By	2000	2010	2020	2040
SWD	(12.43)	(23.89)	(38.23)	(70.17)
Other Sources	3.05	(1.87)	(8.37)	(21.81)
TOTAL	(9.38)	(25.76)	(46.6)	(91.98)

Viewing the above analysis from a regional perspective, the following conclusions can be reached:

- Shortages in the decade of the 1990s are forecast among the SWD wholesale customers. The SWD is presently developing two well fields (Highline and Tolt) which should offset the shortage at least to the year 1997.

- Some individual utilities not served by the SWD are forecast to experience shortages in the 1990s. These include Sammamish Plateau, Issaquah, Northeast Sammamish, and Union Hill.

- o In the decade of the 2000s and beyond, shortages will generally occur for both the SWD wholesale customers and those served by other sources.

- o Many of the non-SWD served utilities are forecast to have a surplus of supply well into the study period. If water is wheeled from the utilities with surplus to those with shortages, the need for development of new sources is delayed. However, this objective is not practical or probable. Not all water would be available for transfer because of physical or legal limitations.

- o The regional shortage by the year 2040 will be in the range of 80 to 100 MGD. This represents more than a doubling of the current use.

2. WATER RIGHTS

Having adequate water rights is a requisite for regional water supply development and planning. Being able to acquire new water rights is a necessary component of new source selection and development.

Information for the water right tabulations presented in Tables A, B, and C of Appendix I has been primarily obtained from the water right printout records, dated April 20, 1988, and the water right claims registry of the Department of Ecology (Ecology). As indicated previously, the large majority of the East King County population served by public systems are served by Class 1 and 2 public water supply systems, as designated by DSHS. Therefore, the water right listing has been limited to these larger systems. The in-service capacity figures have been derived first from utility questionnaire responses (where available) and then from water comprehensive plans and DSHS Water Facility Inventory information printouts.

Table A of Appendix I is a tabulation of Class 1 public water supply systems that, with the exception of Renton and King County Water District No. 83, receive essentially all their water from the SWD system. SWD's water rights are not listed in the Table because the City of Seattle is not within the East King County study area. SWD's primary sources of water supply are the South Fork Tolt River (water right permit No. 10602) and the Cedar River (water right claim Nos. 103129 and 103130). Of particular note are the several utilities that do have water rights of record, but are not using them. The retention of unused water rights, where there are no plans to put the water source back in service, distorts the water right comparisons to the actual use and demands of a utility.

Table B of Appendix I includes all the remaining Class 1 systems that were not included in Table A; and, Table C is a tabulation of Class 2 public water supply systems.

The water right analysis generally has shown a poor correlation between reported system capacities and the related water right(s). The major conclusion/recommendation from the analysis is that each of the individual utilities should carefully review its water right(s) to assure adequacy and correctness.

The analysis has shown inconsistencies among the data sources. Also, in comparing the reported in-service capacity with Ecology's water right data, situations were found where the "reported" pumping rate exceeded the water right authorization. In other instances, no water rights nor claims to water rights, have been identified for some existing systems. This was particularly true in the case of Class 2 systems. This does not necessarily mean there is no water right for the system. Because name changes in Ecology records do not generally follow ownership changes of water rights (except in application or permit status), the inability to match a water right or claim to each water system is not uncommon.

Summaries of the in-service capacity and water right data are shown on Table VIII-3 for the Class 1 and 2 systems.

TABLE VIII-1
INVENTORY OF SYSTEM INFORMATION

System Name	DOH ID #	Class	Date of Comp Plan	Supply Sources	Source Capacity (MGD) (1) Avg.	Source Capacity (MGD) (1) Peak	Water Treatment (2)	Fire Flow (GPM) (3)	Storage (MG) (4)	Interties Present	Interties Planned	Comments
Bellevue	05575B	1	1985	SWD	14.93	14.93	None	1000-6000	26.90 (6)	Redmond, WD 17, WD 117, Rose Hill	Redmond	Recommendations include improvement of Grid in Central Business District for additional fire protection. System in excellent condition.
Bothell	07900L	1	1980	SWD	0.98	0.98	None	1000-4000	6.65	NELWSWD, Woodinville	Alderwood	System in good condition with only minor looping necessary.
Cedar River	418007	1	1982	SWD	1.31	1.31	None	2000-3500	5.50	WD 108	Renton, WD 58	System in good condition, however eastern area will require improvement in grid for required fire protection.
Issaquah	363505	1	1987	Risdon Well #1	0.37	0.86	None	1000-4500	4.37	None	Sammamish Plateau	City maintains abandoned spring watershed rights. Wells No. 4 and 5 drilled for future use. Wells No. 4 and 5 have a combine capacity of 1.8 MGD. System in good condition.
				Risdon Well #2	0.69	1.58	None					
				Gun Club Well #3	0.19	0.43	None					
Kirkland	42250T	1	1984	SWD	2.29	2.29	None	1000-1800	6.35 (6)	Roseh11	Bellevue	System in good condition. Breaks/leaks in AC pipelines may require rehabilitation program.
KCWD #42	39600E	1	1982	SWD	2.69	2.69	None	1000-4000	4.10	WD #83	NELWSWD	Additional 1.5 MG of storage required. No major transmission lines required. System in excellent condition.
KCWD #90	41150L	1	1984	SWD	1.41	1.41	None		7.12			
KCWD #107	41750C	1	1986	SWD	1.71	1.71	None	1000-6000	13.00	Bellevue	Renton	System in good condition.
Mercer Island	536405	1	1981	SWD	2.96	2.96	None	2000-7000	8.00	Shorewood, Mercer Crest	None	System in excellent condition
NE Lake Washington	408005	1	1980	SWD	5.94	5.94	None	1000-6000	23.90	To WD#3, WD 104 Bothell	Rose Hill, WD 42	District nearing completion of steel watermain replacement program. System in excellent condition.
NE Sammamish	75265X	1	1983	Well No. 2	0.08	0.25	None	1500	1.80	Sammamish Plateau	None	Well No. 1 (.25 MGD) sold to Sahalee Country Club. System in good condition.
				Well No. 3	0.27	0.86	None					
				Well No. 4	0.27	0.86	None					
North Bend	60100A	1	1985	Mt. Si Spring	1.40	3.24	Yes-CL2	1000-3500	0.50	Sallal	Snoqualmie	Spring has additional 2.58 MGD capacity. The city has water rights for 3.24 MGD. Pump has 2.16 MGD capacity. System in good condition.
Redmond	71650B	1	1983	Well #1	0.54	1.21	Yes-FL, CL2	1500-5000	10.70	Union Hill, Rose Hill, Bellevue	None	Treatment required for corrosive water in well system. SWD indicates that 6.5 MGD will be made available to Redmond. System in good condition.
				Well #2	0.28	0.63	Yes-FL, CL2					
				Well #3	0.22	0.49	Yes-FL, CL2					
				Well #5	0.59	1.33	Yes-FL, CL2					
				SWD (Rose Hill)	0.86	0.86	None					

TABLE VIII-1 continued
INVENTORY OF SYSTEM INFORMATION

System Name	DOH ID #	Class	Date of Comp Plan	Supply Sources	Source Capacity (MGD) (1) Avg.	Source Capacity (MGD) (1) Peak	Water Treatment (2)	Fire Flow (GPM) (3)	Storage (MG) (4)	Interties Present	Interties Planned	Comments
Renton	71850L	1	1993	Spring Brook Springs	0.98	2.00	Yes-FL, CL2	1000-4500	13.95	None	Soos Creek	Well No. 4 and 5 not in use, however water rights remain active and wells capable of producing 1.0 MGD. System in good condition.
				Liberty Pk Well#2	2.12	4.32	Yes-FL, CL2					
				Liberty Pk Well#3	1.13	2.30	Yes-FL, CL2					
				Well #8	2.47	5.04	Yes-FL, CL2					
				Well #9	0.88	1.80	Yes-CL2					
				SWD	1.34	1.34	None					
Rose Hill	40850E	1	1982	SWD	2.97	2.97	None	1000-6000	12.70	Redmond, Kirkland, Bellevue	NELWSWD	District commencing with watermain replacement program. Additional BMG storage recommended. System in excellent condition.
Sammamish Plateau	409009	1	1980	Well #1	0.07	0.17	None	1000-4000	4.30	NE Sammamish	Issaquah	System in excellent condition. Wells have minor hydrogen sulfide problem.
				Well #2	0.11	0.26	None					
				Well #4	0.21	0.50	Yes-CL2					
				Well #5	0.21	0.50	Yes-CL2					
				Well #6	0.14	0.34	Yes-CL2					
				WELL #7 & 8	0.91	2.18	None					
Soos Creek	401008	1	1988	SWD	3.86	3.86	None	1000-4000	14.55	None	KCWD #111, Renton, Kent, Cedar River	System in excellent condition. Recommendations include improving supply.
Union Hill	902603	1	1975	Well	0.53	1.22	None	1250-3000	1.44	From Redmond	None	System in good condition.
Woodinville	41600Y	1	1984	SWD	3.70	3.70	None	1000-6000	9.10	NELWSWD	Bothell	Pursuing joint construction of storage facilities with Bothell. Recent Hydraulic Analysis update indicate rapid development and higher consumption rate. System in good condition.
Aees Lake	020550	1(5)	1984	Well # 1	0.05	0.09	None	1000	0.907			System in adequate condition.
				Well #1-A	0.11	0.22	None					
				Well #2	0.02	0.05	Filt (Fe/Mg)					
				Well #3	0.01	0.02	None					
				Well #4	0.01	0.01	None					
Carnation	112008	1(5)	1974	Well No. 1	0.40	1.01	None	1000	0.00	None	None	Two 250,000 gallon reservoirs under construction.
				Carnation Spring	0.26	0.65	Yes-CL2					System in adequate condition.
Duvall	207508	1(5)	1987	SWD	0.15	0.15	None		0.10			System in adequate condition.
KCWD #83	40950K	1(5)	1984	SWD	0.27	0.76	None	1000-3500	0.50	WD #42	NELWSWD	Intertie agreement with WD #42 allows the use of storage for fire protection. Settlement tank in use due to pumping of sand by wells. Old well #3 abandoned.
				Well No. 1	0.15	0.44	None					System in adequate condition.
				Well No. 2	0.21	0.60	None					
				Well No. 3	0.15	0.43	None					

TABLE VIII-1 continued
INVENTORY OF SYSTEM INFORMATION

System Name	DSHS ID #	Class	Date of Comp Plan	Supply Sources	Source Capacity (MGD) (1) Avg.	Source Capacity (MGD) (1) Peak	Water Treatment (2)	Fire Flow (GPM) (3)	Storage (MG) (4)	Interties Present	Interties Planned	Comments
KCWD #119	419850	1(5)	1983	SWD	0.11	0.11	None	1250	0.20	None	Carnation Duvall	District contracts maintenance with sub-contractor. System in adequate condition.
KCWD #122	419958	1(5)	1986	Well No. 1	0.15	0.29	None	1000	0.07	None	Union Hill, Ames Lake	Joint storage with Ames Lake proposed to eliminate fire reserve shortage. System in adequate condition.
KCWD #127	245508	1(5)	1982	Well #1	0.33	0.65	None		0.51			System in adequate condition.
				Well #2	0.43	0.86	None					
				Artesian	0.01	0.02	None					
Mirrormont Services	552501	1(5)	1985	Well #1	0.06	0.12	None	1000	0.28	None	None	System in adequate condition.
				Well #2	0.06	0.12	None					
				Well #3	0.02	0.04	None					
				Well #4	0.03	0.06	None					
				Tiger Mountain Spring	0.06	0.12	None					
Sallal	755608	1(5)	1979	Well #1	0.58	1.15	None	1000-4000	0.54	None	North Bend	Connection to SWD recently terminated.
				Well #2	0.58	1.15	None					System in adequate condition.
				Well #3	0.07	0.14	None					
Snoqualmie	810806	1(5)		Canyon Springs	0.51	0.86	None		0.50		North Bend	System in adequate condition.
				Well No. 1	0.35	0.58	None					
			TOTAL SOURCE CAPACITY		65.41	90.02						
								TOTAL STORAGE CAPACITY	178.54			

Footnotes:

1. Instantaneous capacity of installed facilities at source. For Seattle Water Department (SWD) supply, average and peak day capacity is derived from 1986 annual use. For major supply planning SWD makes no distinction between average and peak day demand. For purposes of this analysis, each rated pump capacity was reduced to an average capacity by use of the maximum day peaking factor found in each comprehensive plan.
2. The SWD treats water supplied to contractual purveyors. Both CL2 and FL are added at the source. Subsequently most of these contractual purveyors do not treat the supply from the SWD.
3. The minimum fireflows required by statute are: Residential - 500 gpm for 30 minutes
   Commercial - 750 gpm for 60 minutes
   Industrial - 1000 gpm for 60 minutes
4. The storage indicated includes both working and dead storage.
5. These purveyors are class 1 systems with less than 1000 customers.
6. Bellevue, Kirkland, and Rose Hill share an additional 11.9 MG of storage. Sammamish Plateau and NE Sammamish share an additional 3.0 MG of storage. This is additional storage and not shown in total storage capacity.
7. Average daily source capacity was calculated from water use data provided by Sammamish Plateau.

TABLE VIII-2
SYSTEM QUANTITY ANALYSIS

System Name	DOH ID #	Class	Source	Source Requirements (1) (MGD)							Installed Capacity (2) (MGD)		Supply Excess or Shortage (3) (MGD)						Comments
				Present		2000		2010	2020	2040	Present		Present		2000 (4)		2010	2020	2040	
				Avg.	Peak	Avg.	Peak	Avg.	Avg.	Avg.	Avg.	Peak	Avg.	Peak	Avg.	Peak	Avg.	Avg.	Avg.	
Served by Seattle Water Department (SWD)																			
Bellevue	05575B	1	SWD	14.93	14.93	16.90	16.90	18.49	20.30	24.17	14.93	14.93	--	--	(1.97)	--	(3.56)	(5.37)	(9.24)	
Bothell	07900L	1	SWD	0.98	0.98	1.51	1.51	1.95	2.55	3.90	0.96	0.96	--	--	(0.53)	--	(0.95)	(1.57)	(2.92)	
Cedar River	418007	1	SWD	1.31	1.31	2.29	2.29	3.19	4.49	7.46	1.31	1.31	--	--	(0.98)	--	(1.88)	(3.18)	(6.15)	
KCWD 0107	41750C	1	SWD	1.71	1.71	2.20	2.20	2.69	3.29	4.61	1.71	1.71	--	--	(0.49)	--	(0.98)	(1.58)	(2.90)	One 1.0 MGD artesian well approved.
KCWD 042	39600E	1	SWD	2.69	2.69	2.46	2.46	2.44	2.43	2.40	2.69	2.69	--	--	0.23	--	0.25	0.26	0.29	
KCWD 083 (6)	40950K	1	SWD(6)	0.03	0.03	0.03	2.46	0.02	0.02	0.02	0.03	0.03	--	--	0.00	--	0.01	0.01	0.01	
KCWD 090	41150L	1	SWD	1.41	1.41	1.45	0.03	1.57	1.71	2.02	1.41	1.41	--	--	(0.04)	--	(0.16)	(0.30)	(0.61)	
Kirkland	42250T	1	SWD	2.29	2.29	2.87	2.87	3.30	3.81	4.84	2.29	2.29	--	--	(0.58)	--	(1.01)	(1.52)	(2.55)	
Mercer Island	53640S	1	SWD	2.96	2.96	2.68	2.68	2.61	2.55	2.43	2.96	2.96	--	--	0.28	--	0.35	0.41	0.53	
N.E.Lake Washington	40800S	1	SWD	5.94	5.94	7.81	7.81	9.35	11.24	15.43	5.94	5.94	--	--	(1.87)	--	(3.41)	(5.30)	(9.49)	Studies indicate local wells could supply 4.3 MGD.
Redmond (6)	71650B	1	SWD(6)	1.69	1.69	2.62	2.62	3.12	3.74	5.08	1.69	1.69	--	--	(0.93)	--	(1.43)	(2.05)	(3.39)	
Renton (6)	71850L	1	SWD(6)	1.34	1.34	1.55	1.55	1.80	2.10	2.69	1.34	1.34	--	--	0.21	--	(0.46)	(0.76)	(1.35)	
Rose Hill	40850E	1	SWD	2.97	2.97	4.09	4.09	4.85	5.74	7.66	2.97	2.97	--	--	(1.12)	--	(1.88)	(2.77)	(4.69)	Provides supply for Kirkland and Redmond.
Soos Creek	40100B	1	SWD	3.86	3.86	5.05	5.05	6.14	7.49	10.46	3.86	3.86	--	--	(1.19)	--	(2.28)	(3.63)	(6.60)	
Woodinville	41600Y	1	SWD	3.70	3.70	6.91	6.91	9.80	13.98	23.78	3.70	3.70	--	--	(3.21)	--	(6.10)	(10.28)	(20.08)	
Duvall	20750B	1 (5)	SWD	0.15	0.15	0.32	0.32	0.43	0.57	0.86	0.15	0.15	--	--	(0.17)	--	(0.28)	(0.42)	(0.71)	
KCWD 0119	41985O	1 (5)	SWD	0.11	0.11	0.18	0.18	0.23	0.29	0.43	0.11	0.11	--	--	(0.07)	--	(0.12)	(0.18)	(0.32)	Resistivity survey indicates 1.1 MGD well possible.
Served by Other																			
Issaquah	36350S	1	3-Wells	1.23	2.83	2.10	4.83	2.66	3.37	4.83	1.25	2.87	0.02	0.04	(0.85)	(1.96)	(1.41)	(2.12)	(3.58)	
North Bend	60100A	1	1-Spring	0.21	0.49	0.33	0.76	0.45	0.59	0.89	1.40	3.24	1.19	2.75	1.07	2.48	0.95	0.81	0.51	
N.E. Sammamish	75265X	1	3-Wells	0.55	1.78	1.28	4.13	1.77	2.45	3.91	0.61	1.97	0.06	0.19	(0.67)	(2.16)	(1.16)	(1.64)	(3.30)	
Redmond	71650B	1	5-Wells	1.83	4.12	2.83	6.38	3.39	4.05	5.50	2.94	5.53	1.11	1.41	0.11	(0.85)	(0.45)	(1.11)	(2.56)	
Renton	71850L	1	16-W;1-S	5.37	10.97	6.22	12.70	7.19	8.42	10.75	7.58	15.46	2.21	4.49	1.36	2.76	0.39	(0.84)	(3.17)	Instream Resource Protection Pgm. limits well yield.
Sammamish Plat	40900S	1	7-Wells	1.29	3.09	2.58	6.18	3.71	5.38	8.94	1.65	3.96	0.36	0.86	(0.93)	(2.22)	(2.06)	(3.73)	(7.29)	
Union Hill	90260J	1	1-Well	0.40	0.90	0.86	1.94	1.27	1.82	3.02	0.53	1.22	0.13	0.32	(0.33)	(0.72)	(0.74)	(1.29)	(2.49)	
Ames Lake	02055O	1 (5)	5-Wells	0.12	0.24	0.24	0.48	0.34	0.49	0.81	0.20	0.39	0.08	0.15	(0.04)	(0.09)	(0.14)	(0.29)	(0.61)	
Carnation	11200B	1 (5)	1-W;1-S	0.19	0.48	0.29	0.73	0.39	0.52	0.79	0.40	1.01	0.21	0.53	0.11	0.28	0.01	(0.12)	(0.39)	
KCWD 0122	41995B	1 (5)	1-Well	0.03	0.06	0.04	0.08	0.05	0.07	0.11	0.15	0.29	0.12	0.23	0.11	0.21	0.10	0.08	0.04	Present wellfield capable of 0.60 MGD yield.
KCWD 0127	24550B	1 (5)	3-Wells	0.19	0.38	0.28	0.56	0.37	0.48	0.74	0.77	1.53	0.58	1.15	0.49	0.97	0.40	0.29	0.03	
KCWD 083	40950K	1 (5)	3-Wells	0.24	0.47	0.22	0.70	0.22	0.21	0.20	1.74	4.87	1.50	4.20	1.52	4.17	1.52	1.53	1.54	
Mirrormont Services	55250I	1 (5)	4-W;1-S	0.16	0.32	0.23	0.46	0.31	0.41	0.65	0.23	0.46	0.07	0.14	0.00	0.00	(0.08)	(0.18)	(0.19)	
Sallal	75560G	1 (5)	2-Wells	0.24	0.48	0.37	0.74	0.50	0.66	1.00	1.22	2.44	0.98	1.70	0.85	1.70	0.72	0.56	0.22	
Snoqualmie	81080C	1 (5)	1-W;1-S	0.31	0.62	0.47	0.94	0.64	0.84	1.29	0.72	1.44	0.41	0.82	0.25	0.50	0.08	(0.12)	(0.57)	
TOTAL SUPPLY EXCESS OR SHORTAGE													9.03	18.98	(9.38)	5.07	(25.76)	(46.60)	(91.98)	

Footnotes:

(1) Present Requirement reported as 1986 use. Future requirements obtained from Regional Water Demand Forecast or Individual Utility Comprehensive Plans.

(2) Instantaneous capacity of installed facilities at source. For SWD supply, Average and Peak Day capacity is derived from 1986 Annual use. For major supply planning SWD makes no distinction between average & peak day demand.

(3) Supply shortage shown in brackets.

(4) It is anticipated that with the addition of the Highline and Tolt well fields the source requirements for the year 2000 will be met by the SWD and that shortage shown for SWD wholesale customers will actually be met.

(5) These purveyors are a class 1 system with less than 1000 customers.

(6) Portions served by other sources.

TABLE VIII-3

SUMMARIES OF CLASS 1 AND 2 SYSTEMS (1)
IN-SERVICE CAPACITY AND WATER RIGHTS

	In-Service Capacity (2)		Water Right		
	GPM	MGD	Inst.	MGD	AF/YR
Class 1					
Served by Seattle Water Dept.					
KCWD No. 42 (3)					
KCWD No. 83 (4)	1,000	1.44	765	1.09	866
KCWD No. 90 (3)					
KCWD No. 107 (3)					
KCWD No. 119 (3)					
Bellevue, City of (3)			337	0.48	30
Bothell, City of (3)			200	0.29	320
Cedar River W&S (3)					
Duvall, City of (3)			65	0.09	36
Kirkland, City of (5)			1,823	2.63	1,420
Mercer Crest Water Assn. (3)					
Mercer Island, City of (3)					
NE Lake Washington W&S (3)			1,000	1.44	1,100
Renton, City of (4)	14,400	20.72	15,152	21.81	13,160
Rose Hill W&S Dist. (3)					
Soos Creek W&S Dist. (3)					
Woodinville Water Dist. (3)					
TOTAL	15,400	22.16	19,342	27.83	16,932

TABLE VIII-3 continued

	In-Service Capacity (2)		Water Right		
	GPM	MGD	Inst.	MGD	AF/YR
Class 1 not Served by Seattle Water Dept.					
Ames Lake Water Assn.	370	0.54	280	0.41	340
Beaux Arts, City of	80	0.12	150	0.22	100
Carnation, City of	1,150	1.65	800	1.15	538
Issaquah, City of	1,975	2.84	3,880	5.59	2,800
KCWD No. 1, Yarrow	286	0.41	Unk.(8)	Unk.	Unk.
KCWD No. 122 (Cascade View)	200	0.28	200	0.28	120
KCWD No. 127	762	1.10	1,114	1.60	806
Maplewood Add. Water Coop.	400	0.58	400	0.58	56
Mirrormont Services, Inc.	430	0.62	195	0.28	168
North Bend, City of	2,250	3.24	2,250	3.24	336
NE Sammamish S&W Dist.	1,575	2.27	2,070	2.97	2,016
___erdale Park Water Assn.	200	0.29	240	0.34	110
Redmond, City of	2,490	3.59	5,930	8.54	3,485
Riverbend Homesites	530	0.76	1,000	1.44	561
Riverbend Mobile Home Park	400	0.58	268	0.39	120
Sallal Water Assn., Inc.	1,700	2.44	1,600	2.30	696
Sammamish Plateau W&S Dist.	6,600	9.55	6,450	9.28	4,936
Shorewood Apartments (3)					
Snoqualmie, City of	1,000	1.44	2,080	3.00	700
Union Hill Water Assn. (6)	850	1.22	1,300	1.87	2,080
Wilderness Rim Maint. Coop. (7)					
TOTAL	23,248	33.52	30,207	43.48	19,968

TABLE VIII-3 continued

	In-Service Capacity (2)		Water Right		
	GPM	MGD	Inst.	MGD	AF/YR
Class 2					
Alpine Mobile Manor			10	0.01	13
Avon Villa Trailer Park	35	0.05	Unk.	Unk.	Unk.
Blue Sky II Mobile Home Pk.	30	0.04	Unk.	Unk.	Unk.
Compton Water Supply			Unk.	Unk.	Unk.
Carnation Farms			200	0.29	40
Cedar Grove Mobile Home Pk.	40	0.06	Unk.	Unk.	Unk.
Cedar Heights Water Dist.	50	0.07	Unk.	Unk.	Unk.
Dawnbreaker Water Assn.	55	0.08	55	0.08	24
Dorre Don Water System	100	0.14	199	0.28	40
Echo Glen Childrens Center	200	0.29	200	0.29	82
Edgehill Water Assn.	115	0.17	115	0.17	91
Elderwood	25	0.04	Cl.(9)	Cl.	Cl.
Evergreen Heights Water Coop. Assn.	38	0.05	Unk.	Unk.	Unk.
Forest Grove Hills	27	0.04	Unk.	Unk.	Unk.
Four Creeks Ranch Rd. Water	90	0.13	60	0.09	30
Four Lakes	165	0.24	150	0.22	82
Gesell Addition	250	0.36	250	0.36	27
Greenacres Water Assn.	40	0.06	Unk.	Unk.	Unk.
Hartman Water	10	0.01	Cl.(9)	Cl.	Cl.
Heathercrest, Plat of	150	0.22	130	0.19	40
Inglewood Park Water Co.	100	0.14	45	0.06	18
Issaquah Valley Water Assn.	55	0.08	122	0.17	21
KCWD No. 17 (10)					
KCWD No. 117 (11)			Unk.	Unk.	Unk.
KCWD No. 123	200	0.29	125	0.18	90
Lake Margaret Water System	120	0.19	200	0.29	135
Lake Tuck Water System	80	0.12	80	0.12	54
Locloman Subdivision	150	0.22	150	0.22	34
Maple Vista	80	0.12	Unk.	Unk.	Unk.
Mint Grove	40	0.06	109	0.15	23
Mobile Home Wonderland	100	0.14	100	0.14	46
Mount Si Mobile Home Est.	300	0.43	Unk.	Unk.	Unk.
Mt. View Water Dist.	60	0.09	Unk.	Unk.	Unk.
North Bend Mobile Home Pk.	40	0.06	Unk.	Unk.	Unk.
Orchard Grove	48	0.07	45	0.06	20
Panther Lake North	35	0.05	Cl.(9)	Cl.	Cl.
Rakwanna Park Water System	39	0.06	Unk.	Unk.	Unk.
Reed Ranch Road Water			Cl.(9)	Cl.	Cl.
Sammamish View Park	20	0.03	40	0.06	25
Skyline, Duval	40	0.06	Unk.	Unk.	Unk.
Spring Glen Assn.	470	0.68	320	0.46	72
Spring Glen Mobile	60	0.09	Unk.	Unk.	Unk.
Spring Hill Development Co.	43	0.06	Unk.	Unk.	Unk.
Stone Creek Estates	60	0.09	Unk.	Unk.	Unk.

TABLE VIII-3 continued

	In-Service Capacity (2)		Water Right		
	GPM	MGD	Inst.	MGD	AF/YR
Class 2 continued					
Strandvik	45	0.06	Unk.	Unk.	Unk.
Tiger Mountain Tracts	40	0.06	Unk.	Unk.	Unk.
Tokul Creek Community	100	0.14	Cl.(9)	Cl.	Cl.
Trails End	110	0.16	120	0.17	24
Twenty-Three 800 Tiger Mountain Road	48	0.07	40	0.06	27
Twin Cedars	30	0.04	Unk.	Unk.	Unk.
Upper Preston Water Assn.	51	0.07	Unk.	Unk.	Unk.
Valley View Trailer Park	20	0.03	Unk.	Unk.	Unk.
Weber Point	45	0.06	Cl.(9)	Cl.	Cl.
Weona Beach	30	0.04	Unk.	Unk.	Unk.
TOTAL	4,079	5.91	2,865	4.12	1,058

54

Footnotes:

(1) Class 1 systems have more than 100 services. Class 2 systems have between 9 and 100 services.
(2) In-service capacity represents water systems that are equipped and on-line. The figures reflect the reported maximum amount of water that can be taken from the water source on an instantaneous basis by the installed pumping systems. It does not equate to source yield, nor does it indicate how long the systems are or can be operated at the maximum rate.
(3) Utility purchases all water from the Seattle Water Department (SWD).
(4) Utility purchases some of its water from SWD.
(5) Kirkland purchases all water from Rose Hill Water and Sewer District.
(6) Union Hill Water Association, Inc. purchases some of its water from the City of Redmond.
(7) Wilderness Rim purchases all water from Sallal Water Association.
(8) "Unk." means that no water right or claim to water right was found to match the utility's use.
(9) "Cl." means that a claim to water right that appears to match the utility's use of water has been identified in the "Water Right Claims Registry" of the Department of Ecology.
(10) KCWD No. 17 purchases all water.
(11) KCWD No. 117 purchases some of its water from Bellevue.

SECTION IX

SECTION IX

REGIONAL WATER SUPPLY PLAN

1. INTRODUCTION

Public water supply needs of the East King County study area are currently met by the City of Seattle municipal water system and by individual utility's development of wells and springs. Wholesale water service for Seattle satisfies approximately 70 percent of the total needs.

Increased future demands are significant if the water utilities are to serve the population growth anticipated and defined by the King County Comprehensive Plan and projected by the Puget Sound Council of Governments (PSCOG). The present Seattle Water Department (SWD) supply, including well fields at Highland and in the Tolt River watershed, is expected to meet the needs of the wholesale customers to the year 1997. An additional source(s) of supply must come on-line by 1997 if the region is to avert a water supply crisis.

Even though adequate supply may be available for the next several years on a regional basis, more immediate problems exist due to deficiencies in major water transmission facilities. Areas of immediate need are the service areas of the City of Redmond and the Sammamish Plateau Water and Sewer District. Critical water supply problems could exist in these areas as early as 1992.

For areas in the easterly portion of the study area which depend entirely on local groundwater supplies, there is concern as to the adequacy of future supply, both quantity and quality. Groundwater management programs as are currently being developed for the Issaquah Valley and Redmond-Bear Creek areas. The groundwater protection program developed by Renton may be required in other areas.

Planning to meet future growth in East King County has not been neglected by the water utilities. On a regional basis, the SWD has addressed future requirements through 5-year updates to is Water Comprehensive Plan. Eastside interests, led by the City of Bellevue, formed a consortium several years ago to conduct independent studies of future source alternatives and of institutional arrangements for regional water supply development, transmission, and delivery. The efforts of the consortium (Eastside Water Supply Venture) led to formation of the East King County Regional Water Association (EKRWA), which then joined with King County to initiate development of this Coordinated Water System Plan (CWSP).

Water conservation has been recognized as a cornerstone of any regional water strategy. Development of a progressive, yet realistic, water conservation program was the first step in considering new sources of supply.

This Section of the CWSP describes the policies developed to guide the evaluation of future source options, the process used for consideration of environmental, economic, and other factors related to each option, alternative development strategies, and the recommended Supply Plan.

2. PLANNING CRITERIA

A. Regional Water Supply Requirements

The previous subsections focus on demand forecasts for the East King County study area and the ability of utilities to meet these needs with existing supplies. Shortages are forecast to generally occur by the year 2000.

Using econometric modelling techniques and PSCOG population forecasts, an increase over current use of about 100 MGD is required on an annual average basis through the year 2040. An analysis of the larger Class 1 utilities ability to meet future demands through existing supplies (see Table VIII-2) produced a deficit of 92 MGD. Reduction in per capita water use through implementation of the water conservation program outlined in Exhibit VII-5 was factored into both of these analyses.

Based upon the above, a regional deficit of 100 MGD, on an annual average basis, was assumed to exist over the study period. This quantity was used for water supply investigation purposes.

B. Source Selection

Responsibility for identifying, examining, and recommending alternative sources for future water supply was assigned to the Supply Studies Subcommittee (Subcommittee) of the Water Utility Coordinating Committee (WUCC). Through a series of 20 meetings held generally on a monthly basis, the Subcommittee conducted an extensive and careful review of available sources.

Early in the study process, the Subcommittee identified criteria to be used in selecting/screening sources for study purposes. These criteria are:

(1) Water Quantity

- o Sufficient supply should be available to meet needs through the year 2040.
- o Source(s) must be developable from technical and political standpoints.
- o Look generally in the four-County area of Pierce, King, Snohomish, and Skagit Counties; examine principal streams from, and including, the Nisqually River to the Skagit River.
- o Consider conjunctive use.

(2) Water Quality

- o Source(s) must be of acceptable water quality.
- o Reuse of wastewater should be considered.
- o Existing quality must be protected.

(3) Efficiency

- o Make full use of existing systems.
- o Enhance development of existing sources.

(4) Reliability

- o Give priority to development of peaking supply (to meet summer demand) for immediate future.
- o Consider source augmentation (artificial recharge, storm water management, etc.)

(5) Environmentally acceptable.

(6) Politically acceptable.

In addition to the above, more specific criteria were developed for a comparative evaluation of alternative projects. These criteria are described in subsection 4.C., Comparative Evaluation of Individual Sources.

3. SCREENING OF SOURCES

A. Primary Streams

Using the criteria described above, and recognizing that significant sources of new supply will be required, the Subcommittee conducted an overview evaluation of water availability from the major surface water sources. Key constraints were assumed to be:

(1) Stream Closures - Water was assumed not to be available from those sources closed by the Department of Ecology (Ecology) to new water right applications.

(2) Instream Flow Limitations - A firm/continuous supply may not be available from sources where instream flows have been established by Ecology. Typically, the instream flow rights reduce availability most dramatically during the summer months--the period of peak requirements for municipal use.

(3) Water Quality Considerations - The degree of treatment required is a significant cost factor.

(4) Storage Dam Requirement - A major storage component is normally required on sources subject to instream flow limitations. Dam construction and operation is environmentally sensitive.

(5) Protected Area Program of Northwest Power Planning Council - Under this program, no new hydroelectric development should be allowed on streams designated by the Council as "protected areas." Multiple use projects dependent upon a hydroelectric component may not be viable.

The results of this overview evaluation are shown on Exhibit IX-1. As will be noted, major constraints exist on all sources. Instream flows are currently not established on the Stillaguamish and Skagit Rivers. However, it may be expected that such regulations would be adopted by Ecology before a water right application for a significant diversion of water would be approved.

The general effect of instream flow regulations upon future water availability was analyzed by the Subcommittee. Exceedence probability records were obtained from the U.S. Geological Survey (USGS). These records indicate the percentage of time the stream flow at a particular gaging station will equal or exceed a given rate of flow. Regulations adopted by Ecology establishing instream flows were also obtained. These regulations set forth flows, in the form of a hydrograph, wherein

the established flow must be exceeded before new water rights may be exercised. These two data sets were then combined for each of the sources listed in Exhibit IX-1. An example of the result is shown below for the Snoqualmie River at the USGS gaging station located near Carnation.

%	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.
0.99	443.3	582.7	1908.2	1188.5	1599.4	2185.8	2120.5	2819.0	1576.2	677.2	394.8	389.7
0.95	792.0	1260.3	2619.4	1919.0	2095.0	2375.9	2715.6	3402.9	2207.7	937.4	506.5	515.4
0.90	1050.0	1794.5	3085.9	2423.6	2418.9	2520.8	3058.8	3746.3	2615.5	1118.2	583.2	606.5
0.80	1441.2	2613.8	3746.3	3152.2	2878.8	2751.1	3492.1	4192.5	3182.1	1388.4	697.0	748.4
0.50	2455.7	4624.8	5354.6	4915.3	4015.1	3432.4	4348.7	5139.7	4505.2	2119.2	1004.5	1166.6
0.20	3821.7	6861.0	7518.7	7125.4	5598.0	4637.7	5192.6	6207.9	6159.7	3272.3	1495.7	1925.3
0.10	4655.6	7936.1	8916.1	8419.0	6659.2	5619.2	5609.3	6812.4	7157.3	4125.9	1866.4	2561.1
0.04	5610.2	8916.4	10638.1	9865.0	8012.6	7089.4	6024.7	7490.1	8317.7	5301.7	2388.0	3536.4
0.02	6249.9	9438.8	11890.2	10818.2	9029.4	8368.0	6273.9	7944.9	9117.4	6246.1	2816.2	4400.6
0.01	6832.6	9831.2	13117.1	11677.9	10053.3	9819.1	6483.9	8364.8	9868.2	7248.0	3279.3	5394.4

Monthly and annual mean discharge exceedence probabilities based on Log-Pearson III analysis (years 1929-1979)

The tabulated numbers by month are the USGS exceedence values in cubic feet per second. The solid line running laterally across the tabulation approximates the instream flow setting. Water is available for new appropriations only above the instream flow line. For example, in November (on a monthly average basis), water is available for new uses approximately 80 percent of the time. The shape of this data comparison is generally the same for all sources where instream flows are established. This results in a supplemental source being required (e.g., storage or groundwater) to serve needs when direct diversion is not allowed.

From this evaluation, and in consideration of the basic planning criteria, the Subcommittee selected the following streams for further investigation:

- Cedar River
- North Fork Snoqualmie River
- North Fork Tolt River
- Skagit River
- Snoqualmie River
- Sultan River

B. Secondary Sources

An overview evaluation was also conducted on a number of other sources identified by the Subcommittee where the individual yield may be relatively small. The sources considered with a brief statement of the development concept are as follows:

- Reuse of Treated Wastewater - Discharge appropriately treated municipal wastewater to Lake Washington to partially offset demands on the Cedar River for lockage requirements at the Chittenden Locks. Increased diversion at Landsburg on the Cedar River would be equivalent to the wastewater offset.

- Storage at Walsh Lake - Walsh Lake is located in the Cedar River watershed near Landsburg. Its outlet channel joins the Cedar River below the Landsburg Dam. Construction of a 40-foot high dam across the Walsh Lake outlet stream would create a lake containing about 14,000 acre-feet of active storage. By storing run-off waters for release to the Cedar River immediately below Landsburg during low flow periods, an equivalent increase in diversion of Cedar River water could take place at Landsburg.

- Cedar River Well Field - Develop a well field in the vicinity of Landsburg and pump groundwater directly to the SWD Cedar River system.

- Storage at Lake Sammamish - Regulate the discharge from Lake Sammamish by construction of a control structure at the outlet. Winter lake levels would be retained into the summer months for release to the Lake Washington system to offset Cedar River requirements for lockage water at the Chittenden Locks. An equivalent increase in Cedar River water would take place at Landsburg.

- Lake Washington Treatment Plant - Pump directly from Lake Washington through a filtration plant to the existing SWD system.

- Acquire Unused Major Industrial Sources - Acquire water rights from industrial users who have terminated use. Transfer/change rights to public water supply.

- Puget Sound Seawater - Construct desalination plant to process Puget Sound seawater for municipal water supply.

Preliminary evaluation papers were prepared for each of the above supply options. These papers appear in Appendix J. Subcommittee review and discussion of these options resulted in the recommendations contained in Exhibit IX-2. As will be noted, only the Walsh Lake storage option was carried forward.

It should also be noted that the Subcommittee determined that three of the secondary options evaluated, warrant further study. These are: (1) reuse of treated wastewater, (2) Lake Sammamish storage, and (3) Lake Washington treatment plant. In cases 1 and 2, the viability of the options hinge on whether developed water (increase in low flow to Lake Washington system) can be exchanged for increased use of the Cedar River at Landsburg. The answer to this question is highly dependent upon the results of Cedar River instream flow studies now in progress by the SWD. Since these studies will not be completed during the term of the CWSP preparation, follow-up studies must be conducted in a different forum. In cases 1, 2, and 3, improved water use efficiency at the Chittenden/Ballard Locks could "free up" water for other use.

Given the inter-relationship of these three cases, consideration should be given to a joint federal/state/local study of the Lake Washington drainage basin to evaluate options for improved efficiency of water use.

C. Groundwater Supply Assessment

At the initiation of the CWSP study process, it was recognized by the WUCC and Subcommittee that groundwater must be examined as a potential regional source of supply. It was intended that this examination be accomplished through coordination with two Ground Water Management Area programs authorized by Ecology for portions of the study area; and, that the balance of the area be included in a third Ground Water Management Area study effort. Data from the two ongoing management plans (Issaquah Valley and Redmond-Bear Creek Valley) were not available in time for use in this Plan. The third groundwater management plan for the balance of the area was not authorized prior to the preparation of this Plan. For these reasons, the consulting firms of Pacific Groundwater Group and Carr/Associates were retained late in the study process to conduct a general assessment of the availability of groundwater within the entire study area. These firms were selected based upon their professional qualifications and their extensive working experience in the study area. Their report titled, "East King County Regional Water Study - Groundwater Supply Assessment" appears in Appendix K.

(1) Technical Criteria

Technical criteria were developed and adopted by the Subcommittee to guide the work of the consultants in identifying aquifers of regional supply significance. These criteria are:

(a) Quantity

- o The aquifer shall be capable of yielding:
  - A minimum of 1.0 MGD (approximately 700 gpm) from a single, properly constructed well;
  - A minimum of 5.0 MGD over a 90-day period without producing long-term (greater than 1 year) static water level declines;
  - The above quantities, after allowance is made for actual uses authorized by State law and/or by State issued water rights.
- o Aquifer yield shall be determined taking into full consideration:
  - The potential for artificial recharge; and
  - The conjunctive/complementary use of surface and groundwater on an annual basis.
- o Withdrawal of groundwater shall not cause adverse effects on established instream flows or lake levels.

(b) Quality

- o Treatment of groundwater to meet DSHS' drinking water standards is a viable option.
- o Rejection of an aquifer as a regional supply source because of water quality considerations is primarily an economic decision.

(2) Assessment Objectives

Based upon the technical criteria stated above, the following objectives of the groundwater supply assessment were defined:

- o Identify areas which may be capable of meeting regional water supply needs;
- o Evaluate the potential well and aquifer yield of the groundwater supply areas;
- o Identify possible constraints on increased groundwater development including limitations on natural recharge and impacts to surface water features such as streams, wetlands, and lakes;
- o Assess the general vulnerability of the aquifer to land use impacts;
- o Identify the general feasibility of using artificial recharge technology within the water supply areas;
- o Identify possible water quality treatment concerns regarding iron and manganese; and,
- o Assess probable development costs.

(3) Assessment Methods and Approach

This assessment was cursory in nature and intended to provide an overall screening of the major groundwater supply areas within East King County. The approach to assessing the groundwater development potential of the East King County area was restricted to evaluating existing data from consultant reports, Ecology well logs, and Water Supply Bulletin No. 20 (Liesch, et.al., 1963).

Data for selected wells were tabulated and plotted onto a base map of the project area (Exhibit IX-3) in order to assess the general distribution of aquifer occurrence and productivity. Information such as well location, ownership, elevation, depth, depth of producing zone, static water level depth, specific capacity data, and potential as well as installed well yield was tabulated. Surficial geologic maps were used in conjunction with well information to identify the occurrence of shallow recessional outwash aquifers which tend to be relatively productive. Potential water supply areas were then identified based on the hydrogeologic data summarized within existing reports, the surficial geologic maps, and well information.

The water supply areas were divided into two categories (regional and subregional) depending upon their groundwater development potential. The regional water supply areas include aquifer systems where individual well yields would exceed 700 gpm (1.0 MGD) and the total sustainable yield would be in excess of 5.0 MGD. The subregional water supply areas include aquifer systems where individual well yields would range between 300 and 700 gpm and the total sustainable yield of the system would be less than 5.0 MGD. The regional aquifer systems would in general be capable of meeting regional water supply needs whereas the subregional aquifer systems would be of importance to providing local water supply needs.

A total of 14 water supply aquifer areas were identified within East King County including seven regional systems and seven subregional systems. Many other aquifer systems likely occur within the planning area and will be identified as additional exploration and testing takes place.

Because much of East King County is undeveloped, there are large areas where very few wells have been drilled and tested. It is likely that one or more unexplored areas could be capable of providing significant regional water supplies to the area. The water supply potential of many areas such as the Tolt Delta, Fall City, and other areas that lie east of North Bend appear to be quite promising. However, exploratory drilling and testing will be required to more fully quantify their development potential.

(4) Regional Water Supply Areas

The most productive aquifers in East King County occur within highly permeable sand and gravel outwash deposits. These aquifers are relatively shallow and typically occur in proximity to surface water features such as streams, lakes, and wetlands. Their productivity is due in part to the abundant recharge which occurs from both surrounding uplands as well as from induced recharge from the surface water system. Extensive development of these aquifers could result in some adverse impact to surface water features. In addition, some of these aquifer systems are susceptible to land use impacts given the high permeability of the overlying soils and the limited depth to water. Expanded use of these systems will require that appropriate management strategies be employed to assure that the quantity and quality of the resource is protected.

The deeper aquifer systems are generally less productive than the shallow systems. In addition, these systems are generally more difficult to characterize given the lack of deep subsurface information. Overlying low permeability zones typically limit the amount of recharge to the deeper aquifer systems. In addition, the low permeability zones tend to restrict the downward migration of contaminants. The deeper systems are generally less coupled to surface water features. Thus, groundwater development from these zones will result in less overall impact to the hydrologic system.

As is previously noted, seven aquifer systems were identified as meriting consideration as sources of regional supply. These systems are described in the report contained in Appendix K and are shown/mapped on Exhibit IX-3. No consideration was given to the extent of current use in identifying these aquifers.

A comparative evaluation was then made of the development characteristics of each of the seven areas using criteria established by the consultants. A description of these criteria and a matrix of the evaluation are shown on Exhibits IX-4 and IX-5, respectively.

Using the results of the matrix evaluation, only the Issaquah aquifer systems was selected by the Subcommittee for further evaluation. Three aquifer systems (Renton, Redmond, and Fall City) did not meet the 5 MGD criterion when current use (as measured by water right records of Ecology) was subtracted from aquifer yield. Of the remainder which do meet the 5 MGD or more available for development criterion, Cedar Falls was rejected due to the direct response of the aquifer to the Cedar River, the Tolt Delta is remote from the current or near-term regional transmission network, and the Upper Tolt River aquifer is currently being studied for development by the SWD and its use is being considered as part of the current supply system.

(5) Subregional Water Supply Areas

During the course of this work, the Consultants identified a number of aquifer systems within the study area with significant supply potential but less than 5 MGD. These were termed subregional water supply areas. These systems, which are also shown on Exhibit IX-3, could represent important sources of water for development to meet local supply needs.

Subregional supply systems have been identified within the Sammamish Plateau, Snoqualmie Flats, Kirkland, Mirrormont, North Redmond, Evans Creek, and Snoqualmie Falls areas. Other subregional systems will likely occur within many other areas of East King County. The occurrence and characteristics of these systems will likely be delineated in more detail as additional deep exploratory drilling and testing occurs.

A matrix evaluation was completed of these aquifer systems using essentially the same criteria as was applied to the regional water supply areas. One significant difference is that no attempt was made to determine current use of an aquifer and thereby remaining available for development. Results of the matrix evaluation are shown in Exhibit IX-6.

(6) Areas of Unknown Potential

Many other significant groundwater supply systems likely occur within the East King County area. Relatively little hydrogeologic data is available outside the major existing supply areas.

The unconsolidated deposits within the project area locally extend to depths of approximately 1,000 to 1,500 (Hall and Othberg, 1974). To-date, only a small portion of these deposits have been explored. Deeper exploration will help identify the possible existence of aquifers that may be of regional or subregional significance.

Three promising water supply areas that were identified during the course of this investigation are shown on Exhibit IX-3 (see "Aquifer Systems with Unknown Water Supply Potential"). The first area lies upstream of North Bend on the North Fork of the Snoqualmie River. The second area lies upstream of North Bend on the South Fork of the Snoqualmie River. Permeable outwash and alluvial deposits occur within both areas. The hydrogeologic setting for both of these areas are similar to that found within Renton, Issaquah, and other highly productive areas. The third area lies immediately south of Mirrormont in Section 36, Township 23N, Range 6E.

4. INDIVIDUAL PROJECT EVALUATION

A. Projects Examined

The water supply investigation resulted in eight sources being selected by the Subcommittee for further evaluation. Alternative development

options exist for several sources, providing a total of eleven supply projects. These projects are briefly described below. Yield is estimated in annual average MGD.

(1) Cedar River No. 1

Use of the waters of Chester Morse Lake would be enhanced by installing a pumping plant to withdraw waters stored below the current outflow elevation of the Lake. Chester Morse Lake is located in the upper Cedar River watershed and is currently developed for water supply by the SWD by construction of a control dam on the Lake outlet stream. Drafting of stored water takes place only down to the elevation of the natural lake (elevation 1,532). By pumping from the Lake, additional supply (the dead storage) could be obtained between elevations 1,532 and 1,500. An additional supply of 25 MGD would be obtained.

(2) Cedar River No. 2

Under this option, an earthen dam approximately 58 feet high (crest elevation 1,590) would be constructed at the outlet of Chester Morse Lake immediately upstream of the existing control structure. Storage of winter runoff and other surplus water would create a reservoir of 109,000 acre-feet. Stored waters would be released through a hydroelectric plant at the base of the dam to flow down the Cedar River to Landsburg for municipal supply use. The enhanced supply would be approximately 65 MGD.

(3) Walsh Lake

This natural Lake is located in the westerly/lower portion of the Cedar River watershed. Construction of an earthen dam approximately 40 feet high across the outlet stream would impound about 14,000 acre-feet of water. Stored water would be released to the outlet stream during the summer months and, at a point near Landsburg, be conveyed by pipeline to the Cedar River immediately below the Landsburg Dam. Diversion of Cedar River water at Landsburg would take place equivalent to the amount of Walsh Lake water discharged to the River. The enhanced supply of Cedar River water would approximate 30 MGD.

(4) North Fork Tolt River

An 8-foot high diversion structure would be constructed on the North Fork Tolt River at river mile 5.9. A pipeline would carry water from this point to the existing South Fork Tolt River regulating basin. A water filtration plant would be constructed in the vicinity of the regulating basin for treatment of both North and South Fork waters. A new water transmission line (Tolt Pipeline No. 2) would be required. Filtration of South Fork water will allow increased drawdown of the existing South Fork Tolt reservoir. Additional supply produced will be 47 MGD from the North Fork and 10 MGD from the South Fork.

(5) Main Stem Snoqualmie

A pumping plant would be constructed on the Snoqualmie River near the Town of Duvall and adjacent to the existing Tolt River pipeline crossing of the Snoqualmie River. The water transmission line would follow the existing Tolt pipeline right-of-way and discharge to the South Fork Tolt regulating basin. A water filtration plant would be required in the vicinity of the regulating basin for treatment of Snoqualmie and South Fork Tolt water. Additional drawdown of the South Fork Tolt reservoir would be possible with addition of the filtration plant. A total project yield of 18 MGD would result, consisting of 8 MGD from the Main Stem Snoqualmie River and 10 MGD from increased drawdown of the South Fork Tolt reservoir. The low yield of this option is due to instream flow regulations for the Snoqualmie River.

(6) North Fork Snoqualmie High Dam

This is one of two options for developing a combined hydropower and water supply project on the North Fork Snoqualmie River. A 200-foot high dam at river mile 6.7 would have one power generating station at the base of the dam and a second (Tokul) on the Snoqualmie River 0.8 miles downstream of Snoqualmie Falls. The penstock from the dam to the Tokul generating station would also serve as a transmission main for regional water supply. The penstock would be tapped at a distance above the Tokul powerhouse, water would flow to a filtration plant and then via a transmission line to the vicinity of Eastgate for connection with the regional supply network. This option would yield a firm supply of 90 MGD.

(7) North Fork Snoqualmie Run-of-River

This second option does not include a high dam. Instead, the diversion point would be moved upstream to river mile 8.6 where a low (16-foot) diversion facility would be constructed. The configuration of the water transmission system would be the same as the high dam option, but only one hydropower station (Tokul) would be constructed. Because of instream flow regulations, the South Fork Tolt reservoir must be used to achieve regional system reliability. A filtration plant would also be constructed in the Tolt basin to achieve greater drawdown of the South Fork Tolt reservoir. This option would yield a total new supply of 66 MGD, consisting of 56 MGD from the North Fork Snoqualmie and 10 MGD from the South Fork Tolt. (It should be noted that a third option was examined. This option did not include the companion use of South Fork Tolt storage. Yield of the North Fork Snoqualmie was reduced to 16 MGD. This option was rejected.)

(8) Skagit River

Two options were initially considered. The first was a gravity pipeline system from Baker Lake to connection to the SWD system near Woodinville. The second was a pumping plant located on the Skagit River near the Town of Sedro Woolley with pressure transmission lines to Woodinville. Water filtration was assumed in both cases. A design quantity of 200 MGD (average daily flow) was selected. This represents twice the demand for the East King County study area but it was assumed any pipeline originating from the Skagit River will serve an area greater than East King County.

The Baker Lake gravity system was dropped for technical and financial considerations. The effective difference between intake and discharge elevations is about 84 feet. A pipeline on the order of 11 feet in diameter would be required. Overall, this option is less cost effective than the pumping option at Sedro Woolley.

(9) Sultan River No. 1

Communications with the City of Everett and Snohomish County PUD indicated that a surplus of water to Snohomish County needs may exist in the Sultan River basin. This surplus would be available on a declining basis until the year 2020. At that time, it is

forecast that Everett will need the full capacity of the Sultan Project to serve the needs of Snohomish County. Certain conditions of availability were set forth, including payment for lost power revenues.

Two options for interim use of Sultan Project water were considered. The first provided for enlarging the Everett filtration plant located at Lake Chaplain to provide an additional 25 MGD average flow. A new pipeline would be constructed from the filtration plant in a southerly and westerly direction to the vicinity of the City of Snohomish. The pipeline would then follow the same southerly route used in the Skagit River analysis to connection with the Tolt River system in the vicinity of Woodinville. The entire system would be sized to deliver 25 MGD to the East King County area.

(10) Sultan River No. 2

This option is the same as Sultan River No. 1 except for sizing of the pipeline segment from the City of Snohomish to Woodinville. This segment would be designed to carry 200 MGD as a first phase of the Skagit River pumping plant project.

(11) Well Field Near Issaquah

This is the only groundwater option considered for regional supply based upon current information. Two development phases are proposed at 6 MGD each (three wells at 2 MGD per well). The total yield of 12 MGD would be pumped to the regional system. Development of phase 1 would follow completion of the Ground Water Management Plan (GWMP) now in progress for the Issaquah Valley area. Additional groundwater information and groundwater management policies which evolve from the GWMP may influence the viability of development of this source for regional supply.

B. Technical Evaluation

Having identified those source options to be further considered, the Subcommittee established a process and related criteria for considering the merits of individual projects. The process involved the following steps:

(1) Design considerations were adopted for uniform evaluation of all projects. These design criteria are contained in Appendix L.

(2) A unit approach was adopted for determining project costs. Unit values for pipeline and other basic project works are also contained in Appendix L.

(3) Project costs in March, 1989, values were determined for "source" and "transmission" facilities. For the Tolt River and Snoqualmie River options, source components were considered to be the diversion/withdrawal and water conveyance works from the supply source to and including the filtration plant. Transmission included the pipeline and pumping/booster station required to connect the filtration plant to the regional system. The boundary point between source and transmission was Lake Youngs for Cedar River projects and the junction (near Woodinville) with the Tolt Eastside Supply Line for the Skagit and Sultan River projects. The transmission works were determined by CH2M-Hill through development and use of a computer model of the SWD supply system.

(4) Project Summary papers were prepared for each project option. These papers are contained in Appendix M. Each project is described as to development concept, source and transmission components and cost, yield in MGD, regional benefits, water right issues, water quality considerations, source efficiency and reliability, environmental considerations, and implementability.

(5) Present value was calculated for each project taking into consideration the phasing of project elements; capital, operating, and maintenance costs; and power revenues. The assumptions used in making the present value determination are shown in Exhibit IX-7 and the results thereof are contained in Exhibit IX-8.

C. Comparative Evaluation of Individual Sources

As a final step in the evaluation of the merits of individual projects, the Subcommittee developed a matrix which displays the majority of the information contained in the Project Summary papers. The matrix, as completed and adopted by the Subcommittee, is Exhibit IX-9.

This matrix is intended to display the significance of the evaluating criteria to each project. Since: (1) there is no weighting of criteria, (2) the degree to which the supply meets the year 2040 demand varies from minor to significant, and (3) project cost is shown but not included in the evaluation, this matrix does not result in a valid ranking of projects. The Subcommittee considered the matrix to be but one of several important factors to facilitate a screening process for selecting combinations and scheduling of projects to meet future needs.

5. SUPPLY SCENARIOS

A. Supply Objectives

The examination of the supply options described above was primarily singular to considering the availability of water from a particular source and the associated economic, environmental, political, and regulatory constraints to development. Most of the sources examined meet only a portion of the long-range demand forecast for the region. This examination was characterized as looking at "stand alone" projects.

The next step in the study process was for the Subcommittee to join projects in several combinations (or scenarios) for further examination. For guidance in this effort, the following objectives were adopted:

(1) To select scenarios that equal or exceed the year 2040 regional water demand.

(2) One source option must be implementable by the year 1997 and the others within the schedule dictated by the demand forecast.

(3) Priority should be given to development of new sources which are a logical extension of the existing transmission grid.

(4) The component projects of a scenario should be a mix that reduces environmental impacts to the greatest degree possible.

(5) Inter-regional requirements should receive primary consideration but the long-term needs of adjacent areas should also be considered.

B. Supply Scenarios Examined

Guided by the above objectives, five supply scenarios were selected for comparison. Two of the "stand alone" sources were dropped from further consideration. These were:

- Main Stem Snoqualmie River - The low yield resulting from the instream flow requirements for the River, established by Ecology regulations, severely impacts the overall feasibility of this option.

- Sultan River - The limitation that water is only available on a declining basis (to zero) to the year 2020 relegates this option to a temporary source of supply. Also, the requirements by the City of Everett and the Snohomish County PUD that: (1) the cost of lost power must be recovered by the PUD, and (2) both Everett and

the PUD should be able to achieve a reasonable rate of return on their past investment in facilities benefitting King County customers, place a vaguely defined economic cloud on this option.

In developing the five scenarios, source development costs for each option/project were taken from the "stand alone" analysis. Transmission requirements (pipeline and pumping stations) were again determined by CH2M-Hill through use of the regional hydraulic model. Capital costs of each scenario were then determined. These costs were subjected to a present value determination on a scenario basis considering the phasing of projects dictated by the demand forecast. Assumptions used in the present value analysis are as identified in Exhibit IX-7.

A summary of the five scenarios/regional supply alternatives is as follows:

Summary of Regional Supply Alternatives
(1989 Dollars - Millions)

Scenario	Project Elements	Year On-Line	Yield (MGD)	Present Value Total	Present Value $/MGD
1	Issaquah Wellfield	1997	103	296.4	2.88
	N. Fork Snoqualmie River (run-of-river)	2004			
	Tolt River Filtration	2013			
	Cedar River No. 1	2035			
2	Issaquah Wellfield	1997	102	384.5	3.77
	N. Fork Snoqualmie River (high dam)	2004			
3	Issaquah Wellfield	1997	94	198.8	2.11
	Tolt River Filtration	2004			
	N. Fork Tolt River	2010			
	Cedar River No. 1	2030			
4	Issaquah Wellfield	1997	107	275.1	2.57
	Cedar River No. 2	2004			
	Walsh Lake	2034			

Scenario	Project Elements	Year On-Line	Yield (MGD)	Present Value Total	Present Value $/MGD
5	Issaquah Wellfield	1997	94	320.3	3.41
	Tolt River Filtration	1997			
	N. Fork Tolt River	2010			
	Skagit River (Phase 1)	2030			

Detailed information regarding each scenario is contained in Exhibits IX-10 through IX-14. This information includes three parts for each scenario as follows:

(1) A location map of sources and transmission facilities,

(2) A tabulation of the project elements and associates costs, and

(3) A graphical display of the manner in which each scenario meets the regional demand forecast.

It should be noted that phases 1, 2, and 3 of the Tolt Pipeline No. 2 project (from the Snoqualmie River west to connection with the Tolt Eastside Supply Line) are assumed to be completed by 1997 and this segment of the pipeline is shown as an existing facility. In addition, Exhibit IX-15 provides a tabulated comparison of the source, transmission, and combined costs of each scenario in present value terms.

6. RECOMMENDED SUPPLY PLAN

A. Objectives

The relative merits of the five scenarios were thoroughly evaluated by the WUCC. A special joint meeting of the Steering Committee and Supply Studies Subcommittee was held to develop recommendations as to a preferred scenario or a "Supply Plan." In developing these recommendations, the following objectives were emphasized:

(1) The Supply Plan must be implementable within the schedule defined by the demand forecast.

(2) The Supply Plan should minimize environmental impacts to the degree possible, with specific consideration to optimizing existing developments before developing new watersheds.

(3) The Supply Plan should give a clear message to the SWD on what the Eastside purveyors believe is the best next major supply of water for meeting the Eastside's projected need and include a commitment to work with the SWD in refining the Plan through further study.

(4) The Supply Plan should recognize the need for use of groundwater on a regional, sub-regional, and local basis and of the requirement for associated additional studies and investigations.

(5) The Supply Plan should recognize that 100 MGD may not be adequate to meet the long-term needs or additional demand from adjacent study areas.

(6) The WUCC recognizes that during a 50-year planning horizon, many changes in current practices will occur. Consequently, the decisions based on projections beyond a 25-year horizon should be subject to periodic review and possible modification.

B. Findings

In applying the above objectives to the supply scenarios under consideration, the following findings were adopted:

(1) The Scenarios that incorporate the North Fork Snoqualmie supply will require a new dam (high or low) in an area not yet developed and, therefore, may have a greater environmental impact than expansion of the Tolt or Cedar River supply system.

(2) The Scenarios that incorporate the Tolt and Cedar River expansion are more flexible in terms of phasing in new or expanding existing facilities.

(3) Scenario Nos. 3 an 5 provide lead time flexibility to further study the long-term options for the Eastside and to incorporate the Puget Sound Urbanizing Area (Skagit to Thurston County and Kitsap County) in the consideration of the second major surface supply source (i.e., Skagit River, North Fork Snoqualmie River, and Cedar River).

(4) The CWSP and associated Supply Plan will be reviewed and updated, as required, on a 5-year schedule. This will enable the EKRWA to further consider the Skagit River and North Fork Snoqualmie River as new supply. The schedule will also enable the EKRWA to join with Seattle, Tacoma, and Everett, in continuing to optimize the use of existing supplies.

(5) Groundwater availability in the CWSP study area is very limited, based on a review of existing hydrogeologic data, investigations by two qualified hydrogeologists, and a preliminary review by USGS. Two potential, but limited, aquifer systems were located in the urbanizing area (Issaquah and Tolt Delta) and several potential but limited systems were located in the rural areas.

(6) Identification and integration of other instream and out-of-stream use plans by the State Tribes and other users need to continue to be pursued by the Washington Water Utility Council.

C. Recommended Plan

Based upon these findings, the Steering Committee recommended to the WUCC that the Supply Plan described below be the preferred supply option for the East King County CWSP. This recommendation was adopted by the WUCC. In doing so, the WUCC recognized that the SWD is currently updating its Comprehensive Water System Plan and further recommended that the EKRWA work in concert with SWD to refine the Supply Plan and associated management program to achieve an effective partnership between SWD and EKRWA.

The recommended Supply Plan has the following components:

(1) To provide adequate supply for the projected demands of the East King County CWSP, the EKRWA should develop a program with the SWD that will achieve the following:

(a) Prior to 1997 - Develop Issaquah well field as a regional source of water.

(b) Prior to 1997 - Construct a filtration plant for the South Fork of the Tolt to develop additional supply from the existing reservoir.

(c) Prior to 2010 - Develop North Fork Tolt system with water filtration.

(d) Prior to 2030 - In cooperation with Puget Sound area utilities, local governments, tribes, and others, further study the development of the North Fork Snoqualmie, Skagit, and Cedar Rivers projects to identify the preferred method of meeting the Puget Sound area's municipal and industrial water supply needs.

(2) To provide additional regional supply needs and to minimize the need to develop new impoundments in undeveloped watersheds, the EKRWA should:

(a) Support the SWD negotiations and plans to fully develop the Cedar River Watershed as a major component of the Puget Sound Regional Supply System. Planning activities should include a joint federal, state, and local study of the Lake Washington drainage basin to evaluate options for improved efficiency of water use at the Chittenden Locks, regulation of the outflow of Lake Sammamish, and other potential basin water improvement projects.

(b) Support projects that will maximize the use of surface and groundwater development in a conjunctive mode and utilize interbasin transfers to make full utilization of existing systems.

(3) Formally request the Department of Ecology to withdraw the North Fork Snoqualmie and the Skagit River from additional appropriations of 5.0 cfs/3.2 MGD or more in accordance with RCW 90.54.050(2) until July 1, 1994, or until the State reserves municipal water supply, in accordance with RCW 54.54.050(1), for the future municipal needs of the Puget Sound area, whichever occurs first. The intent of this withdrawal is to allow routine appropriations for relatively small amounts of water to continue to take place pursuant to State law, but to defer decisions on allocations of major blocks of water to particular users until sufficient information and data are available to determine regional needs and priorities.

(4) The EKRWA should pursue development of the Issaquah aquifer as an element of the Supply Plan, and should assist the water utilities in further evaluating the potential developable yields of the aquifers located in the rural area for use as subregional supplies. All data collected and developed should be inputted into the EKRWA/South King County Regional Water Association Data Management Center to assist in this objective. The benefit of an East King County Ground Water Management Plan should be evaluated by EKRWA in cooperation with the water purveyors.

7. PRE-1997 REQUIREMENTS

As is noted in this report, with addition of the Highline and Tolt wellfields, the existing Cedar and Tolt River sources are forecast to meet regional needs to the year 1997. However, the rate of population growth to the east of Lake

Sammamish is stressing water utilities which currently rely entirely on groundwater. Most severely impacted is the Sammamish Plateau Water and Sewer District. If this rate of growth continues into the next decade, water supply shortage will occur in certain areas prior to 1997 due to a lack of transmission facilities to serve the growth areas from the regional supply.

The Supply Studies Subcommittee examined this potential problem. The findings were:

A. The Sammamish Plateau Water and Sewer District groundwater supply (with increased pumping from Well Nos. 7 and 8) will satisfy existing commitments through the year 1991 (at a 20 percent growth rate) or 1995 (at a 10 percent growth rate).

B. Connection to the regional source through completion of Phase 1 of Tolt Pipeline No. 2 (TPL2) will meet the City of Redmond needs through the year 2000.

C. The Northeast Sammamish Sewer and Water District does not anticipate any water shortage within the next 5 years.

D. Large developer projects (Port Blakely and Quadrant) are proposed for 1992.

E. The SWD plans to construct TPL2 in phases. The portion west of the Snoqualmie River consists of the three phases shown in Exhibit IX-16. Current planning targets completion of Phase 1 by June 1, 1990 (to serve Redmond), Phase 2 is not scheduled, and Phase 3 is to be on line in 1994.

F. With replacement of approximately 4.2 miles of Tolt Pipeline No. 1 east of the Snoqualmie River with 81 inch diameter pipe by 1990, transmission capacity will exist for service to Phase 3 of TPL2.

Given the circumstances described above, the Subcommittee unanimously recommended the SWD advance its planning for Phase 3 of TPL2 by including in its capital improvement program the completion of this project by June, 1992.

EXHIBIT IX-1

PRIMARY STREAM EVALUATION

River (River Mile)	Ecology		Treatment Water	Storage Required	Protected Area
	Closure	Instream Flows			
Nisqually near McKenna (32.6)	Yes	Yes	Yes	Yes	Yes
Puyallup at Puyallup (6.6)	No	Yes	Yes	Yes	Yes
Puyallup at Alderton (12.2)	No	Yes	Yes	Yes	Yes
Green near Palmer (60.4)	No	Yes	Yes	Yes	Yes
Cedar at Renton (1.6)	No	Yes	Yes	Yes	Yes
Snohomish near Monroe (20.4)	No	Yes	Yes	Yes	Yes
Snoqualmie near Carnation (23.0)	No	Yes	Yes	Yes	Yes
N. Fork Snoqualmie near North Bend (2.2)	No	Yes	Yes	Yes	No (mouth to 8.8)
Tolt near Carnation (8.7)	No	Yes	Yes	Yes	Yes
N. Fork Stillaguamish near Arlington (6.5)	No	No	Yes	Not Known	Yes
Skagit near Concrete (54.1)	No	No	Yes	Not Known	Yes
Skagit near Mt. Vernon (15.7)	No	No	Yes	Not Known	Yes

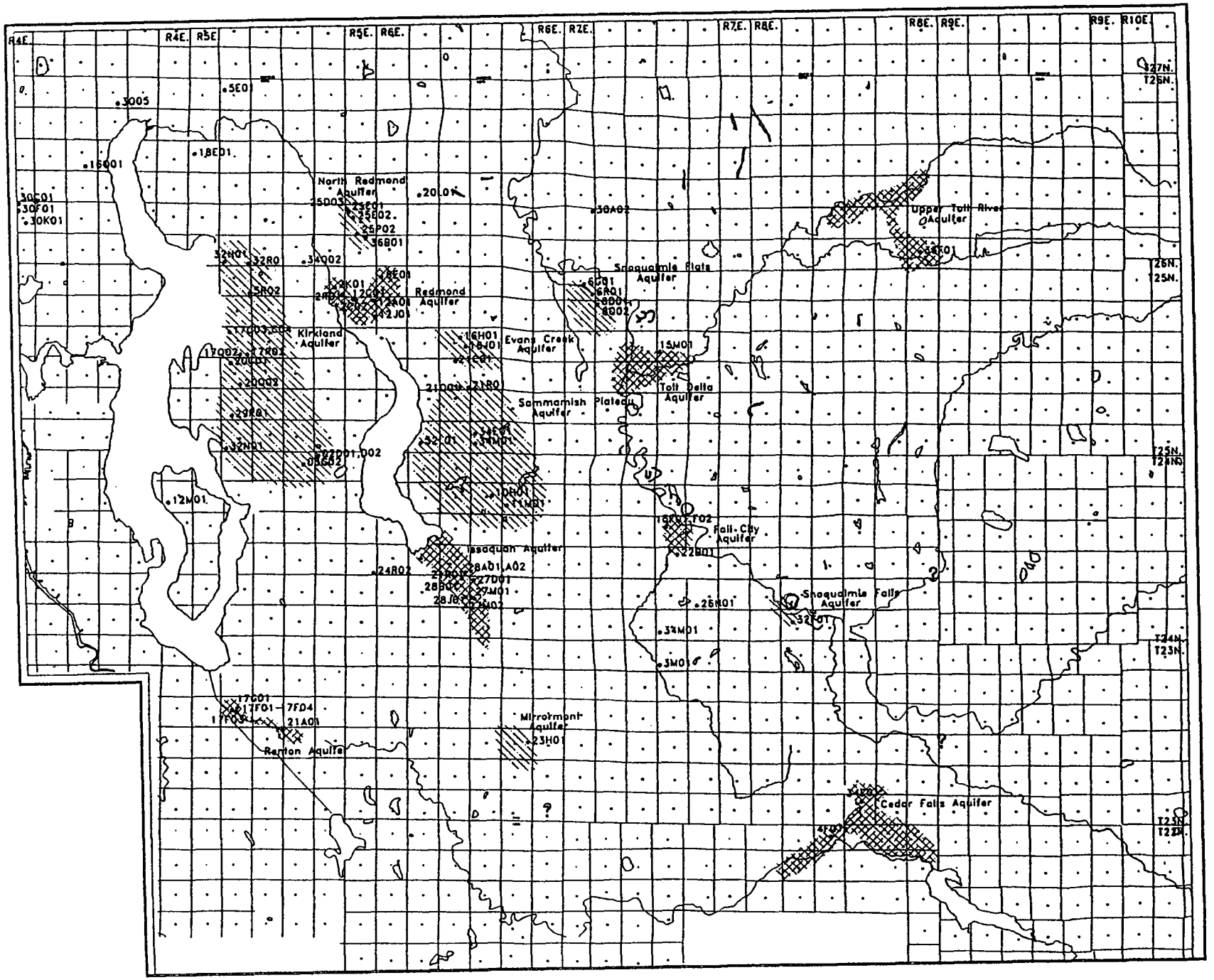
EXHIBIT IX-2

RECOMMENDATIONS ON SECONDARY SOURCE OPTIONS

Option	Comments	Action
1. Reuse of Treated Wastewater	o Viability of option tied to results of current SWD instream flow study of Cedar River. o Results of instream flow study are not timely to CWSP process. o Economics of option may be marginal.	Further study warranted upon completion of instream flow study.
2. Walsh Lake Storage	o Significant source for seasonal/ low flow use.	Include in CWSP study process.
3. Cedar River Well Field	o Marginal supply - significant hydraulic continuity with Cedar River. o Significant cost per unit of water.	No further study.
4. Lake Sammamish Storage	o Must determine potential impacts of higher summer lake level on recreational use and abutting property owners. o Potential for 1.5 to 1.8 feet storage on Lake. o Viability of exchange with Cedar River water tied to SWD instream flow study.	Further study warranted upon completion of instream flow study.
5. Lake Washington Treatment Plant	o Water use conflicts with operation of Chittenden Locks. o Determine potential for water savings/transfer to municipal use through modification of Locks design and/or operation. o Water savings of 33% could possibly be achieved by reducing leakage at Locks gates and flushing saltwater through Locks rather than drain.	Further study to determine opportunities and viability for improving water use efficiency of Chittenden/ Ballard Locks and assigning saved water to municipal use.

EXHIBIT IX-2 continued

Option	Comments	Action
6. Unused Major Industrial Sources	o Ecology water right records disclose few rights in study area where the industrial use is of significant amount (3 MGD or more). o Transfer of water rights from an industrial use (usually non-consumptive) to municipal use (consumptive) is normally not allowed. o Option has limited to no potential.	No further study.
7. Puget Sound Seawater	o Technology for desalinating seawater is advancing over time. o No plants larger than 3 MGD are operating in the United States. o Costs for processed water using reverse osmosis process runs approximately $4 to $6 per 1,000 gallons under near-optimum operating conditions.	No further study.



EAST KING COUNTY
COORDINATED WATER SYSTEM PLAN

EXHIBIT IX-3
WATER SUPPLY AREAS

AUGUST 1990

REGIONAL WATER SUPPLY SOURCE AQUIFER SYSTEM

SUBREGIONAL WATER SUPPLY SOURCE AQUIFER

? AQUIFER SYSTEM WITH UNKNOWN WATER SUPPLY POTENTIAL

● 17G01 LOCATION AND LOCAL NUMBER OF SELECTED DATABASE WELL

EXHIBIT IX-4

GROUNDWATER SUPPLY EVALUATION CRITERIA

The following elements were used to compare the various development characteristics of the groundwater areas having water supply potential:

- Aquifer Occurrence - This matrix element provides an estimate of the aquifer depth of occurrence below ground surface. An aquifer's depth has significance relative to its recharge characteristics, potential development impacts, aquifer vulnerability, and cost of development.

- Potential Well Yield - This matrix element provides an estimated range in well yield for properly designed and developed wells. The potential well yield was computed as the product of the specific capacity and 2/3 of the available drawdown. The estimates assume that drawdown would not exceed 100 feet.

- Aquifer Yield - This matrix element provides an estimate of the total yield of the aquifer. The yield estimates for some systems such as Renton, Redmond, Issaquah, and Cedar Falls are based in part on modeling investigations and historical monitoring of system performance under groundwater development. For other systems such as Tolt Delta, Fall City, and Upper Tolt River where limited data are available, the yield of the system was evaluated in terms of the yield characteristics of similar hydrogeologic environments. Continuous withdrawal and peaking withdrawal estimates were identified for the regional supply areas. The continuous estimates represent the potential rate of withdrawal that could be developed on a sustained basis without producing significant long-term water level declines. The peaking supply estimates represent the potential yield of the system over short-term high demand periods of 1 to 3 months.

- Existing Development - This matrix element provides an estimate of existing groundwater withdrawal from the water supply area. Groundwater withdrawal was estimated from a water use inventory of the major water purveyors. The water use estimates reflect average rates of groundwater withdrawal. Water usage was not tabulated for the subregional supply areas.

- Available Development - This matrix element provides an estimate of the amount of groundwater that is potentially available for development. The estimate generally represents the difference between the total continuous aquifer yield and existing development. In the case of Cedar Falls, the estimate represents the potential peaking yield of the aquifer.

- Recharge Characteristics - This matrix element provides a qualitative estimate of the overall recharge to the water supply area. Shallow aquifer systems that occur within valley discharge areas were considered to have a high recharge potential. Deep aquifer systems that occur beneath upland areas were considered to have low recharge potential. The productivity of the water supply areas will be a function of the areas recharge characteristics. Areas with high recharge will generally be able to sustain larger rates of development than areas with low recharge.

- Potential Development Impacts - This matrix element provides a qualitative measure of the degree to which groundwater development may impact surface water features. Groundwater development from shallow unconfined aquifer systems that lie in proximity to streams, lakes, and wetlands have a high potential for impact (some measurable reduction in stream flow may occur from development). Conversely, development from deep confined aquifer systems that occur at some distances from surface water features will have a lower potential for impact (no measurable reduction in streamflow will likely occur). Impacts are of primary concern in areas where there are instream flow requirements or stream closures. In most cases, groundwater development can be managed so as to minimize the level of impact to surface water features.

- Aquifer Vulnerability - This matrix element provides a qualitative measure of the aquifer systems susceptibility to land use impacts. Land use impacts include degradation of water quality and reduction in recharge associated with impervious surfaces. Shallow unconfined aquifers that lie in proximity to urbanized areas would be most vulnerable to land use impacts. Deep confined aquifers which have overlying low permeable units would generally have a low vulnerability.

- Artificial Recharge Potential - The matrix element provides a qualitative measure of the potential for augmenting aquifer yield through artificial recharge. The feasibility of artificially recharging aquifers is a function of many variables including availability of recharge water, water chemistry compatibility, and aquifer characteristics. To be suitable for recharge, an aquifer must be able to effectively transmit and store groundwater. Low permeability aquifers will not be able to efficiently transfer water away from recharge centers. Shallow water table aquifers that underlie urbanized areas would be generally ineffective in storing recharge water because of the potential for flooding structures. Aquifers that lie in proximity to discharge areas may not be suitable for recharge given their limited capacity to contain recharge water.

- Fe and Mn Quality - This matrix element provides a qualitative measure of anticipated aquifer water quality as it relates to iron and manganese. Iron and manganese concentrations within Puget Lowland aquifers tends to be highly variable and difficult to predict. The probability of encountering iron and

manganese concentrations was rated as "high" for areas where a large percentage of wells exceed State Drinking Water Standards (0.3 mg/l and 0.05mg/l for iron and manganese, respectively). A "low" rating was given to areas where most wells show concentrations less than the State standards. Areas having limited data or concentrations near the State standard were given a "moderate" probability. Elevated iron and manganese concentrations can in many cases be effectively treated through blending with higher quality sources or using oxidizing agents.

EXHIBIT IX-5
WATER SUPPLY EVALUATION MATRIX
EAST KING COUNTY (Regional Supply Source Areas)

WATER SUPPLY SOURCE AREAS	EVALUATION CRITERIA											
	Aquifer Occurrence (ft-bgs) (1)	Potential Well Yield (gpm) (2)	Aquifer Yield (mgd) Cont. (3)	Aquifer Yield (mgd) Peak (3)	Existing Development (mgd) (4)	Available Development (mgd) (5)	Recharge Character. (6)	Potent. Dev Impacts (7)	Aquifer Vulner. (8)	Artificial Recharge Potential (9)	Fe & Mn Quality Problems (10)	Remarks
Renton	40 - 100 100 - 300	> 2500 > 2000	8 - 10 3 - 5	10 - 15 > 5	9 0	0 - 1 3 - 5	High High	High Moderate	High Mod. - Low	Low Low	Low Mod. - High	Two subsystems; Shallow Renton aquifer and deep Maplewood aquifer. Instream flow impacts are major concern.
Cedar Falls	50 - 300	> 2500	0	10 - 15	0	10 - 15 (P)	High	High	Low	High	Low	Most all groundwater is from seepage losses from Masonry Pool. Development may adversely impact return flow.
Redmond	20 - 70	500 - > 2000	5	5 - 10	2	3	Moderate - High	Moderate - High	High	Low	Moderate	Aquifer is highly subsectible to contamination given is shallow nature and existing land use.
Issaquah	50 - 200 (shallow aquifers)	2000 - > 2500	15	15 - 25	3	12	High	Moderate ?	High	Low	Moderate	Two productive aquifers within shallow deltaic sands and and gravel deposits. A deeper aquifer may also be present.
Tolt Delta	0 - 200	> 1000	5 - 10	10 - 15	< 1	4 - 9	High	Moderate - High	Moderate	Low	Moderate	Very limited data. Hydrogeologic setting is similar to Renton and other recessional outwash aquifer systems
Fall City	50 - 200 550 - 600	1000 - 2000 > 1000	5	5 - 10	< 1	4	High Mod. - Low	Mod. - High Low	Mod. - High Low	Low Moderate	High Moderate	Two aquifers identified. Shallow recessional outwash aquifer and deep aquifer.
Upper Tolt River	200 - 400	> 2500	5	5 - 10	0	5	Mod. - Low	Mod. - Low	Low	Moderate	Low	Occurs near existing pipeline. Aquifer may be discontineous and have limited areal extent.

Footnotes:

(1) Approximate depth of aquifer in feet below ground surface.
(2) The estimated range in well yield for properly designed and developed wells.
(3) Estimated range in aquifer yield in million gallons per day. The estimated range in yield includes contineous and peaking supply for Regional Areas. The reader should refer to the text for clarification of these estimates.
(4) Estimated existing water useage in million gallons per day. Estimates are based on water use questionaire.
(5) The estimated groundwater available for development in million gallons per day. Reflects the difference between the estimated total yield (3) and current useage (4). Groundwater availability is based on contineous yield estimates unless otherwise noted (i.e. P for peaking).
(6) Qualitative estimate of aquifer recharge conditions (high, moderate, low).
(7) Qualitative estimate of the degree to which groundwater development may impact surface water features.
(8) Qualitative estimate of the aquifer system's susceptibility to groundwater contamination.
(9) Qualitative estimate of the potential for augumenting aquifer yield through artificial recharge.
(10) Qualitative estimate of the likelyhood of encountering problematic levels of iron and manganese.

EXHIBIT IX-6
WATER SUPPLY EVALUATION MATRIX
EAST KING COUNTY (Subregional Supply Source Areas)

Water Supply Source Area	EVALUATION CRITERIA											
	Aquifer Occurrence (ft-bgs) (1)	Potential Well Yield (gpm) (2)	Aquifer Yield (mgd) Cont. (3)	Aquifer Yield (mgd) Peak (3)	Existing Development (mgd) (4)	Available Development (mgd) (5)	Recharge Character. (6)	Potent. Dev Impacts (7)	Aquifer Vulner. (8)	Artificial Recharge Potential (9)	Fe & Mn Quality Problems (10)	Remarks
Sammamish Plateau	50 - 150 500 - 700	500 500	< 5	?	N/A	N/A	Mod. - High Low	Mod. - High Low	Mod. - High	Low Mod. - Low	?	A shallow water table aquifer overlies a deep confined system.
Snoqualmie Flats	100 - 200 550 - 700	300 - 500 500	< 5	?	N/A	N/A	Low Low	Low Low	Mod. - Low Low	Low ?	?	Shallow aquifer with limited areal extent and deep confined aquifer with unknown continuity.
Snoqualmie Falls	500 - 550	500 - 1000	< 5	?	N/A	N/A	Low	Low	Low	?	?	Limited data available. Deep confined aquifer which may have limited extent. Shallow aquifers may also occur locally.
Mirrormont	250 - 350	500	< 5	?	N/A	N/A	Low	Low	Moderate	Mod. - Low	?	Isolated aquifer with unknown continuity and extent.
North Redmond	50 - 150	300 - 500	< 5	?	N/A	N/A	Low	Low	Moderate - High	Low	?	Isolated aquifer with unknown continuity and extent.
Evans Creek	50 - 150	500 - 1000	< 5	?	N/A	N/A	Moderate	Moderate	Moderate	Mod. - Low	?	
Kirkland	100 - 200	500	< 5	?	N/A	N/A	Moderate	Moderate	Mod. - High	Mod. - Low	?	Aquifer occurs within older unnamed gravel unit.

Footnotes:

(1) Approximate depth of aquifer in feet below ground surface.
(2) The estimated range in well yield for properly designed and developed wells.
(3) Estimated range in aquifer yield in million gallons per day. The estimated range in yield includes contineous and peaking supply for Regional Areas. The reader should refer to the text for clarification of these estimates.
(4) Estimated existing water useage in million gallons per day. Estimates are based on water use questionaire.
(5) The estimated groundwater available for development in million gallons per day. Reflects the difference between the estimated total yield (3) and current useage (4). Groundwater availability is based on contineous yield estimates unless otherwise noted (i.e. P for peaking).
(6) Qualitative estimate of aquifer recharge conditions (high, moderate, low).
(7) Qualitative estimate of the degree to which groundwater development may impact surface water features.
(8) Qualitative estimate of the aquifer system's susceptibility to groundwater contamination.
(9) Qualitative estimate of the potential for augumenting aquifer yield through artificial recharge.
(10) Qualitative estimate of the likelyhood of encountering problematic levels of iron and manganese.

EXHIBIT IX-7

ASSUMPTIONS USED IN PRESENT VALUE DETERMINATION

Period of Analysis - 1997 to 2040

Inflation Rate - 5 percent

Real Discount Rate - 3 percent

Borrowing Interest Rate - 8.15 percent, Term 20 years

Present Value - Refers to the value in a base year of a future cost stream. All costs discounted to base year 1997 and presented in 1989 dollars.

Hydropower Revenue - There are three parts of hydropower revenue estimates: (1) annual output of the generation plant in megawatthours per year, (2) percent of output classified as "firm" power and percent classified as "nonfirm" power, and (3) value of firm and nonfirm power in cents/kwh. The first part, annual power generation, is a constant over the life of the project, and was determined by project design. The second part, percent of generation that is firm and nonfirm, is assumed to be 50 percent firm and 50 percent nonfirm for projects with storage (Cedar No. 2 and North Fork Snoqualmie High Dam) and 100 percent nonfirm for run-of-river projects (North Fork Snoqualmie). The third part, value of firm and nonfirm power, is a variable that increases over time. Both firm and nonfirm power values were based on Puget Sound Power and Lights' (PSPL) 1988 37-year forecast of avoided costs (Attachment 1).

Pumping Power Costs - Based on 4 cents/kwh (1989 $). Escalates at 1 percent real.

Capital, O&M Escalation - 0 percent real.

Equipment Replacement - Physical life 22 years. Replacement cost equals 20 percent of initial capital cost (including 80 percent contingencies) of component (pumping plant, treatment plant, generation plant).

Treatment Plant O&M - Based on regression of annual O&M costs versus average annual flow. Intercept equals fixed costs. Slope equals variable costs (Attachment 2).

Block Approach Cost Analysis - Assumes that full capacity of plant on-line is utilized. Variable unit costs are multiplied by full on-line capacity of plant to calculate total variable costs (O&M, pumping).

Flow Approach Cost Analysis - Assumes only that capacity of plant used to serve East King County Water Supply Deficit in a given year is utilized. Variable unit costs are multiplied by East King County Water Supply Deficit to calculate total variable costs (O&M, pumping).

East King County Water Supply Deficit - East King County Regional Demand Forecast (October, 1988) minus 76 MGD.

ATTACHMENT 1

Table 2 - 37-YEAR FORECAST OF AVOIDED COSTS

Year	Fixed Firm Avoided Costs: Energy (cents/KWh) Winter Sep-Mar	Fixed Firm Avoided Costs: Energy (cents/KWh) Summer Apr-Aug	Fixed Firm Avoided Costs: Capacity ($/KW-mo) Jan-Dec	Nonfirm or Secondary Avoided Costs (cents/KWh) Annual Avg.
1988	0.55	0.31	3.00	1.25
1989	0.63	0.37	3.00	1.39
1990	0.72	0.43	3.00	1.39
1991	1.29	0.78	3.69	1.53
1992	1.81	1.33	4.53	1.57
1993	1.86	1.37	4.72	1.84
1994	1.90	1.39	4.89	2.00
1995	1.92	1.40	5.05	2.22
1996	2.00	1.45	5.31	2.34
1997	2.19	1.59	5.75	2.46
1998	2.51	1.84	6.40	2.58
1999	2.59	1.90	6.69	2.73
2000	8.40	4.05	9.02	2.89
2001	8.40	4.05	9.02	3.08
2002	8.40	4.05	9.02	3.23
2003	8.40	4.05	9.02	3.39
2004	8.40	4.05	9.02	3.56
2005	8.40	4.05	9.02	3.74
2006	8.40	4.05	9.02	3.93
2007	8.40	4.05	9.02	4.12
2008	8.40	4.05	9.02	4.32
2009	8.40	4.05	9.02	4.54
2010	8.40	4.05	9.02	4.77
2011	8.40	4.05	9.02	5.01
2012	8.40	4.05	9.02	5.26
2013	8.40	4.05	9.02	5.52
2014	8.40	4.05	9.02	5.80
2015	8.40	4.05	9.02	6.09
2016	8.40	4.05	9.02	6.39
2017	8.40	4.05	9.02	6.71
2018	8.40	4.05	9.02	7.05
2019	8.40	4.05	9.02	7.40
2020	8.40	4.05	9.02	7.77
2021	8.40	4.05	9.02	8.16
2022	8.40	4.05	9.02	8.57
2023	8.40	4.05	9.02	8.99
2024	8.40	4.05	9.02	9.45

Variable Firm Avoided Costs

1988 0.77 (cents/kwh)

[1]The first year variable firm avoided cost will increase to reflect inflation.

EAST KING COUNTY REGIONAL WATER SUPPLY

ANNUAL O & M COST FOR FILTRATION PLANTS

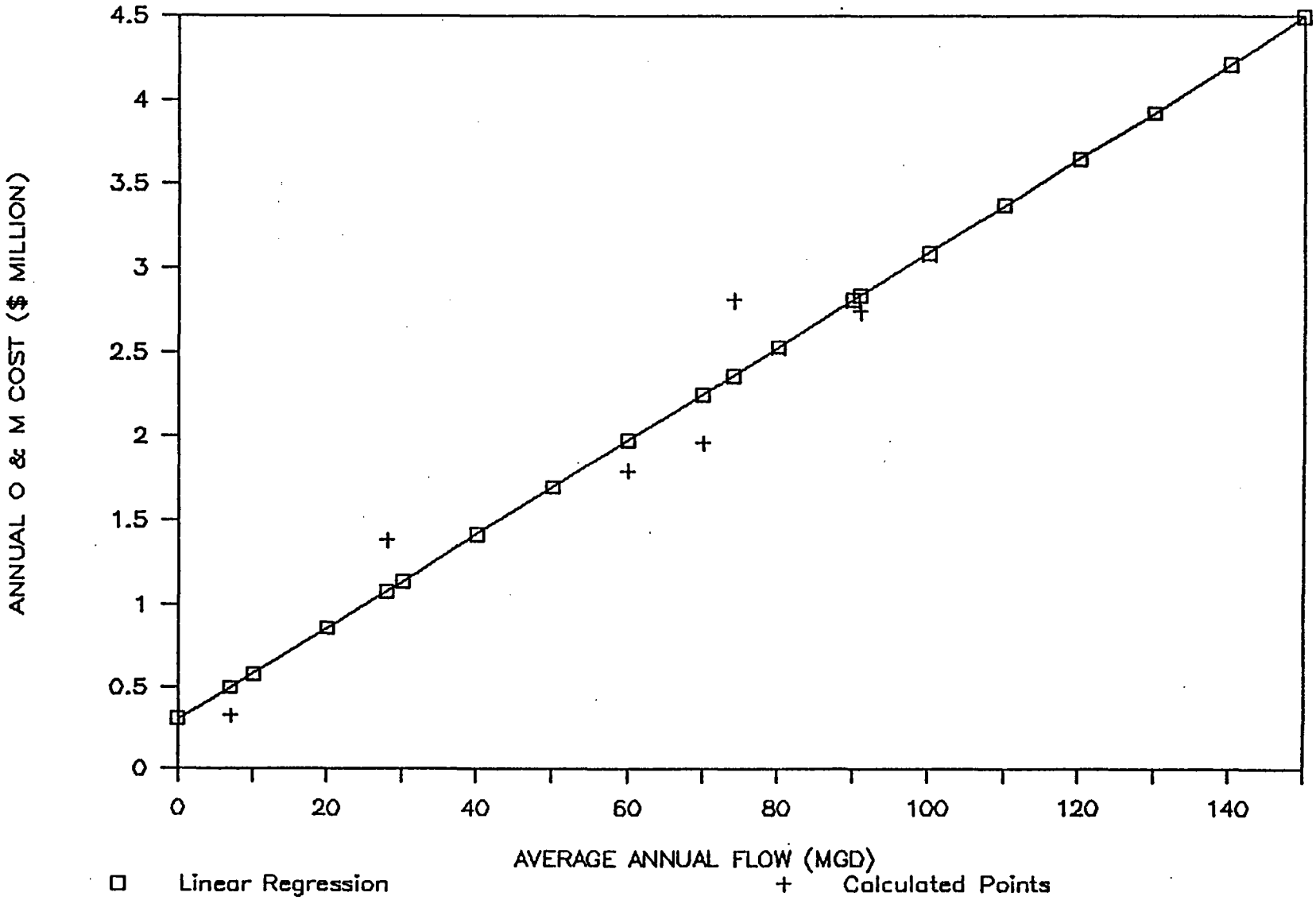


EXHIBIT IX-8

EAST KING COUNTY COORDINATED WATER SYSTEM PLAN
WATER SUPPLY OPTIONS - PRESENT VALUE COMPARISONS (1)
(1989 Dollars, Millions)

Supply Options	Yield Avg. (MGD)	Source Costs				Transmission Costs			Combined Costs
		Capital	O&M	Power Revenues	Total Present Value	Capital	O&M (2)	Total Present Value	Total Present Value
Cedar River (Phase I)	25	33.8	3.5	0.0	37.3	41.6	7.3	48.9	86.2
Cedar River (Phase II)	65	120.8	0.0	(20.3)	100.5	60.9	19.1	79.8	180.4
Walsh Lake	30	51.1	0.0	0.0	51.1	50.6	8.8	59.4	110.5
N. Fork Tolt River	47	78.7	29.1	0.0	107.2	42.7	0.0	42.7	149.9
Main Stem Snoqualmie	8	62.8	19.4	0.0	82.2	15.2	0.0	15.2	97.4
N. Fork Snoqualmie									
- High Dam	90	327.4	44.9	(93.6)	278.7	114.7	10.2	124.9	403.6
- Run-of-River	56	131.0	33.6	(30.8)	133.8	61.1	0.0	61.1	194.9
Skagit River	100	567.7	217.3	0.0	785.0	37.0	0.0	37.0	822.0
Issaquah Well Field	12	2.8	4.6	0.0	7.5	0.3	0.0	0.3	7.8
Sultan River (No. 1)	25	131.6	32.4	0.0	164.0	12.0	73.8	85.8	249.8
Sultan River (No. 2)	25	185.6	28.9	0.0	214.6	12.0	73.8	85.8	300.4

Footnotes:

(1) Block approach.
(2) Transmission O&M costs for Sultan (No. 1) and Sultan (No. 2) equal Snohomish PUD lost power revenues.

EXHIBIT IX–9

SUPPLY STUDIES SUBCOMMITTEE
SOURCE EVALUATION MATRIX [1]

SOURCE	YIELD AVE. MGD	PROJECT COST MILLIONS [2]	YIELD FIRM [3]	REGIONAL BENEFITS WATER	REGIONAL BENEFITS POWER	REGIONAL BENEFITS RECREATION	MEETS NEED 2020	MEETS NEED 2040	WATER RIGHT ISSUES	WATER QUALITY	EFFICENCY	RELIABILITY	ENVIRONMENTAL IMPACTS * INSTREAM	ENVIRONMENTAL IMPACTS * RIPARIAN	ENVIRONMENTAL IMPACTS * WETLANDS	ENVIRONMENTAL IMPACTS * OTHER [4]	* IMPLEMENTABLE [5]
CEDAR RIVER #1	25	86	◐	◐	◐	○	◐	◐	●	●	●	●	◐	●	◐	●	◐
CEDAR RIVER #2	65	180	●	●	●	○	●	◐	◐	●	●	●	●	○	○	●	◐
WALSH LAKE	30	111	●	●	○	○	◐	◐	●	●	●	◐	○	○	○	●	◐
NORTH FORK TOLT RIVER	47	150	●	●	○	○	●	◐	●	◐	●	●	◐	●	●	● [6]	●
MAIN STEM SNOQUALMIE	8	97	◐	○	○	○	○	○	●	◐	○	○	◐	●	●	●	◐
NORTH FORK SNOQUALMIE #1	90	404	●	●	●	◐	●	●	◐	◐	◐	●	●	○	○	○	○
NORTH FORK SNOQUALMIE #2	56	195	●	●	●	○	●	◐	◐	◐	○	●	◐	●	●	●	◐
SKAGIT RIVER	100	822	●	●	○	○	●	●	●	◐	○	●	◐	●	●	●	○
ISSAQUAH WELL FIELD	12	8	◐	◐	○	○	◐	◐	●	●	●	●	◐	●	◐	●	●
SULTAN #1	25	250	○ [7]	◐	○	○	◐	◐	◐	◐	○	●	◐	●	●	●	○
SULTAN #2	25	300	○ [7]	◐	○	○	◐	◐	◐	◐	○	●	◐	●	●	●	○

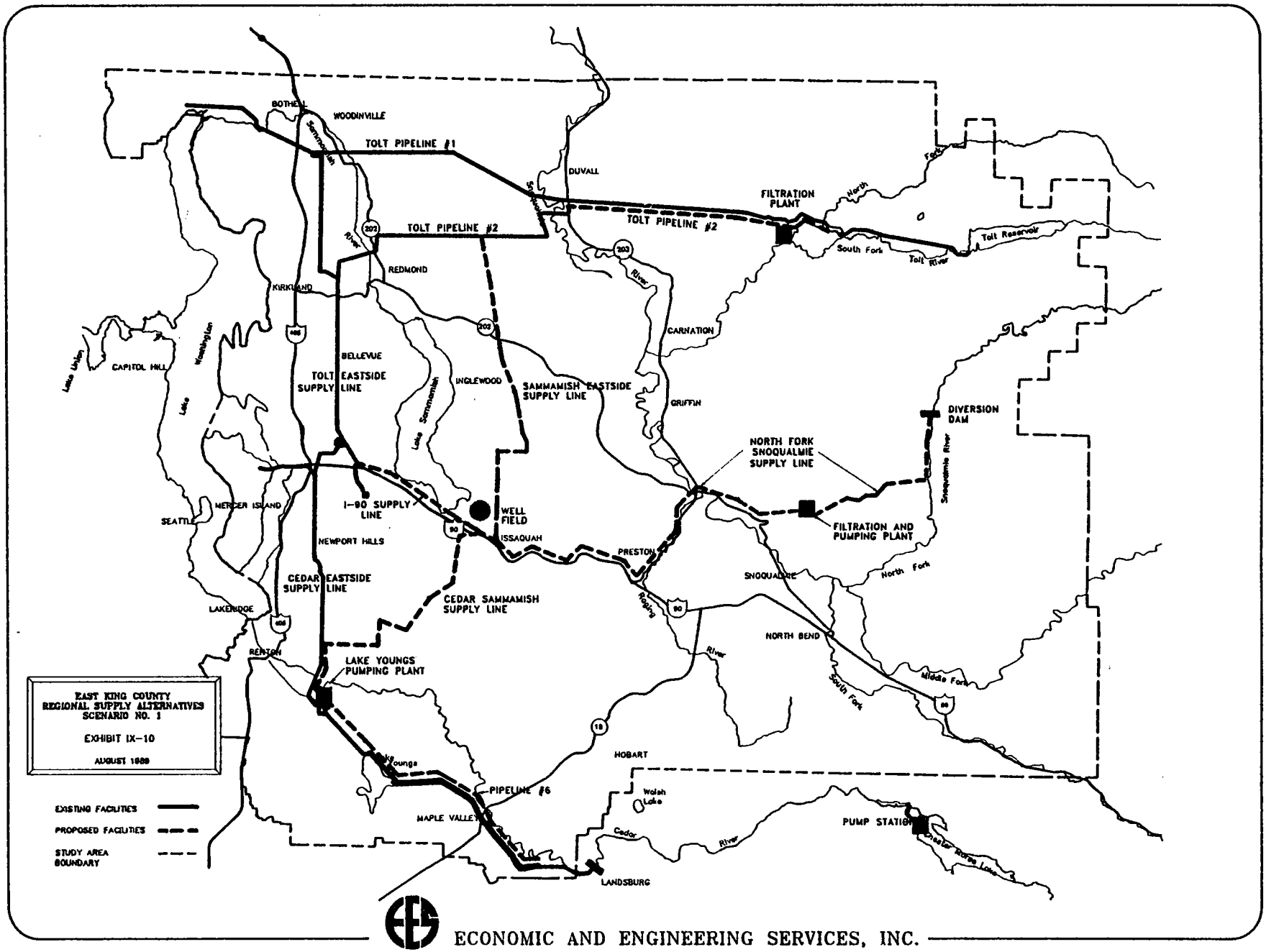
● HIGHLY FAVORABLE
◐ MODERATELY FAVORABLE
○ LOW FAVORABILITY

FOOTNOTES:

1. SOURCES ARE INDEPENDENTLY EVALUATED. NO RANKING OF SOURCES INTENDED.
2. PRESENT VALUE OF SOURCE & TRANSMISSION COSTS.
3. HIGHLY FAVORABLE WHEN GREATER THAN 25 MGD
   MODERATELY FAVORABLE FROM 5 TO 25 MGD
   LOW FAVORABILITY WHEN LESS THAN 5 MGD
4. PROTECTED AREA PROGRAM OF NW POWER PLANNING COUNCIL & RECREATIONAL IMPACTS.
5. BY YEAR 1997
6. EVALUATED ONLY ON BASIS OF WATER SUPPLY.
7. YIELD DECLINES TO ZERO BY YEAR 2020.

* ● LOW IMPACTS
◐ MODERATE IMPACTS
○ HIGH IMPACTS

ECONOMIC AND ENGINEERING SERVICES, INC.



ECONOMIC AND ENGINEERING SERVICES, INC.

EXHIBIT IX-10
EAST KING COUNTY
REGIONAL SUPPLY ALTERNATIVES

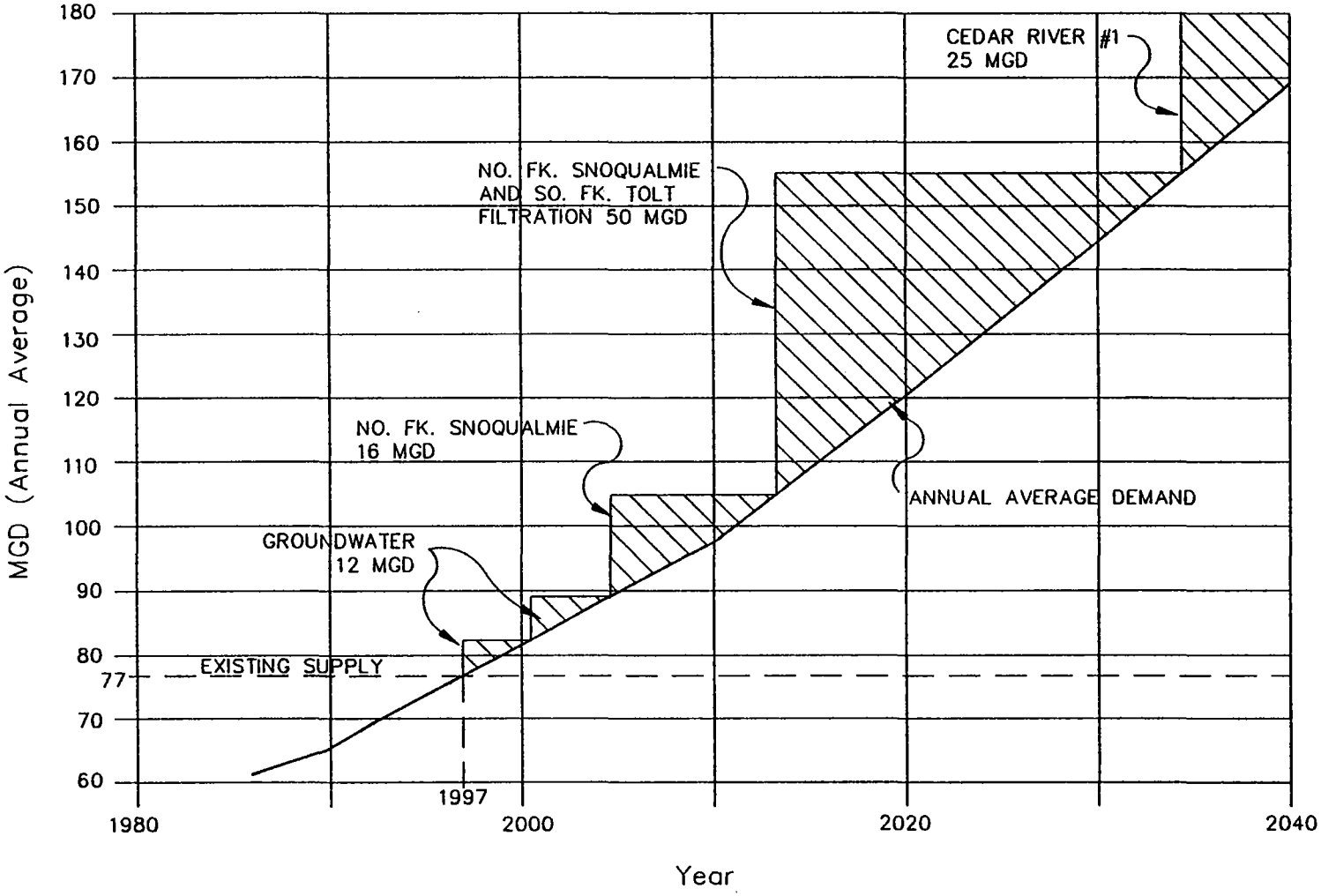
SCENARIO NO. 1

Project	Supply MGD (avg.)	Supply Year On-Line	Facility Source	Facility Cost Millions	Facility Year On-Line	Facility Transmission	Facility Cost Millions	Facility Year On-Line
Issaquah Wellfield	6	1997	3 wells, pump, pipe, related facilities & land purchase	2.1	1997	I-90 Supply Line	9.0	1997
	6	2000	3 wells, pumps, pipe, & related facilities	0.8	2000			
N. Fork Snoqualmie Run-of-River	16	2004	Diversion works, hydro facilities & filtration plant at 16 MGD (avg.)	94.9	2004	N. Fork Snoqualmie Supply Line; Sammamish Eastside Supply Line; N. Fork Snoqualmie Pumping Plant at 16 MGD (avg.)	72.6 61.5 8.1 (1)	2004 2004 2004
N. Fork Snoqualmie Expansion	40	2013	Expansion of Snoqualmie filtration to 56 MGD (avg.)	51.9	2013	Snoqualmie Pumping Plant expansion to 56 MGD (avg.)	4.0 (1)	2013
S. Fork Tolt Filtration	10	2013	Tolt Filtration Plant	13.0 (2)	2013	Tolt Pipeline #2 east of Snoqualmie River	50.9	2013
Cedar River No. 1	25	2035	Pumping plant, related works & Lake Youngs Supply Line No. 6	36.2	2035	Cedar-Sammamish Supply Line; Lake Youngs Pumping Plant	35.4 5.4	2035 2035
Total (new supply)	103			198.9		Combined Total = 445.8	246.9	
Additional cost of filtration for existing 53 MGD South Fork Tolt Supply (68.7) (3)								

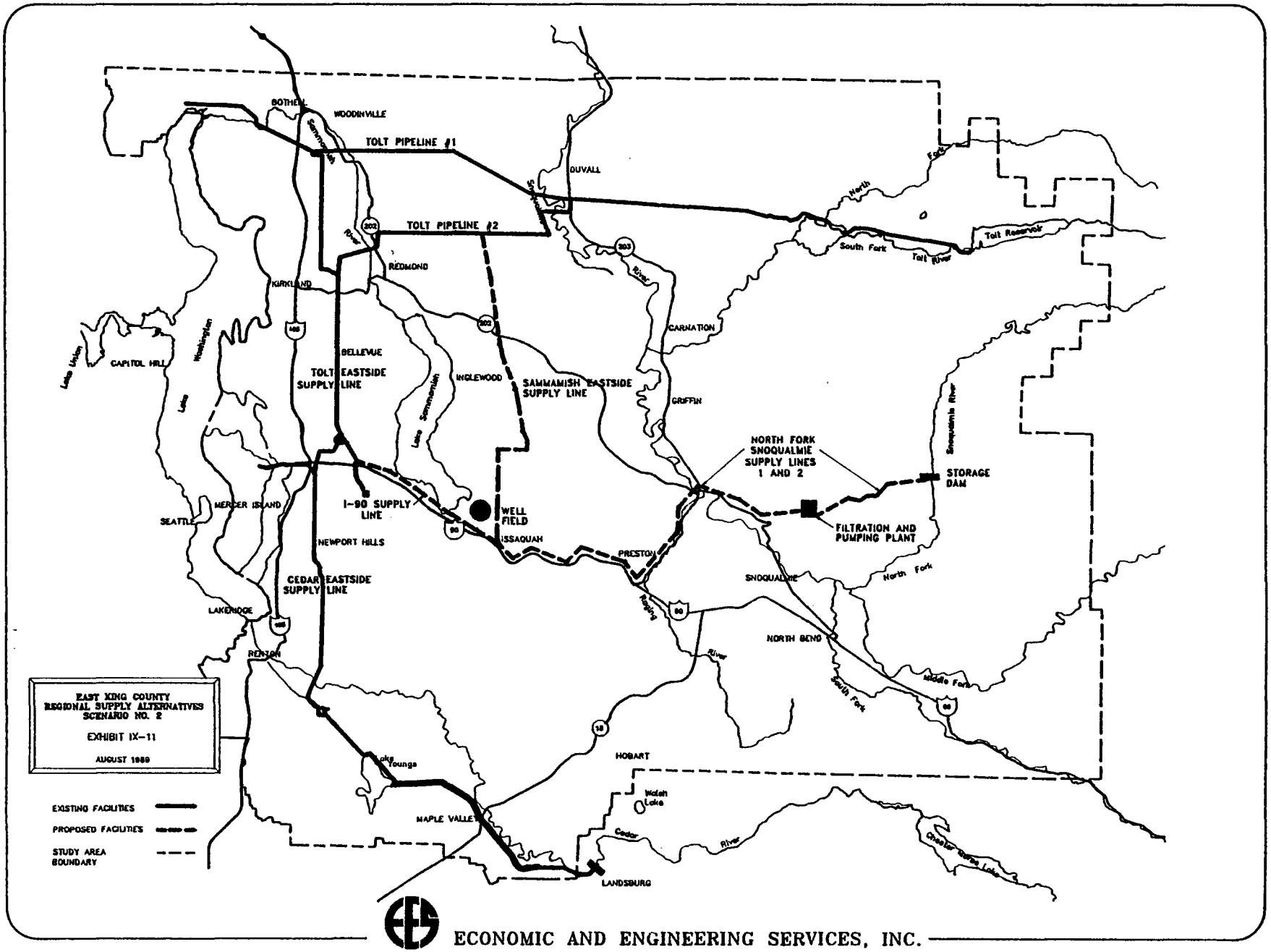
Footnotes:

(1) Cost of pumping station divided 2/3 in first phase and 1/3 in second phase.
(2) New supply cost calculated on basis of 20 MGD (peak flow).
(3) Filtration of existing South Fork Tolt River supply assumed required as a regulatory condition prompted by North Fork Snoqualmie diversion. This additional cost is assumed allocated to the general plant account for the existing system.

EXHIBIT IX-10
EAST KING COUNTY REGIONAL SUPPLY ALTERNATIVES
SCENARIO NO. 1



ECONOMIC AND ENGINEERING SERVICES, INC.



ECONOMIC AND ENGINEERING SERVICES, INC.

EXHIBIT IX-11
EAST KING COUNTY
REGIONAL SUPPLY ALTERNATIVES

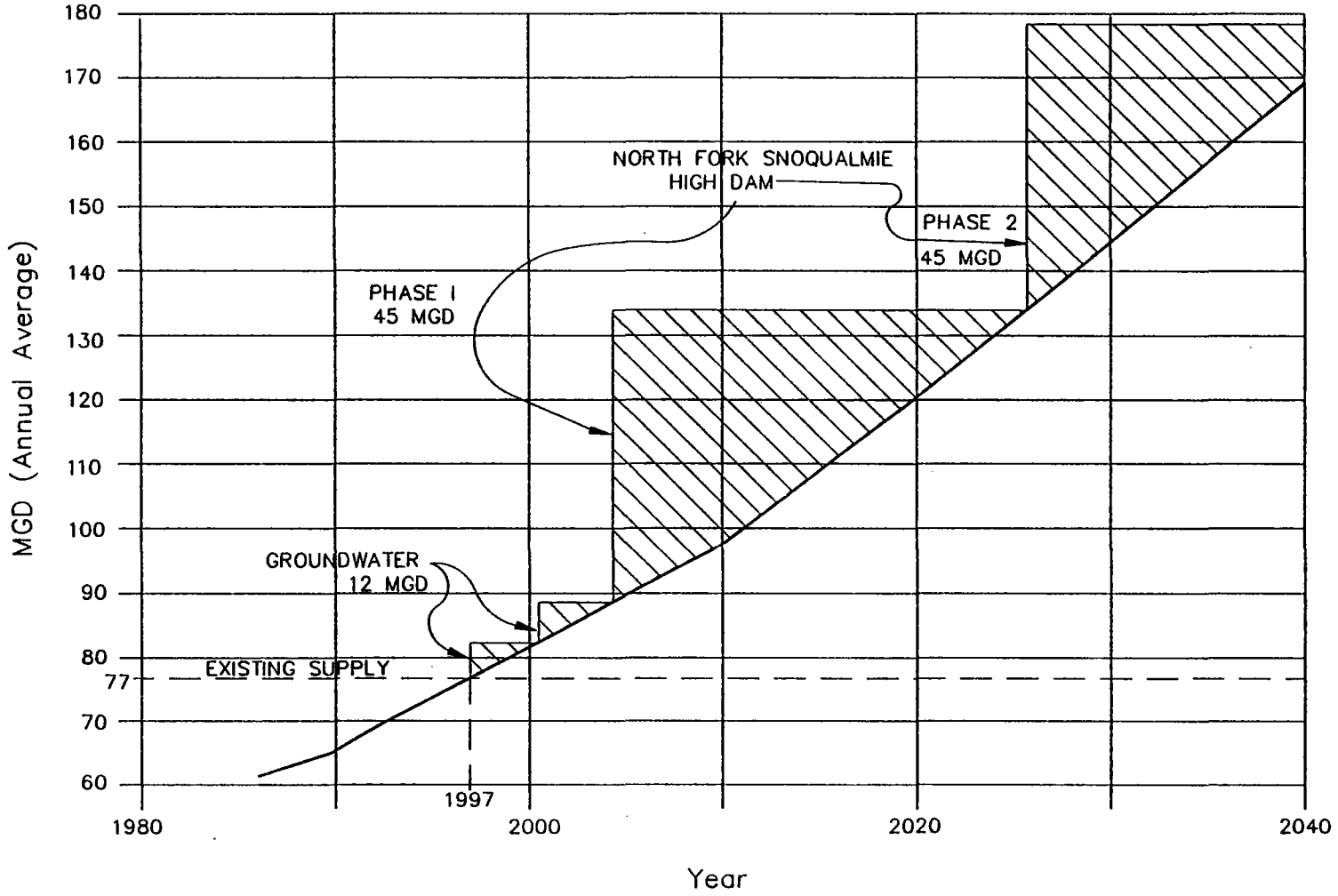
SCENARIO NO. 2

Project	Supply MGD (avg.)	Supply Year On-Line	Facility Source	Facility Cost Millions	Facility Year On-Line	Facility Transmission	Facility Cost Millions	Facility Year On-Line
Issaquah Wellfield	6	1997	3 wells, pumps, pipe, & related facilities	2.1	1997	I-90 Supply Line	9.0	1997
	6	2000	3 wells, pumps, pipe, & related facilities	0.8	2000			
N. Fork Snoqualmie High Dam	45	2004	Dam, penstock, power generation facilities, & first phase filtration plant at 45 MGD (avg.)	288	2004	N. Fork Snoqualmie Supply Line No. 1	70.6	2004
						Sammamish Eastside Supply Line	61.5	2004
						First Phase Pumping Plant	13.0 (1)	2004
	45	2025	Second phase filtration plant at 45 MGD (avg.)	59	2025	N. Fork Snoqualmie Supply Line No. 2	70.6	2025
						Second Phase Pumping Plant for total of 90 MGD (avg.)	6.5 (1)	2025
Total (new supply)	102			349.9			231.2	
						Combined Total = 581.1		

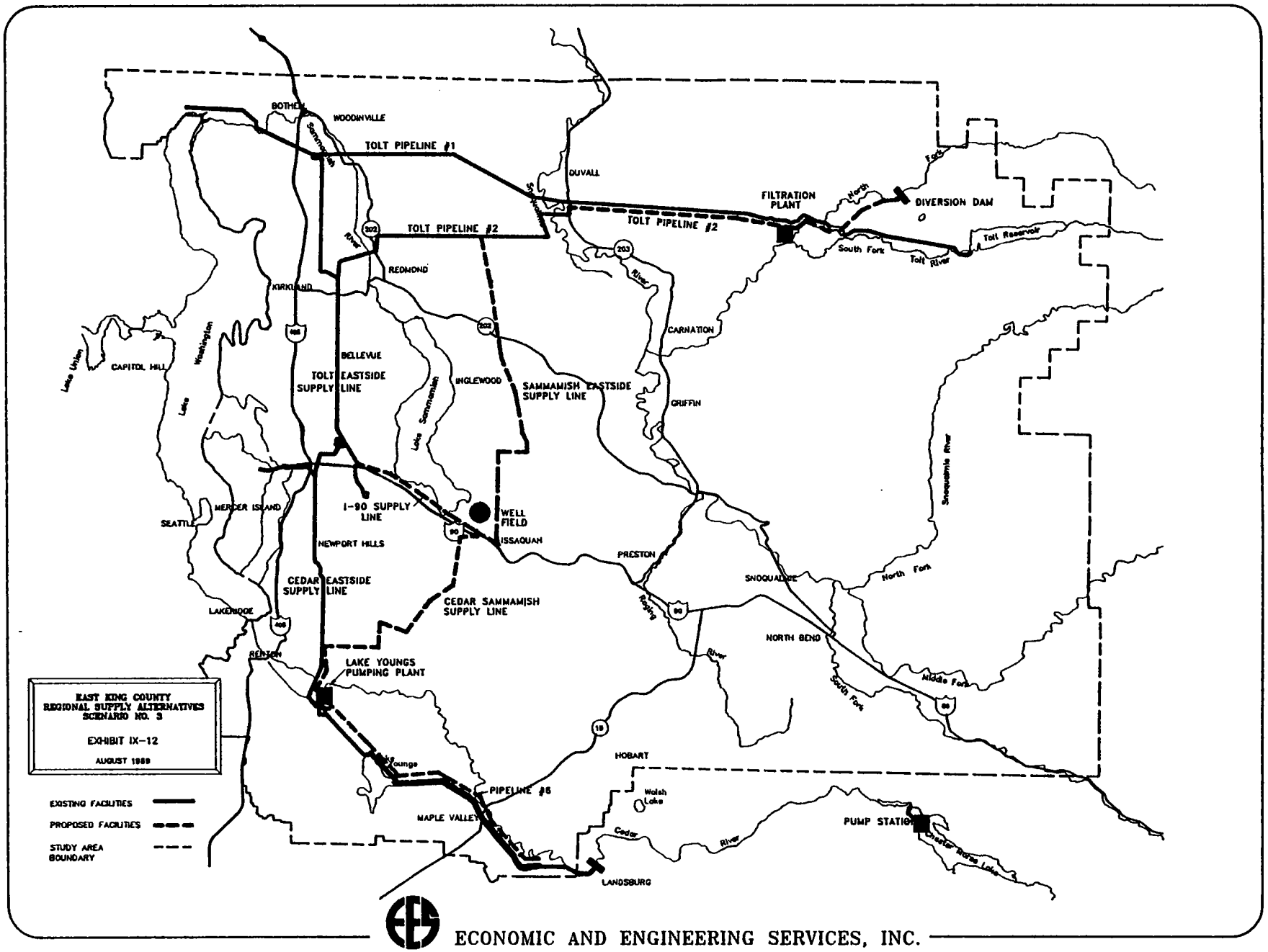
Footnotes:

(1) Cost of pumping station divided 2/3 in first phase and 1/3 in second phase. Summer/seasonal pumping required 3 months/year.

EXHIBIT IX-11
EAST KING COUNTY REGIONAL SUPPLY ALTERNATIVES
Scenario No. 2



ECONOMIC AND ENGINEERING SERVICES, INC.



ECONOMIC AND ENGINEERING SERVICES, INC.

EXHIBIT IX-12
EAST KING COUNTY
REGIONAL SUPPLY ALTERNATIVES

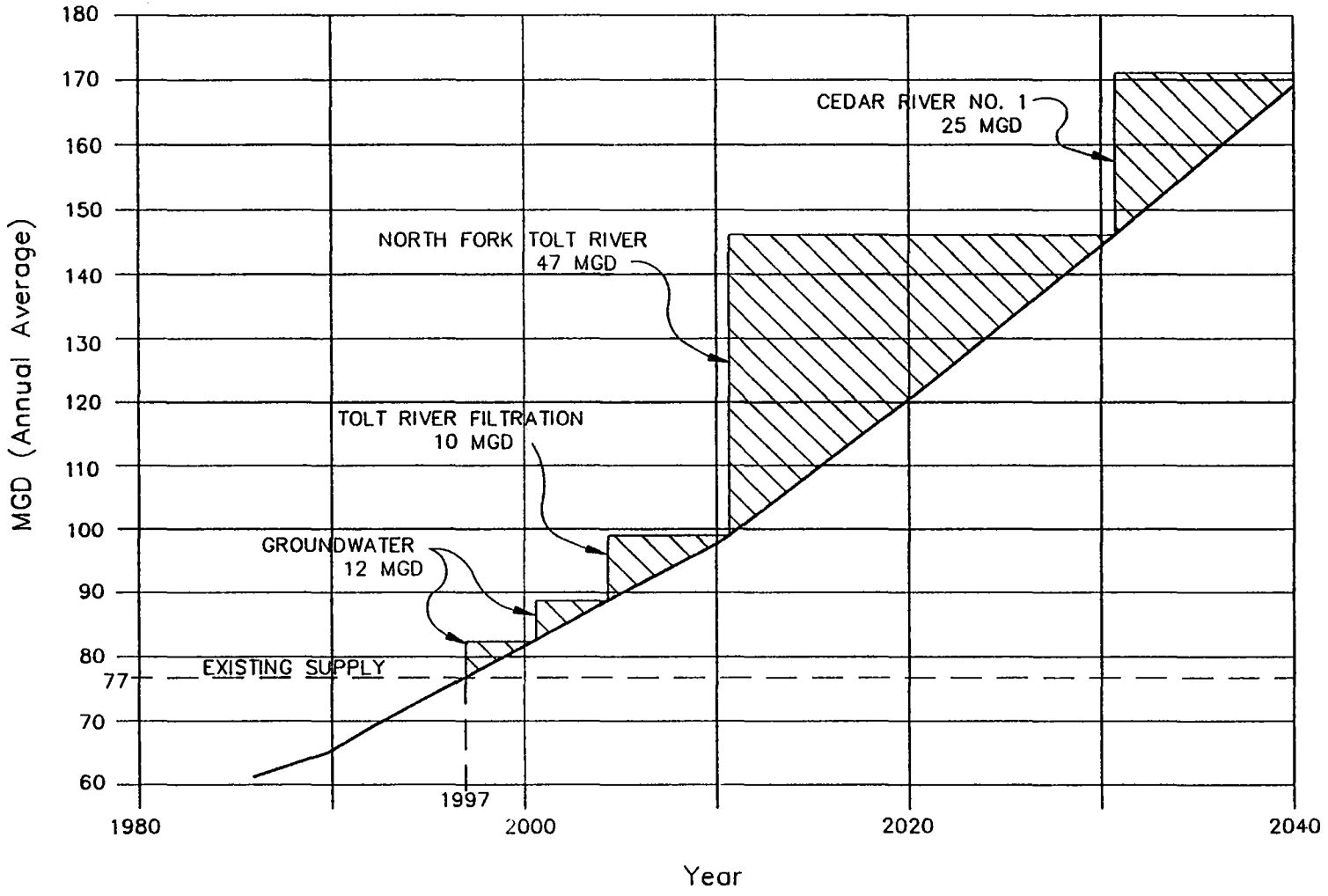
SCENARIO NO. 3

Project	Supply MGD (avg.)	Supply Year On-Line	Facility Source	Facility Cost Millions	Facility Year On-Line	Facility Transmission	Facility Cost Millions	Facility Year On-Line
Issaquah Wellfield	6	1997	3 wells, pumps, pipe, & related facilities	2.1	1997	I-90 Supply Line	9.0	1997
	6	2000	3 wells, pumps, pipe, & related facilities	0.8	2000			
Tolt River Filtration	10	2004	First phase filtration plant at 70 MGD (avg.)	13.0 (1)	2004	Tolt Pipeline No. 2 east of Snoqualmie River	50.9	2004
N. Fork Tolt River	47	2010	Diversion structure, pipeline, second phase filtration at 50 MGD (avg.) & related water supply facilities	87.0 (2)	2010	Sammamish Eastside Supply Line	45.6	2004
Cedar River No. 1	25	2030	Pumping plant & related pipeline	36.2	2030	Lake Youngs Pumping Plant	5.4	2030
			Lake Youngs Supply Line No. 6		2030	Cedar-Sammamish Supply Line	26.8	2030
Total (new supply)	94			139.1		Combined Total = 276.8	137.7	
Additional cost of filtration for existing 53 MGD South Fork Tolt Supply (68.7) (3)								

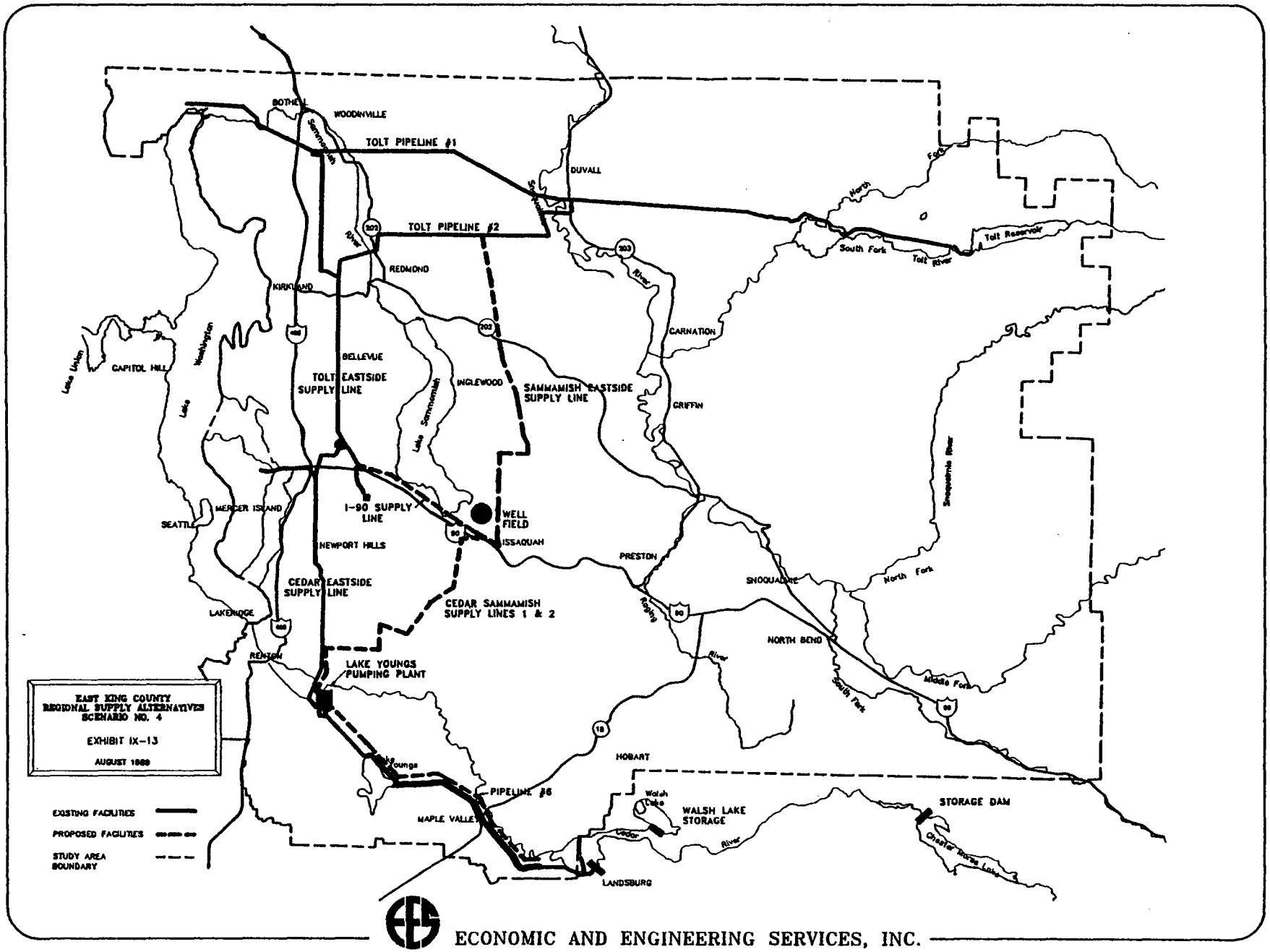
Footnotes:

(1) New supply cost calculated on basis of 20 MGD (peak flow).
(2) Hydropower cost not included; deferred to future project phase.
(3) Filtration of existing South Fork Tolt River supply assumed required as a regulatory condition prompted by North Fork Tolt diversion. This additional cost is assumed allocated to the general plant account for the existing system.

EXHIBIT IX-12
EAST KING COUNTY REGIONAL SUPPLY ALTERNATIVES
Scenario No. 3



ECONOMIC AND ENGINEERING SERVICES, INC.



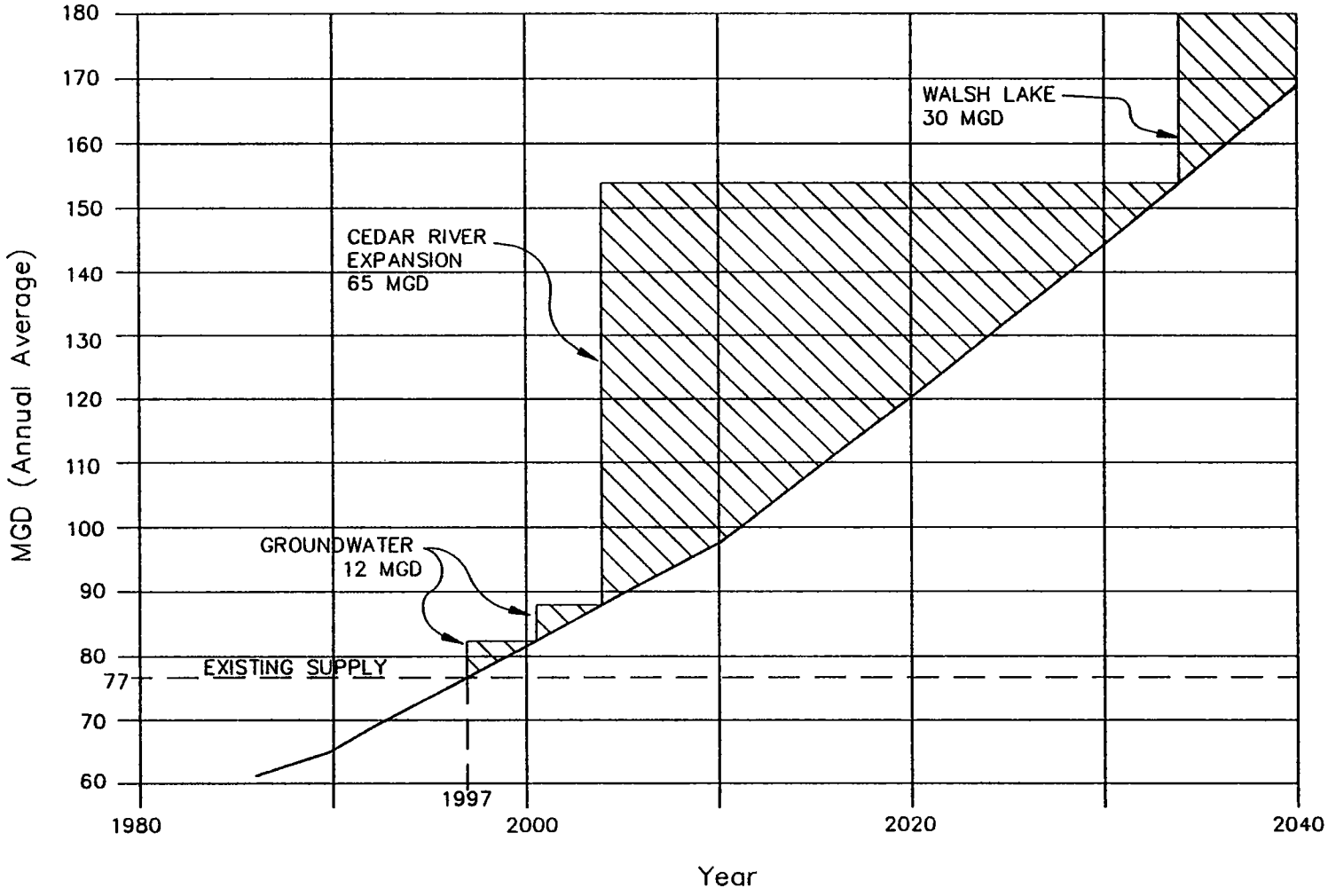
ECONOMIC AND ENGINEERING SERVICES, INC.

EXHIBIT IX-13
EAST KING COUNTY
REGIONAL SUPPLY ALTERNATIVES

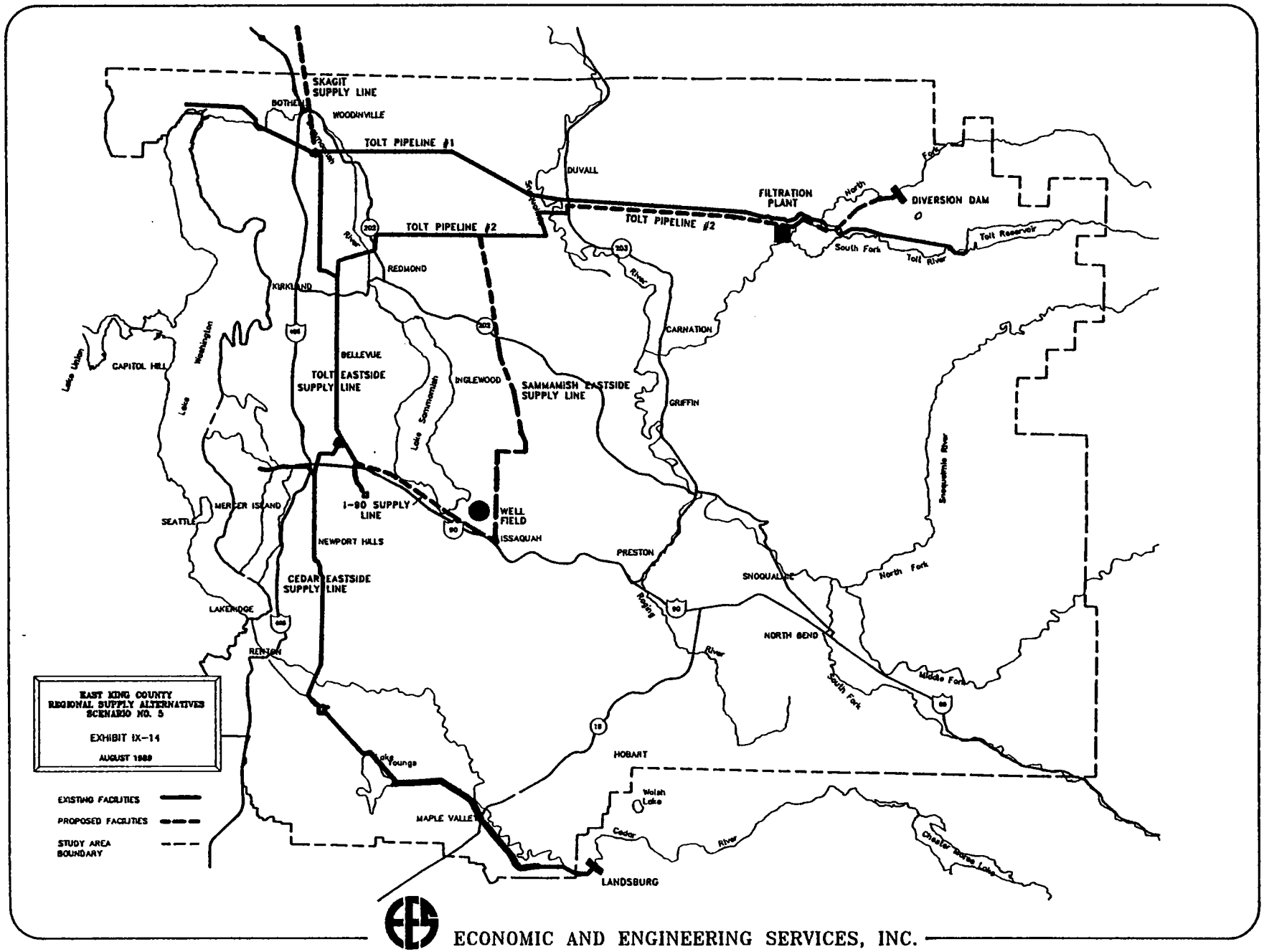
SCENARIO NO. 4

Project	Supply		Facility					
	MGD (avg.)	Year On-Line	Source	Cost Millions	Year On-Line	Transmission	Cost Millions	Year On-Line
Issaquah Wellfield	6	1997	3 wells, pumps, pipe, & related facilities	2.1	1997	I-90 Supply Line	9.8	1997
	6	2000	3 wells, pumps, pipe, & related facilities	0.8	2000			
Cedar River Expansion	65	2004	High dam at outlet of Chester Morse Lake with hydropower & water supply facilities	128.4	2004	Cedar-Sammamish Supply Line No. 1	80.5	2004
						Sammamish Eastside Supply Line	66.7	2004
			Lake Youngs Supply Line No. 6			Lake Youngs Pumping Plant	14.0	2004
Walsh Lake	30	2034	Dam & control works at outlet of Walsh Lake	53.7	2034	Cedar-Sammamish Supply Line No. 2	44.1	2034
			Diversion pipeline from Walsh Lake outlet stream to Cedar River			Lake Youngs Pumping Plant Expansion	6.5	2034
Total (new supply)	107			185.0			221.6	
						Combined Total = 406.6		

EXHIBIT IX–13
EAST KING COUNTY REGIONAL SUPPLY ALTERNATIVES
Scenario No. 4



ECONOMIC AND ENGINEERING SERVICES, INC.



ECONOMIC AND ENGINEERING SERVICES, INC.

EXHIBIT IX-14
EAST KING COUNTY
REGIONAL SUPPLY ALTERNATIVES

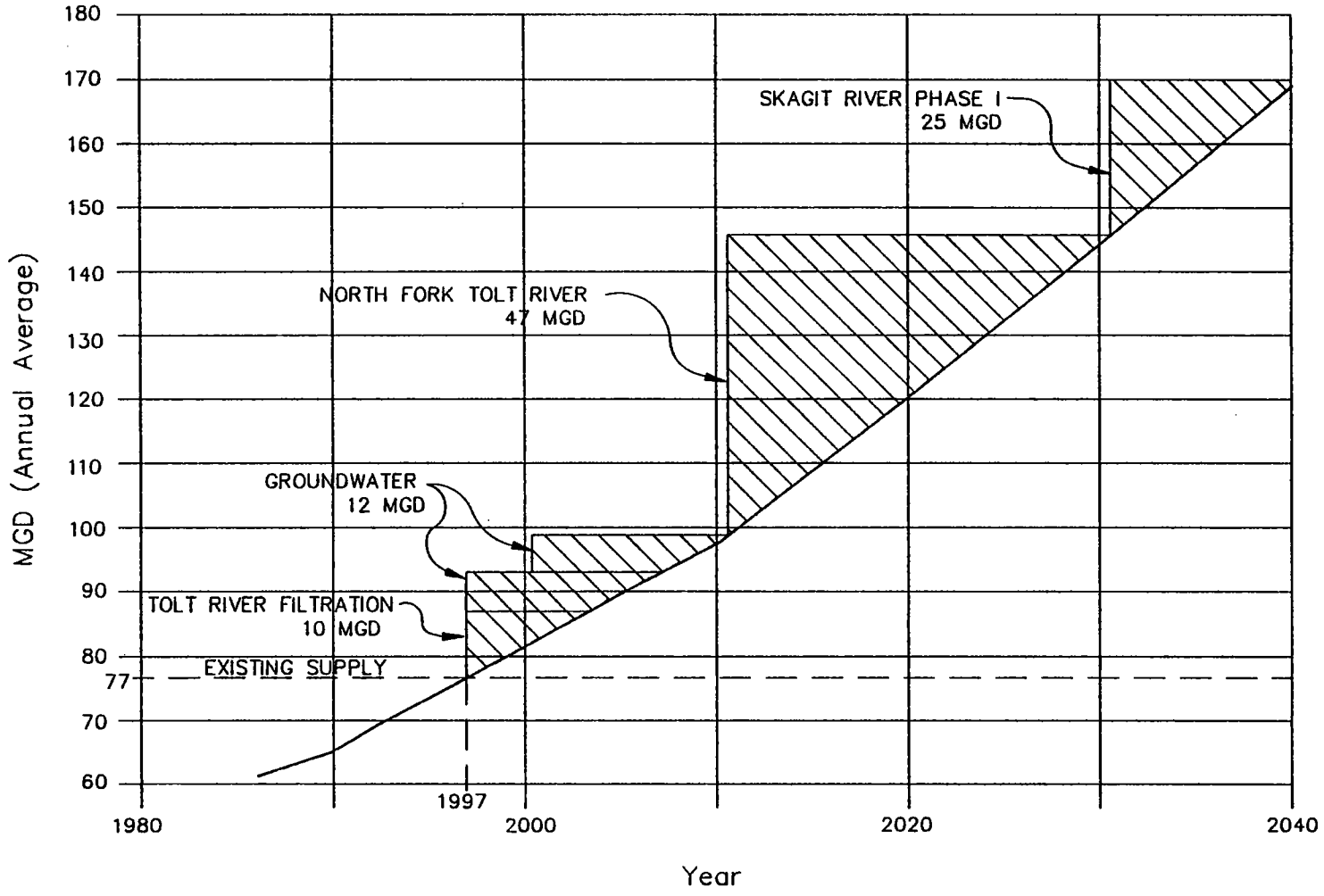
SCENARIO NO. 5

Project	Supply MGD (avg.)	Supply Year On-Line	Facility Source	Facility Cost Millions	Facility Year On-Line	Facility Transmission	Facility Cost Millions	Facility Year On-Line
Issaquah Wellfield	6	1997	3 wells, pumps, pipe, & related facilities	2.1	1997	I-90 Supply Line	9.0	1997
	6	2000	3 wells, pumps, pipe, & related facilities	0.8	2000			
Tolt River Filtration	10	1997	First phase filtration plant at 70 MGD (avg.)	13.0 (1)	1997	Tolt Pipeline No. 2 east of Snoqualmie River	50.9	1997
N. Fork Tolt River	47	2010	Diversion structure, pipeline, second phase filtration plant at 50 MGD (avg.) & related water supply facilities	87.0 (2)	2010	Sammamish Eastside Supply Line	45.6	2004
Skagit River, Phase I	25	2030	Pumping plant on Skagit River & filtration plant sized for 25 MGD (avg.) with single 100 MGD (avg.) transmission line	421	2030			
Total (new supply)	94			523.9			105.5	
						Combined Total = 629.4		
Additional cost of filtration for existing 53 MGD South Fork Tolt Supply (68.7) (3)								

Footnotes:

(1) New supply cost calculated on basis of 20 MGD (peak flow).
(2) Hydropower cost not included; deferred to future project phase.
(3) Filtration of existing South Fork Tolt River supply assumed required as a regulatory condition prompted by North Fork Tolt diversion. This additional cost is assumed allocated to the general plant account for the existing system.

EXHIBIT IX-14
EAST KING COUNTY REGIONAL SUPPLY ALTERNATIVES
Scenario No. 5

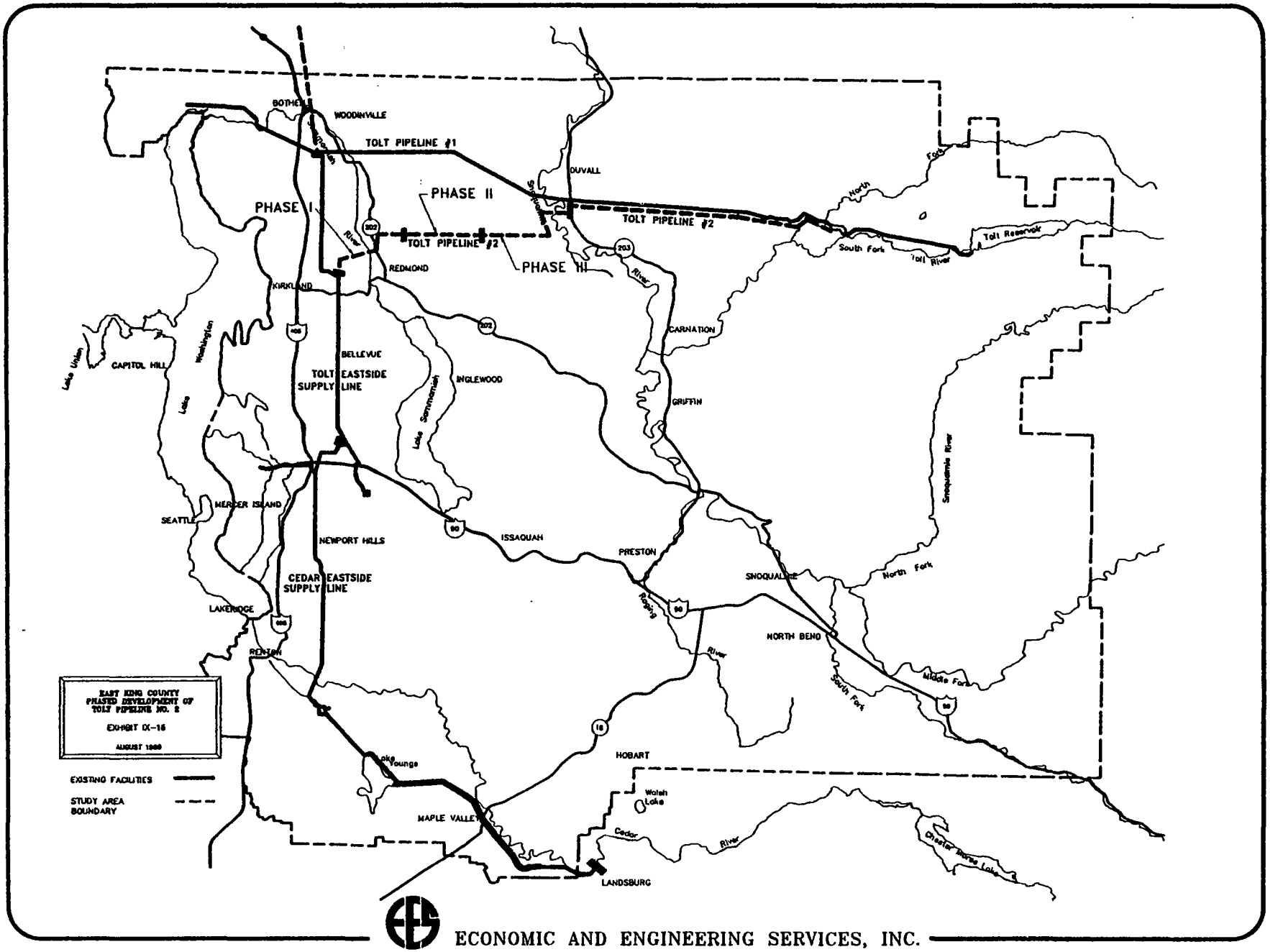


ECONOMIC AND ENGINEERING SERVICES, INC.

EXHIBIT IX-15
EAST KING COUNTY COORDINATED WATER SYSTEM PLAN
REGIONAL SUPPLY ALTERNATIVES - PRESENT VALUE COMPARISONS (1)
1989 DOLLARS (MILLIONS)

Scenario	Yield Avg. (MGD)	Source Costs				Transmission Costs			Combined Cost	
		Capital	O&M	Power Revenues	Total Present Value	Capital	O&M (2)	Total Present Value	Total Present Value	Unit Value $/MGD
Scenario No. 1	103	$133.8	$24.9	($29.4)	$129.3	$166.0	$ 1.1	$167.1	$296.4	2.88
Scenario No. 2	102	$268.7	$22.0	($66.0)	$224.8	$158.4	$ 1.3	$159.7	$384.5	3.77
Scenario No. 3	94	$ 88.0	$14.1	$ 0.0	$102.1	$ 96.3	$ 0.4	$ 96.7	$198.8	2.11
Scenario No. 4	107	$117.1	$ 4.5	($14.3)	$107.4	$151.0	$16.7	$167.7	$275.1	2.57
Scenario No. 5	94	$196.5	$26.2	$ 0.0	$222.7	$ 97.6	$ 0.0	$ 97.6	$320.3	3.41

(1) Flow approach.



ECONOMIC AND ENGINEERING SERVICES, INC.

SECTION X

SECTION X

JOINT PROJECT OWNERSHIP, ADMINISTRATION, AND FINANCING

1. INTRODUCTION

Additional supply must be developed to meet the projected demands for the East King County service area. Currently, the eastside supply comes from the Seattle Supply System and individual groundwater supplies.

During the early 1980s, there was considerable discussion concerning the City of Bellevue, the Eastside Venture Group, or other organizations assuming a leadership role in the development and management of the supplies necessary to meet the eastside water needs. This discussion was precipitated by the question of management and control of future supply options, financing and associated rate setting, and the question of equity in the Seattle Supply System.

The Eastside Venture Group joined with the City of Bellevue to evaluate an independent supply option from the North Forks Snoqualmie River. This study precipitated considerable debate and, ultimately, led to the decision to develop this Coordinated Water System Plan (CWSP) and the formation of the East King County Regional Water Association (EKRWA) to manage and direct the development of this plan.

One of the primary objectives of the CWSP is to prepare a supply development strategy for East King County's future and then to evaluate the appropriate program for developing, financing, controlling, and managing the supply system. Since Seattle already has a major role in this program, they have participated in the discussions and have encouraged the EKRWA to develop a specific program and/or proposal that can be jointly considered.

2. ALTERNATIVES - SUPPLY DEVELOPMENT AND OWNERSHIP

The alternative evaluation was guided primarily by the objective of developing a partnership with the Seattle Water Department (SWD) and other existing regional water suppliers including the Cities of Tacoma and Everett, and other utilities or regional organizations such as the South King County Regional Water Association (SKRWA) and Pierce County Regional Water Association (PCRWA).

To facilitate the evaluation, a concentrated 1-1/2 day meeting was held to review all options and to develop a common understanding of the objectives and regional management philosophies.

The review of supply development and management alternatives addressed several of the key issues surrounding supply ownership and financing. It was recognized that supply ownership, whether it be in capacity rights or in physical facility ownership, will require substantial debt and cash financing. Therefore, the program developed must consider the magnitude of the new supply requirements, their incremental development, the associated pipelines, interties, and joint storage facilities, and the possibility of purchasing existing supplies from individual EKRWA members or a portion of the Seattle Supply System.

There was recognition that the supply options include a new surface impoundment or run-of-river project, aquifer recharge, new groundwater development, system interties with South King County, Tacoma, and Everett, and the enhancement and optimization of existing supply systems.

Several participating utilities suggested the possibility of transferring existing groundwater supply systems to EKRWA for ownership and operation as an element of the overall EKRWA supply system. It was also recognized that the purchase of a groundwater supply system from EKRWA members would be similar in concept to the purchase of a portion of the Seattle supply system. The issue of return on the investment or credit for past investments would be developed so it would have common application to either an EKRWA member or Seattle, if purchase of an existing supply was deemed appropriate. The return on investment includes consideration of both new facilities and past investments.

The establishment of a program that would lead to management and control of the supply, both new and eventually the existing Eastside supply was identified as a top priority. Therefore, in the development of the recommended program, EKRWA needs to place a priority on how to establish participation in the financing and development of new supply sources, while further evaluating how to incorporate the use and eventual management of a portion of the Seattle and individual member supply systems contributing to the EKRWA supply system.

The following four alternatives were evaluated further against the objectives identified.

A. Continue Status Quo

This would provide for Seattle to expand their role as a regional water supplier and through appropriate contracts, provide for the future water supply needs of all designated purveyors. The individual purveyors would, presumably, continue to develop groundwater resources and manage those resources conjunctively with the Seattle surface supply system. The future of EKRWA as a planning agency would need to be addressed.

B. EKRWA as Developer/Manager

Implement a program that would provide for the implementation of a program for EKRWA to manage and control regional supply systems providing service to the EKRWA service area. The program would include an inventory of existing wells and a definition of what constitutes "regional."

C. EKRWA/Phased Development Program

Using B., above, as a long-term objective to guide decisions, develop a program that provides for the following:

(1) Develop a new EKRWA block purchase contract from Seattle's existing supply system, with non-participating purveyors to continue with existing contracts.

(2) Seattle and EKRWA prepare a joint development and management program for new supplies with EKRWA participating in ownership in new supply systems in excess of the quantities of water Seattle needs to meet their retail and current contractual water sales obligations.

(3) EKRWA initiate a program to jointly develop existing purveyor supplies for conjunctive use with regional supplies.

D. Defer Regional Management Responsibility

Following completion of the CWSP, dissolve the EKRWA and defer to Seattle for regional supply planning, with contractual services to determine the cost and future supply program.

Based upon the discussion at the meeting and subsequent review by the WUCC, Alternative C was determined to best represent the collective interest of EKRWA members and WUCC and that this alternative should be used to guide the final recommendations in the CWSP.

This alternative would provide for the long-term development of supplies by the EKRWA, the possible re-negotiations for the purchase of water from Seattle through a block purchase arrangement, the possible purchase of existing well fields of EKRWA members and supply facilities from Seattle. This approach will provide for the objectives identified by EKRWA and WUCC members, would allow Seattle to continue in their present mode of operation with existing facilities while dealing with the

eastside as a larger unit, would promote a more efficient method of managing the supply systems and would optimize the conjunctive use of surface and groundwater resources.

EKRWA would be responsible for the internal wheeling of water between EKRWA members, ensuring the timely development of incremental sources of supply in cooperation with Seattle, and for maximizing efficiencies and minimizing costs for the EKRWA members.

Exhibit X-1 graphically presents the general concept of how the various supplies would be merged into a single "block" of water to be developed, wheeled, and managed by EKRWA. This Exhibit serves as the framework for the EKRWA Supply Strategy.

The prioritization of the options on development of new supply, appropriate transmission and storage facilities, and the potential purchase or assumption of ownership of existing groundwater supply systems, as well as a portion of the Seattle supply system, will evolve from the CWSP planning process into the long-term Joint Project Ownership and Administration Strategy for the East King County service area.

3. ALTERNATIVES - PROJECT AND ADMINISTRATION FINANCING

To implement an independent supply management program for the East King County area, the EKRWA will need to establish a long-term project and administrative financing plan.

The options include a menu of alternative financing tools to be applied on a case-by-case basis following additional study. Some of the financing options include: joint debt financing with Seattle, Bellevue, and other larger water utilities; pooling the revenue bond financing capabilities of the EKRWA members for proportionate financing of new facilities; development of a joint financing mechanism that may require legislative clarification of the authority of the EKRWA to sell its own bonds; and, the development of cash financing, i.e., system development fee program designed to provide a pool of money for EKRWA to participate in supply development programs.

The study has been completed on the premise that existing authorities and joint financing capabilities will be used as the preferred alternative, without precluding the other alternatives as future options. Alternative approaches to financing will be developed with the understanding that different projects may take different approaches to achieve the long-term objective.

To minimize the need for new capital and operating expenditures, EKRWA could contract for laboratory services; for large project design/construction management; and, for the operation of groundwater and regional supply systems. These contracts could be with Seattle or other appropriate contract agencies.

Exhibit X-2 graphically represents the concept of a "bank of water" to supply the Eastside water needs and a regional cost sharing approach which would merge or combine all supplies and have a single rate. To use this approach, the cost of transporting the supply to set delivery points would also have to be included to establish an EKRWA supply system common to all members.

The financing concept would follow the same objective--a shared responsibility to provide the EKRWA supply at the least cost. Different customer classes may represent subregions to reflect pumping and capital cost to get water to the delivery points.

Long-term financing options are available based upon existing legislative authorities. In general, the source of funds will come from monthly user charges and system development fees based upon the services provided and benefits received from the construction of regional supply facilities. A limited amount of funds may come from government grants and loans for either studies or selected special projects.

To finance the recommended supply plan, a combination of debt financing through the use of revenue bonds, possible low interest loans from the State of Washington, and cash financing provided through the user charge and system development fees would provide the basis for meeting the cash flow requirements. Joint financing with the SWD and the various participating utilities also provides flexibility which will enable the EKRWA to obtain lower interest rates and necessary funds to proceed with the desired schedule.

Exhibit X-3 presents a graphic presentation of the possible source and application of funding for the recommended plan. The initial proposal anticipates the regional supply program will be divided into three different wholesale supply categories as follows:

A. Seattle retail supply area;
B Seattle wholesale supply area to non-RWA members; and
C. EKRWA member utilities.

Based upon this financing framework, the financing plan for categories A and B would be the responsibility of the SWD and the associated purveyors. Category C, the EKRWA members, would develop a uniform financing program in partnership with the SWD. The ultimate objective is for the EKRWA to assume a greater ownership and management role in the supply system.

The proposed method of generating revenue with the financing of the facilities is based upon allocating those costs that will benefit all water customers to the monthly user charge. These costs include the normal operation and maintenance, administration, and general system upgrade to meet new regulatory requirements.

A monthly user charge would also incorporate a renewal and replacement element assigned to the appropriate customer category based upon a defined renewal and replacement program.

Allocation of the cost for new capital facilities will depend upon the agreements reached upon cost sharing and method of financing. The allocation could incorporate three different approaches whereby one method would be to continue the old water/new water financing of existing facilities with the revenue generated through an allocation to the monthly user charge. Following an agreement upon financing specific regional facilities, a combination of assignment to the monthly user charge and to a one-time system development fee for regional facilities would provide flexibility for revenue generation from the appropriate customer category. The amount of financing through this two-part program would depend upon the capital construction program approved by the EKRWA. This would include the financing for specific pipelines, development of new well fields, joint financing of storage and/or system interties, and the purchase of existing supply systems from EKRWA members and/or a portion of the Seattle system.

The system development fee would be based upon an equivalent meter as required by the individual customer of the RWA member. Through an inventory of equivalent meters on an annual basis, each new equivalent meter would be assessed a system development fee for the regional supply system owned and/or managed by the EKRWA. This would be a capacity buy-in by the new customer and would be passed directly to the agency that assumed responsibility for financing the capital facilities. For those EKRWA members who already have a system development fee, the system development fee would be increased to have a two-part allocation: (1) the regional supply; and (2) the utilities internal transmission, storage, and supply system.

Due to the high cost of new supply systems, it is probable that the system development fee would be used to finance only a portion of the supply system with the remainder being financed through an assignment to the monthly user charge.

Through this combination of financing, the new customer placing the burden upon the existing system would be assigned a portion of their proportionate share of the supply system cost through the system development fee. This would reduce the need for the new water method of financing for wholesale customers. Additional discussions with the SWD is necessary to determine how this method of financing would be integrated into the present purveyor contracts so as to clarify the appropriate cost allocations for supply systems.

Several projects are recommended within the proposed Supply Plan that require immediate financing. If the regional system development fee program was in place, a portion of these projects could be financed through cash from the funds generated from the system development fee. However, since the projects will require near term action, the use of revenue bonds with debt service covered by user charges and system development fees would be the recommended approach.

Several options exist in the issuance of debt service for the regional projects. These include issuance of the debt service by a major utility such as Seattle with contractual guarantees from the EKRWA members; the pooling of bond sales by the EKRWA members themselves into a single issue; and the possibility of the EKRWA issuing the bonds with contractual guarantees from the members.

The two options provide an opportunity to further the partnership between the SWD and the EKRWA.

The recommended financing plan for the East King County Regional Supply System will depend on the final schedule for the Capital Improvement Program, the final interlocal agreement creating the EKRWA as an operating organization, and the agreements that are developed between the SWD and EKRWA in a partnership for meeting future needs.

4. ADMINISTRATION AND OPERATION

There are currently 57 water utilities with 50 or more customers providing water service in the East King County service area. These utilities range in size from 50 customers up to the City of Bellevue. Several alternatives were evaluated for the regional water organization. One option provided for the SWD to continue as the regional supplier. Another option was actually implemented in the form of an Eastside Venture Group to assist Bellevue in the study and evaluation of the North Fork Snoqualmie River as a regional supply.

In South King County, the Regional Water Association (RWA) was established through bylaws and interlocal agreements, establishing itself as a permanent representative of the South King County utilities. Pierce County water utilities established a similar RWA and continues to assist in the implementation of the CWSP and in developing a Utility Data Management Center.

The water utilities in northern Snohomish County created a similar organization called "Sno-Water" using the working documents of the two King County RWAs as a model.

During the establishment of the charter and agreements for the EKRWA, the decision was made to initially limit the role of the EKRWA to the completion of the CWSP. This was done with the understanding that during the planning

process, the need for a permanent EKRWA would be evaluated, defined, and then revisited in terms of determining whether a new charter should be established.

If the East King County utilities are to organize as a group and proceed with the implementation of a management and supply development program, a regional organization with appropriate authorities must be established.

During the planning process, the EKRWA and WUCC discussed the role of a permanent EKRWA, the desirability of continuing with the same basic philosophy whereby the EKRWA cannot commit any of its members to the financial contractual liability except as specifically agreed to, and that a METRO-type of organization that would have independent bonding authority was not necessary to achieve the current primary objectives of the participants.

If EKRWA is to become the representative spokesman and manager of the East King County supply development program, a revised charter is required to establish the specific role of the EKRWA, to define the staffing and administrative costs associated with the program, and to provide for a continuation of its current role in the negotiations and implementation strategies with Seattle and the regulatory agencies.

If EKRWA is not to continue, the supply development options would be limited and a status quo mode of operation would be most likely necessary.

In addition to the development, financing, and operation of an Eastside supply system, the following probable roles for EKRWA were identified:

A. Develop and manage a Utility Data Management Center.

B. Provide lead role in planning for East King County water supply needs.

C. Provide liaison with the federal, State, County, and local regulatory and legislative water-related programs for Eastside.

D. Develop and assist in implementing the Eastside Supply program consistent with Eastside utility objectives.

E. Assist in implementing and managing a Regional Conservation Program (including public education in the schools and the general public).

F. Coordinate regional supply program with other RWAs and major suppliers.

To achieve the primary objective of the EKRWA and WUCC as identified in the CWSP, a strong and permanent regional organization will be required.

To become a permanent organization and assume regional supply development and management responsibility, a long-term budgeting and administrative program must be developed.

The roles and responsibilities of the EKRWA staff, its members, and the SWD must be established to minimize duplication. The program must also clarify the anticipated relationship between EKRWA and individual eastside purveyors and provide for an equitable basis for assessing the cost of administration and program development.

EXHIBIT X-1

EAST KING COUNTY SUPPLY STRATEGY

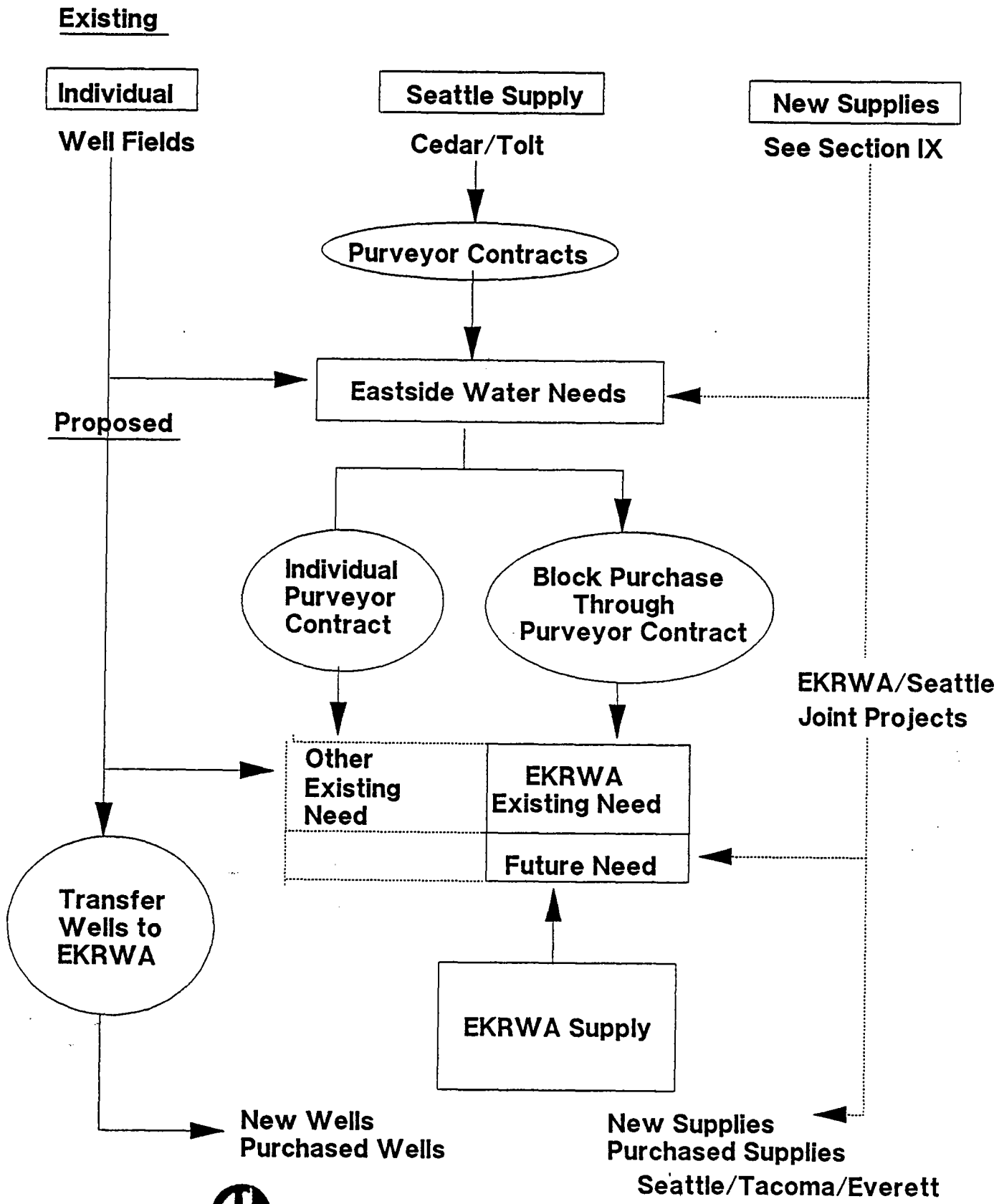
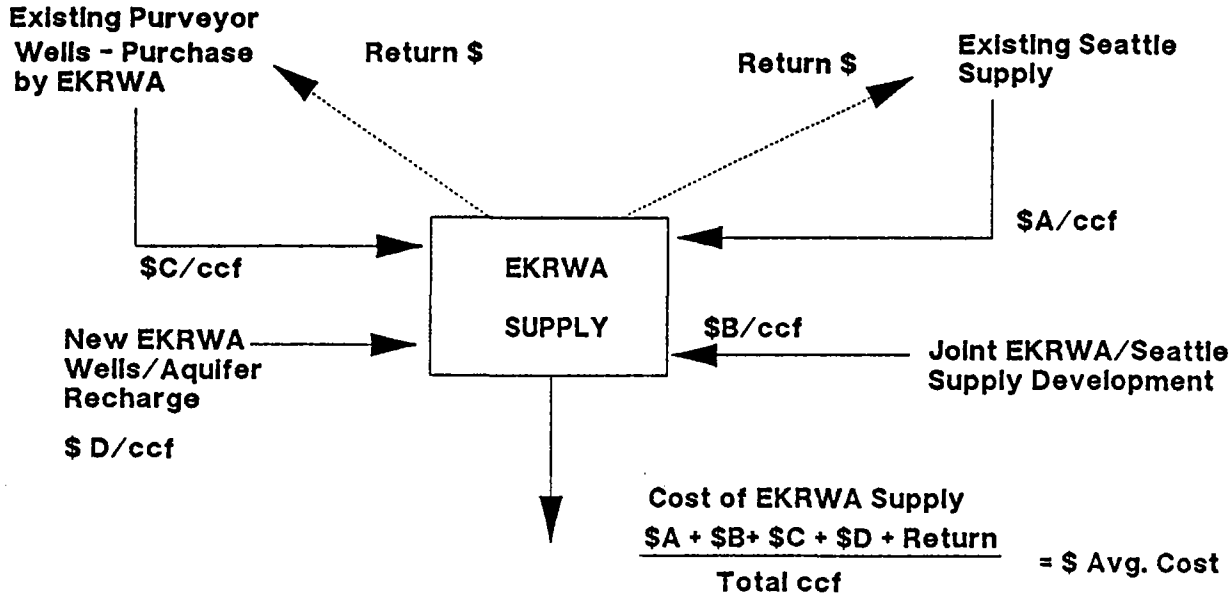


EXHIBIT X-2

JOINT OWNERSHIP AND FINANCING

Supply Purchase & Development



Note: Purchased supplies from Seattle and Purveyors (wells) must incorporate return on equity to original owner. Cost of Regional transmission system must also be incorporated.

Supply Financing

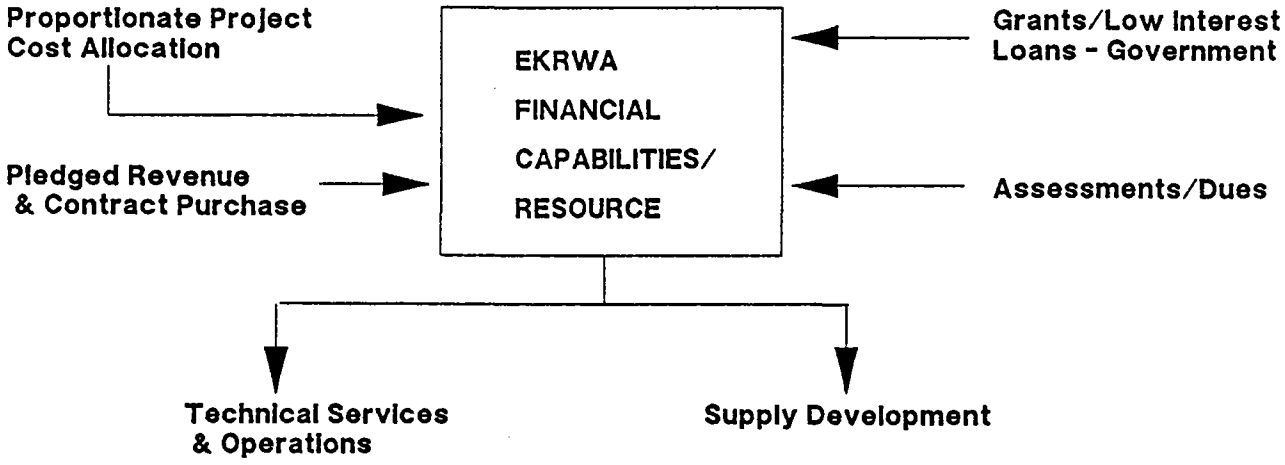


EXHIBIT X-3

SOURCE AND APPLICATION OF FUNDS FOR REGIONAL SUPPLY SYSTEM

		EKRWA	Seattle	Regional
Operation and Maintenance				X
Renewal and Replacement		X%	X%	
System Upgrade/Regulatory				X
System Expansion	- Internal	Eqv. Meter	Eqv. Meter	
	- Regional	Eqv. Meter	Eqv. Meter	

Note: The old water/new water rate concept would continue for non-EKRWA members and for the capital cost not financed by the system development charge. An alternative to this approach would be to continue with the existing shared financing program through the purveyor contract.

SECTION XI

SECTION XI

PLAN IMPLEMENTATION

1. INTRODUCTION

The Coordinated Water System Plan (CWSP) was prepared to implement the various provisions of the Public Water System Coordination Act, Chapter 70.116 RCW. This Section briefly outlines the approval process for the CWSP, the process for appealing CWSP procedures, how the CWSP is routinely updated, and provides the environmental review.

2. PLAN APPROVAL PROCESS

As outlined in Section II, the completed CWSP is presented in two parts: the Supplemental Provisions detailed in this document, and a compilation of individual Comprehensive Water Plans to be approved by King County and the Department of Social and Health Services (DSHS). Completed plans are on file with DSHS and the County. It is the responsibility of each utility to fulfill its water system planning requirements. The level of effort required is based upon the system size, the expansion plans of the utility, and the type of system ownership. Guidelines for preparing water system plans are available from DSHS. All individual Comprehensive Water Plans are to be submitted for review within 1 year from the date of CWSP completion; i.e., the date the CWSP is submitted to the King County Legislative Authority for review.

Preparation of the Supplemental Provisions is the responsibility of the County and the local utilities, acting through the Water Utility Coordinating Committee (WUCC). The WUCC identified local needs and gave direction to the development of the CWSP as it related to area-wide issues. Through the efforts of the WUCC and the County agency staff, the procedures, regional policies, and minimum standards have been completed for the Critical Water Supply Service Area (CWSSA).

The completed CWSP is submitted in sequence to the King County Utility Technical Review Committee; County Council's Parks, Planning, and Resources Committee; and, finally, the County Council. Each group reviews the document to ensure there are no inconsistencies with current land use plans, shoreline master programs, and/or developmental policies. The Council has 60 days upon receipt of the CWSP to act on the document. The alternative actions the Council may take are set forth in WAC 248-56-800 (See Exhibit XI-1). After Council action, the CWSP is submitted to DSHS, which must also act upon adoption within 60 days.

Any changes requested to procedures, service area boundaries, or other issues prior to the 5-year update of the CWSP need to follow the same process for amendment as that outlined above for CWSP approval.

3. APPEALS PROCESS

It may be expected that issues of protest or interpretation regarding requirements of the CWSP will be raised by either an applicant or a utility. An appeals process has been developed for the purpose of reviewing and resolving such issues. The Building and Land Development Division (BALD) will coordinate a two-step appeal process, as described below and shown on Exhibit XI-2.

A. Issues Subject to Appeal and Review - Only water service related issues are subject to appeal and review under this process. In most instances such issues will be identified when the applicant requests the Certificate of Water Service Availability from the water utility. Issues subject to review include, but are not necessarily limited to, the following:

(1) Interpretation and application of water utility service area boundaries.

(2) Proposed schedule for providing service.

(3) Conditions of service, excluding published rates and fees.

(4) Annexation provisions imposed as a condition of service; provided, however, existing authorities of City government are not altered by the CWSP, except where an interlocal agreement exists between a city and the County or as are specifically authorized by Chapter 70.116 RCW.

(5) Established minimum design standards under the conditions specified in Section IV.

B. Step 1 Review - If the applicant and utility are unable to agree on conditions of service, a written request may be made to the BALD by either party for review of the issues.

BALD will initiate this review by sending a copy of the request to the East King County Regional Water Association (EKRWA)/WUCC and providing an opportunity for resolution of the issues by the Association/Committee. At the same time the BALD will notify the Utility Technical Review Committee (UTRC) of the request for review for filing purposes.

The EKRWA/WUCC will establish a process for review which achieves the following objectives:

(1) Provides a forum for negotiation of the issues between the parties.

(2) Facilitates the negotiations.

(3) Where parties choose not to participate in the negotiations, identifies and evaluates the facts associated with the issues.

(4) Within 45 days of receipt of the request for review, provides a written report to the BALD which states the conditions of the agreement reached by the parties, or where no agreement was reached, a statement of findings and recommendations for disposition of the issues.

C. Step 2 Review - After the required waiting period or upon receipt of a report of findings and recommendations regarding unresolved appeals from the EKRWA/WUCC, the BALD will coordinate further review of the appeal with the King County UTRC. The UTRC is empowered under Chapter 13.24 King County Code to "...review and make recommendations to the King County executive and to the King County Council on the adequacy of all sewer and water comprehensive plans and related matters, and determination of their consistency with the King County Comprehensive Plan; provided, further, that the committee shall have the authority to approve additions and betterments to Council-approved sewer and water comprehensive plans without referral to the Council in order to serve developments which have received preliminary approval from the King County Council."

A legal determination should be made as to whether amendment of the UTRC authority is required to include review of appeals coordinated by the BALD.

Within 45 days of receipt of the report of the EKRWA/WUCC, the UTRC shall render its decision on the appeal. The findings and recommendations of the EKRWA/WUCC will be fully considered in arriving at this decision. The decision of the UTRC shall be binding on all parties, subject to any further appeal rights granted by County ordinance or State statute.

D. Binding Arbitration - At any point in the two-step process, the parties may mutually agree to submit to binding arbitration. The process and time schedule to be followed will be stipulated through written agreement. When such agreement is reached, the appeal will be removed from

the process described herein, resolved through binding arbitration, and the results be reported to the BALD.

4. RECOMMENDED DATABASE MANAGEMENT SYSTEM

A. Introduction

CWSPs are concurrently being developed by the EKRWA and South King County Regional Water Association (SKRWA). In addition, the SKRWA and the Seattle-King County Health Department (SKCHD) , as co-lead agencies, are preparing a Ground Water Management Plan (GWMP) and participating in a U.S. Geological Survey (USGS) study. King County, in cooperation with Ecology, is preparing GWMPs for the Issaquah Creek Valley and the Redmond-Bear Creek areas and proposes to initiate in 1990 a larger GWMP within the East King County CWSSA. Considerable groundwater information and water utility data is, or will become, available through these studies. However, there is currently no unified program for developing a common utility planning database for storage and use of this and similar information.

For these reasons, it is proposed that the EKRWA, in cooperation with the SKRWA, establish a Database Management System that will combine existing and future collected data into a single computer database. This System will initially focus on King County groundwater and utility planning data. Central to this program will be a Utility Data Management Center (Center) operated by the EKRWA. A joint operating agreement will define responsibilities between the two RWAs. Interagency agreements will be necessary for data transfers between the Center and government agencies (e.g., USGS, EPA, Ecology, King County). User agreements will also be required to establish the conditions and fees for use of the Center by RWA members and others. Exhibit IX-3 is a flow chart depicting this overall program.

It is anticipated that a more limited database program will be maintained by the SKCHD for Class 2, 3, and 4 water systems and related regulatory information. This program, as designed for SKCHD use as a part of the South King County GWMP, is compatible with the System recommended herein and data may be readily exchanged.

B. Database Management System

The recommended System is designed to provide user access to the information in an economic and efficient manner. The System consists of three basic components: the Center, the protocol, and the database.

(1) The Center

The Center is the facility from which the System operates; consisting basically of hardware and software. Recommended hardware are: an IBM-compatible personal computer with 2 to 4 MB of RAM and 80386/7 CPU, a hard disk drive of at least 6 MB capacity, a 36-inch by 48-inch digitizer, a printer, and a plotter. Recommended software are dBASE III+ (relational database software) and AutoCAD (vector mapping software). The facility requires a system administrator/supervisor to oversee data building and retrieval activities and to continue any ongoing developments.

Informational database procedures have been developed with dBASE to allow a user to make selections and to key in data using menus. Consequently, the user does not need to have a programming background to use the system. The procedures serve five basic functions as follows:

- Data input procedures are designed to prompt the user for required data fields and to do limited error checking to confirm the data was properly entered.

- Data editing procedures allow the user to modify or update existing information that is already contained in the database.

- Data retrieval routines allow the user to prepare data reports for use in water-resource planning studies. Standardized report forms can be used (e.g., water levels, pumpage, etc.). Data retrieval can be accommodated by the following:

  - Retrieve by Site ID,
  - Retrieve by an Owner ID (e.g., DSHS number),
  - Retrieve by Township-Range-Section, and
  - Retrieve by Latitude-Longitude or State Plane Coordinate windows.

- Data transfer routine allows the user to periodically extract all new or modified data and automatically build appropriately structured files for transfer to Ecology.

- Data backup routine allows the user to periodically save the contents of the entire System to a set of floppy disks.

Geographical database procedures have been developed using the AutoCAD software. The AutoCAD mapping is based on the Washington State Plane Coordinate System, Lambert Projection (north zone). This automated mapping system provides a convenient medium for manipulation and presentation of the data for public forums and reports and facilitates future updating of maps as new information becomes available.

Additional software has been developed to allow the user to query the data in dBASE and plot the results in AutoCAD. Conversely, the user could "highlight" areas in an AutoCAD map and extract dBASE information for the entities residing in the highlighted areas.

(2) Protocol

Like any tool, the Center is most effective when used in a standard way. This standard should be explicitly defined in the System User Protocol. This protocol describes the data format within the database, system management procedures, and system use procedures. The resulting standard data formats and data conversions allow easy interface with major federal databases such as STORET and WATSTORE, as well as state-wide databases maintained within Ecology (Ground Water Management Program) and the Department of Natural Resources (ARC-INFO). Also, the same Protocol is being/has been adopted by other counties such as Pierce County (Utility Data Management Center), Kitsap County (Ground Water Management System), and South King County (Ground Water Management System).

Using the System User Protocol, therefore, provides the Data Management System a "roadmap" for maintaining database system integrity as well as allowing for easy data exchange with Protocol users of different systems.

(3) Database

Water resource information contained within the USGS WATSTORE computer system may be downloaded and transferred to the personal computer system. The USGS database contains site, construction, water level, and well yield data. Additional sites from consultant reports, purveyor files, and other sources can also be entered into the database as well as owner and water rights information.

EPA's STORET data, like the USGS data, may also be downloaded from a mainframe database system into dBASE.

The reliability of the data contained within these databases is highly variable. The data associated with sites field-checked by the USGS are considered to be fairly reliable. However, data for many of the other sites may not be comparable. Well elevation data and site locations are probably the most problematic parameters. Future database management efforts should include field verification of well information and the establishment of a uniform site identification code to be used by all databases.

C. User Agreements

It is recommended that all users of the Database Management Center sign a User Agreement. The User Agreement establishes the following:

(1) Obtained information is public and will not be used for commercial purposes.

(2) AutoCAD APWA protocol will be followed.

(3) A user fee with a one-half hour minimum fee.

(4) Quality control is the responsibility of the user.

(5) User priority schedules.

(6) The Data Management Center is not liable or responsible for data accuracy.

An example of a User Agreement is Exhibit XI-4.

5. STATE AND COUNTY LEGISLATIVE ACTION

Implementation of this Plan will require enabling legislative action at both the State and County level. Program areas where new or amended laws, regulations, and/or ordinances may be necessary are as follows:

A. State Authority

(1) The concept of Satellite System Management Agency (SSMA) is not directly addressed in the Public Water System Coordination Act. The program described in Section VI includes a recommendation that DSHS establish, through regulations, a State-wide

procedure for certification of SSMAs. It is the intent of DSHS to first examine whether legislation is required and, if so, to submit a proposal to the 1990 State Legislature.

(2) As a companion measure to the above, the WUCC recommended that structured financial criteria be developed for SSMAs. DSHS will also examine this subject in its legal review of required statutory authority with a view to 1990 legislation.

B. County Authority

(1) Adoption of an ordinance for implementation of the Water Utility Design Standards described in Section IV.

(2) Amendment of the existing King County Code (KCC) regarding standards for approval of water comprehensive plans.

(3) Review of KCC, and appropriate action thereafter, with respect to the authority of the UTRC to process appeals as described in Section XI.

(4) Amendment of KCC as may be necessary to achieve recognition of those service area boundaries supported by signed Agreements, in Boundary Review Board and County franchise activities.

(5) Adopt procedures, by ordinance or other appropriate means, that require a signed Service Area Agreement as a prerequisite to granting approval to a utility for service area expansion.

(6) Following DSHS determination of the elements of a State-wide SSMA program, adopt an appropriate ordinance for County implementation.

6. COORDINATED WATER SYSTEM PLAN UPDATE

In accordance with the provisions of the Public Water System Coordination Act, the CWSP must be reviewed and updated by the WUCC every 5 years, or sooner, if necessary. An extension of 1 year from the date the Plan is submitted to the King County Legislative Authority for review, was given by the County and DSHS for the submittal of individual water system plans during the preparation of this CWSP. However, it is recommended that all individual water system plans included within the next CWSP update be submitted for review and approval at the same time as the CWSP. A uniform approval date will allow the Regional Supplement for the CWSP and the individual water system plans to be updated on the same schedule, ensuring the use of current information among all the utilities.

7. PERIODIC COMMITTEE REVIEW

The WUCC should continue as a standing committee which should meet at least semi-annually to review issues of regional significance and to review implementation issues regarding the CWSP. The Steering Committee should meet at least annually to review the effectiveness of and any changes needed to the Minimum Design Standards.

8. ENVIRONMENTAL DOCUMENT

The State Environmental Policy Act of 1971, Chapter 43.21C RCW, requires that all water system plans prepared must be accompanied by an appropriate environmental document. An Environmental Checklist has been prepared for the East King County CWSP and its recommended activities. This Checklist is included as Exhibit XI-5.

The CWSP has been prepared to establish administrative, management, and policy procedures to respond to the needs of existing and future customers in East King County. It is intended to address regional concerns within the County which are not ordinarily included in each utility's water system plan. Examples of those regional issues are: potential shared facilities, regional sources of supply, procedures for reviewing and approving future water use activities, minimum design standards, designated water utility service areas, and water utility management policies.

The CWSP contents are referenced in the Checklist. It is anticipated that both negative and positive impacts will occur to earth, water, land use, population, public services, and utilities as a result of implementing the individual water system plans. The CWSP has been developed in accordance with the King County Comprehensive Plan, local community plans, and city land use documents to reflect local land use policies and requirements. Therefore, implementation of this Plan and the employment of sound engineering and construction practices during the implementation of each utility's water system plan will minimize any adverse impacts.

It is recommended that before the CWSP is submitted to DSHS, a final environmental determination be made by King County. This final determination should be attached or incorporated within the CWSP at the time it is submitted to the King County Council.

EXHIBIT XI-1

STATE REGULATION RELATING TO LOCAL REVIEW OF PLAN

WAC 248-56-800 COORDINATED WATER SYSTEM PLAN - LOCAL REVIEW. (1) Prior to submission of a coordinated water system plan to the department for approval, the plan shall be reviewed by the county legislative authority(ies) in the county(ies) in which the critical water supply service area is located. County review of the coordinated water system plan shall include at least one public hearing.

(2) If no comments have been received from the county legislative authority(ies) within 60 days of receipt of the coordinated water system plan, the department may consider the plan for approval.

(3) If within 60 days of receipt of the coordinated water system plan, the county legislative authority(ies) find any segment of the plan to be inconsistent with adopted land use plans, shorelines master programs, the following shall occur:

(a) The county legislative authority(ies) shall submit written description of their determination and justification supporting their determination prior to the end of the 60 day period to the department and all affected parties.

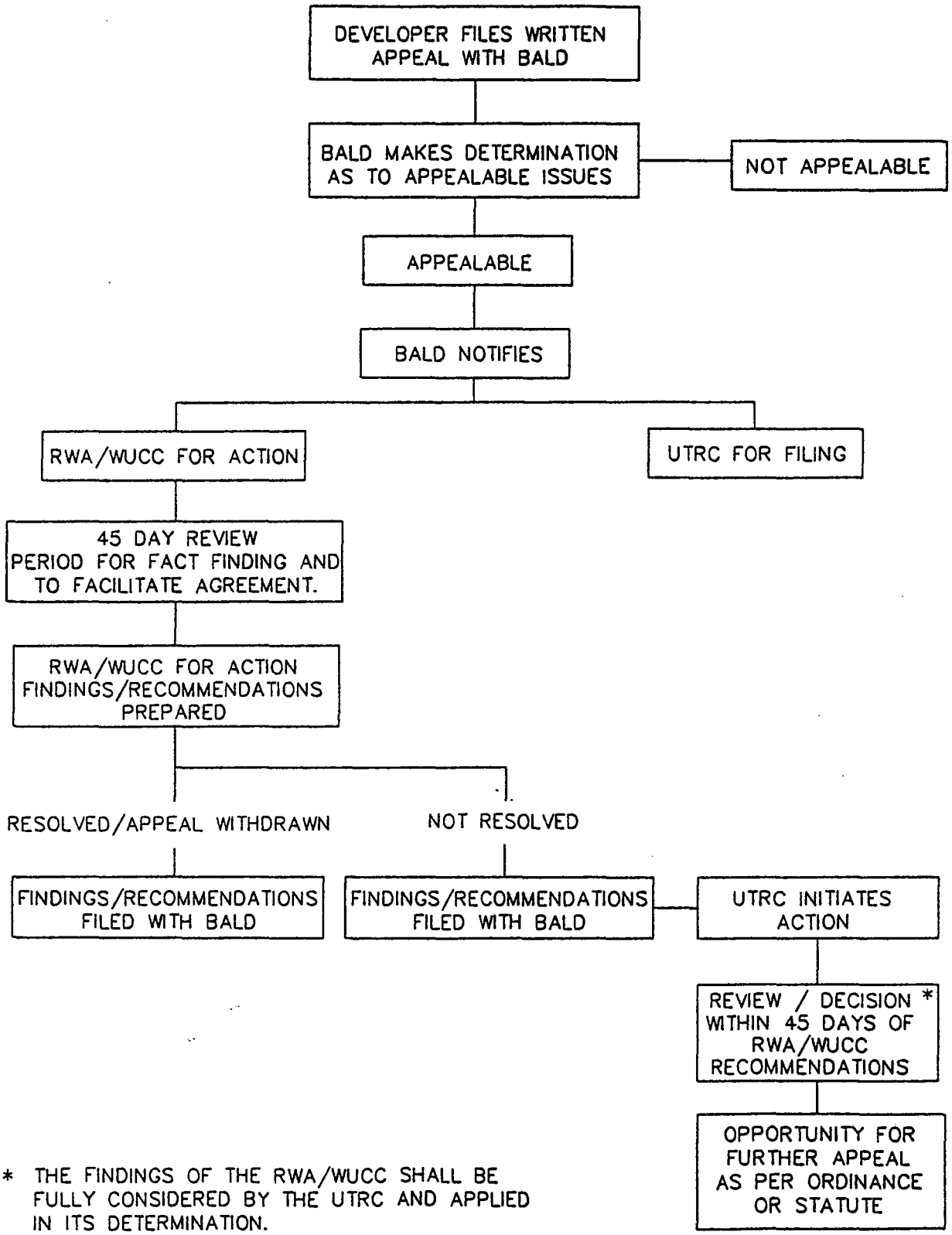
(b) The county legislative authority(ies) shall make every effort to resolve any inconsistencies within 60 days of submittal of written justification.

(c) the department may approval those portions of the coordinated water system plan found not to be inconsistent with adopted plans and policies at any time after the initial determination by the county legislative authority(ies).

(d) If after the 60-day period established for resolution of inconsistencies an inconsistency still exists, the affected parties shall each present their final recommended alternative solution to the department. The department shall then review all alternative solutions and discuss its recommendations with the county(ies) and the water utility coordinating committee. If after two years of the declaration of the critical water supply service area the inconsistencies persist, the department may deny proposals to establish or to expand any public water system facilities which affect that portion of the critical water supply service area being contested.

EXHIBIT XI-2

APPEAL PROCESS



* THE FINDINGS OF THE RWA/WUCC SHALL BE FULLY CONSIDERED BY THE UTRC AND APPLIED IN ITS DETERMINATION.

EXHIBIT XI-3
DATABASE MANAGEMENT SYSTEM

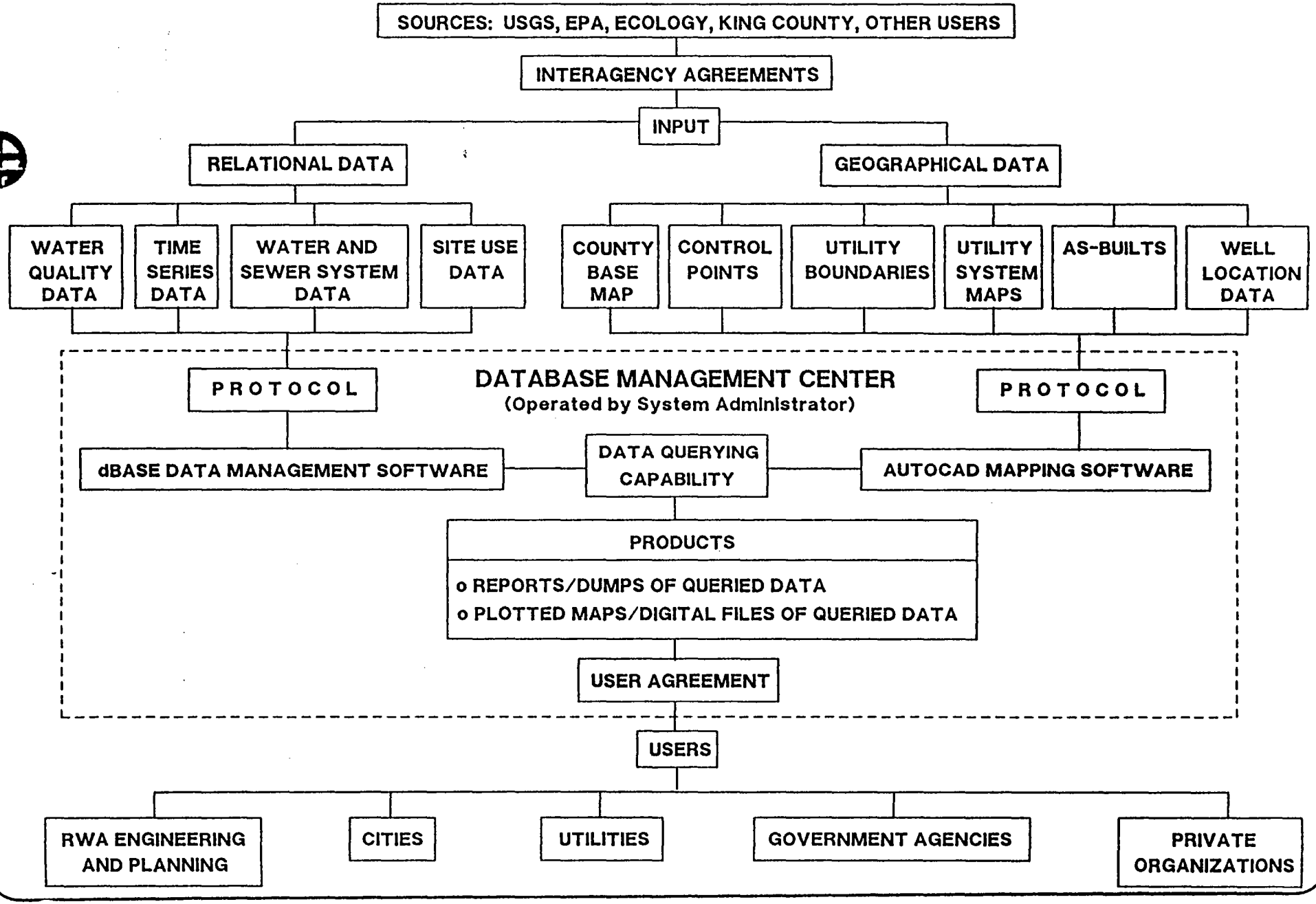


EXHIBIT XI-4

EAST KING & SOUTH KING COUNTY REGIONAL WATER ASSOCIATIONS

UTILITY DATA MANAGEMENT CENTER

USER AGREEMENT

IN CONSIDERATION of being permitted to use the joint East King County Regional Water Association/South King County Regional Water Association Utility Data Management Center ("Center"), the undersigned "User" agrees:

1. Charges. To pay the then current hourly charge for use of the Center as established by EKRWA and SKRWA, with a minimum one-half hour charge for any use.

The use time shall include time in receiving instruction or technical advice from Center personnel.

2. Scheduling. To make a reservation in advance of use of the Center. It is understood that priority in scheduling use of the Center is given to members of the sponsoring organizations, governmental bodies, and their authorized consultants.

3. Release. No warranty is made as to the reliability or accuracy of data and information obtained from the Center. User hereby releases the sponsoring organizations and their members from any and all claims or damages, including indirect or consequential damages, related to the accuracy or use of such data and information.

4. Data Use. All data and information in and provided by the Center is public information. User agrees that data or information obtained from the Center will not be sold or used for any commercial purpose without the Center's written permission.

DATED _____, 19___.

_____
Municipal or Company Name

By_____
Authorized Signature

Address: _____

_____

_____

Phone: _____

EXHIBIT XI-5
PART ELEVEN — FORMS

RCW 197-11-960 Environmental checklist.

ENVIRONMENTAL CHECKLIST

Purpose of Checklist:

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

Instructions for Applicants:

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply". Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Use of checklist for nonproject proposals:

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." IN ADDITION, complete the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D).

For nonproject actions, the references in the checklist to the words "project," "applicant," and "property or site" should be read as "proposal," "proposer," and "affected geographic area," respectively.

A. BACKGROUND

1. Name of proposed project, if applicable:

East King County Coordinated Water System Plan

2. Name of applicant: King County Parks, Planning and Resources Department

3. Address and phone number of applicant and contact person: Mr. Richard Rodriguez
Building and Land Development Office
3600 - 136th Place SE, Suite A
Bellevue, WA 98006 (206)296-6666

4. Date checklist prepared: August 15, 1989

5. Agency requesting checklist: Building and Land Development Division

6. Proposed timing or schedule (including phasing, if applicable):

Approval of plan in 1990; update every five years thereafter.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

Yes, participating water purveyors will update their respective comprehensive plans for consistency with this plan.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

None other than contained in Plan.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

Not applicable.

10. List any government approvals or permits that will be needed for your proposal, if known.

a) Review by King County Council for consistency with current land use plans, shoreline master programs and/or developmental policies.

b) Approval/adoption by State Department of Health.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

Not applicable.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

Study area delineated on location diagram attached hereto.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

B. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site (circle one): Flat, rolling, hilly, steep slopes, mountainous, other _____. Not applicable.

b. What is the steepest slope on the site (approximate percent slope)?

Not applicable.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Not applicable.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

Not applicable.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

Not applicable.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Not applicable.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Not applicable.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Not applicable.

2. Air

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Not applicable.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

Not applicable.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

Not applicable.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

3. Water

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Not applicable.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Not applicable.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

Not applicable.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

Not applicable.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

Not applicable.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

Not applicable.

b. Ground:

1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

Not applicable.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals . . .; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

Not applicable.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

c. Water Runoff (including storm water):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Not applicable.

2) Could waste materials enter ground or surface waters? If so, generally describe.

Not applicable.

d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

Not applicable.

4. Plants Not applicable.

a. Check or circle types of vegetation found on the site:
__ deciduous tree: alder, maple, aspen, other
__ evergreen tree: fir, cedar, pine, other
__ shrubs
__ grass
__ pasture
__ crop or grain
__ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
__ water plants: water lily, eelgrass, milfoil, other
__ other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Not applicable.

c. List threatened or endangered species known to be on or near the site.

Not applicable.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Not applicable.

5. Animals Not applicable.

a. Circle any birds and animals which have been observed on or near the site or are known to be on or near the site:

birds: hawk, heron, eagle, songbirds, other: .....
mammals: deer, bear, elk, beaver, other: .....
fish: bass, salmon, trout, herring, shellfish, other: .....

b. List any threatened or endangered species known to be on or near the site.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

c. Is the site part of a migration route? If so, explain.

Not applicable.

d. Proposed measures to preserve or enhance wildlife, if any:

Not applicable.

6. Energy and Natural Resources

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Not applicable.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

Not applicable.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:

Not applicable.

7. Environmental Health

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

Not applicable.

1) Describe special emergency services that might be required.

Not applicable.

2) Proposed measures to reduce or control environmental health hazards, if any:

Not applicable.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?

Not applicable.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.

Not applicable.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

3) Proposed measures to reduce or control noise impacts, if any:

Not applicable.

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties?

Multiple uses.

b. Has the site been used for agriculture? If so, describe.

Agricultural use generally exists in rural areas.

c. Describe any structures on the site.

All types.

d. Will any structures be demolished? If so, what?

Not as a part of the Plan.

e. What is the current zoning classification of the site?

Varies.

f. What is the current comprehensive plan designation of the site?

Varies.

g. If applicable, what is the current shoreline master program designation of the site?

Varies.

h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.

Not applicable.

i. Approximately how many people would reside or work in the completed project?

Not applicable.

j. Approximately how many people would the completed project displace?

Not applicable.

k. Proposed measures to avoid or reduce displacement impacts, if any:

Not applicable.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Plan must be consistent with existing zoning and land use plans.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.
Not applicable.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.
Not applicable.

c. Proposed measures to reduce or control housing impacts, if any:

Not applicable.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

Not applicable.

b. What views in the immediate vicinity would be altered or obstructed?

Not applicable.

c. Proposed measures to reduce or control aesthetic impacts, if any:

Not applicable.

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?
Not applicable.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

Not applicable.

c. What existing off-site sources of light or glare may affect your proposal?

Not applicable.

d. Proposed measures to reduce or control light and glare impacts, if any:

Not applicable.

12. Recreation

a. What designated and informal recreational opportunities are in the immediate vicinity?

Not applicable.

b. Would the proposed project displace any existing recreational uses? If so, describe.

Not applicable.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

Not applicable.

13. Historic and Cultural Preservation

a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site? If so, generally describe.

Not applicable.

b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.

Not applicable.

c. Proposed measures to reduce or control impacts, if any:

Not applicable.

14. Transportation

a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.

Not applicable.

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop? Not applicable.

c. How many parking spaces would the completed project have? How many would the project eliminate? Not applicable.

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

Not applicable.

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

Not applicable.

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur. Not applicable.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

g. Proposed measures to reduce or control transportation impacts, if any:

Not applicable.

15. Public Services

a. Would the project result in an increased need for public services (for example: fire protection, police protection, health care, schools, other)? If so, generally describe.

Not applicable.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Not applicable.

16. Utilities

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other. Not applicable.

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Not applicable.

C. SIGNATURE

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: .....

Date Submitted: October 2, 1989

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

D. SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS

(do not use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

The Plan responds to growth and related water demand. The Plan does not create the projected increase in population and attendant environmental impacts.

Proposed measures to avoid or reduce such increases are:

None - as a part of this Plan.

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

The Plan has no affect on these resources. Implementation of certain aspects of the Plan may have some affect, but such actions would be subject to individual environmental review.

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

None.

3. How would the proposal be likely to deplete energy or natural resources?

Same response as 2. above.

Proposed measures to protect or conserve energy and natural resources are:

The Plan proposes implementation of a water conservation program for municipal water use on a regional basis.

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

All elements of the Plan must be found to be consistent with local land use plans, policies and development programs to be approvable. Specific actions proposed for implementation under the Plan would be subject to environmental review.

Proposed measures to protect such resources or to avoid or reduce impacts are:

None.

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

Same response as 4. above.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

Proposed measures to avoid or reduce shoreline and land use impacts are:

None.

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

Plan will provide clarity concerning water service to specific areas, thereby supporting growth planned under existing zoning and land use plans.

Proposed measures to reduce or respond to such demand(s) are:

None necessary.

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

No conflict expected, since Plan and all development resulting therefrom must be approved by the appropriate local and state agencies.