

## **SECTION 1 INTRODUCTION**

### **1.1 INTRODUCTION**

Under Washington State Law (WAC 246-290), all Class 1 water systems (1,000 or more services) are required to update water system plans every six years. These plans are required to be submitted and approved by the Washington State Department of Health (DOH) and the King County agencies within which the District operates. This document represents Water District 19's (WD 19, the District) most recent comprehensive planning effort, updating and superseding its 2000 Plan. This plan compiles and summarizes the results and conclusions of planning and engineering studies undertaken by PACE Engineers Inc. and Water District 19 in developing an updated water system plan and capital facilities plan for the District.

The August 2001, Water System Design Manual and the April 1997, Water System Planning Handbook are both provided by DOH and represent the fundamental basis for this plan and recommendations for system reliability.

In accordance with the DOH and King County requirements, this document identifies the characteristics of the service area, describes the existing water system, establishes the minimum design criteria for system evaluation, identifies system deficiencies and presents a detailed capital facilities plan as well as an implementation program to accomplish the recommendations of the plan. The District's existing computerized hydraulic model was converted to more current water system modeling software, updated and used to evaluate the existing system and simulate alternatives for recommended system improvements. In accordance with DOH requirements the appendices contain water quality monitoring, cross connection control, watershed and wellhead protection, conservation program information and other supporting documentation.

### **1.2 SYSTEM OWNERSHIP AND MANAGEMENT**

Water District 19 is a public utility authorized under RCW Title 57 – Water and Sewer Districts. Governance of the District is conducted by a three member Board of Commissioners elected by the residents of WD 19. Water Service is provided to the eastern central portion of Vashon Island and a small area within the northwest section of Maury Island. Figure 1-1 presents a Vicinity Map outlining the general location of the water service area.

### **1.3 WATER SYSTEM POLICIES**

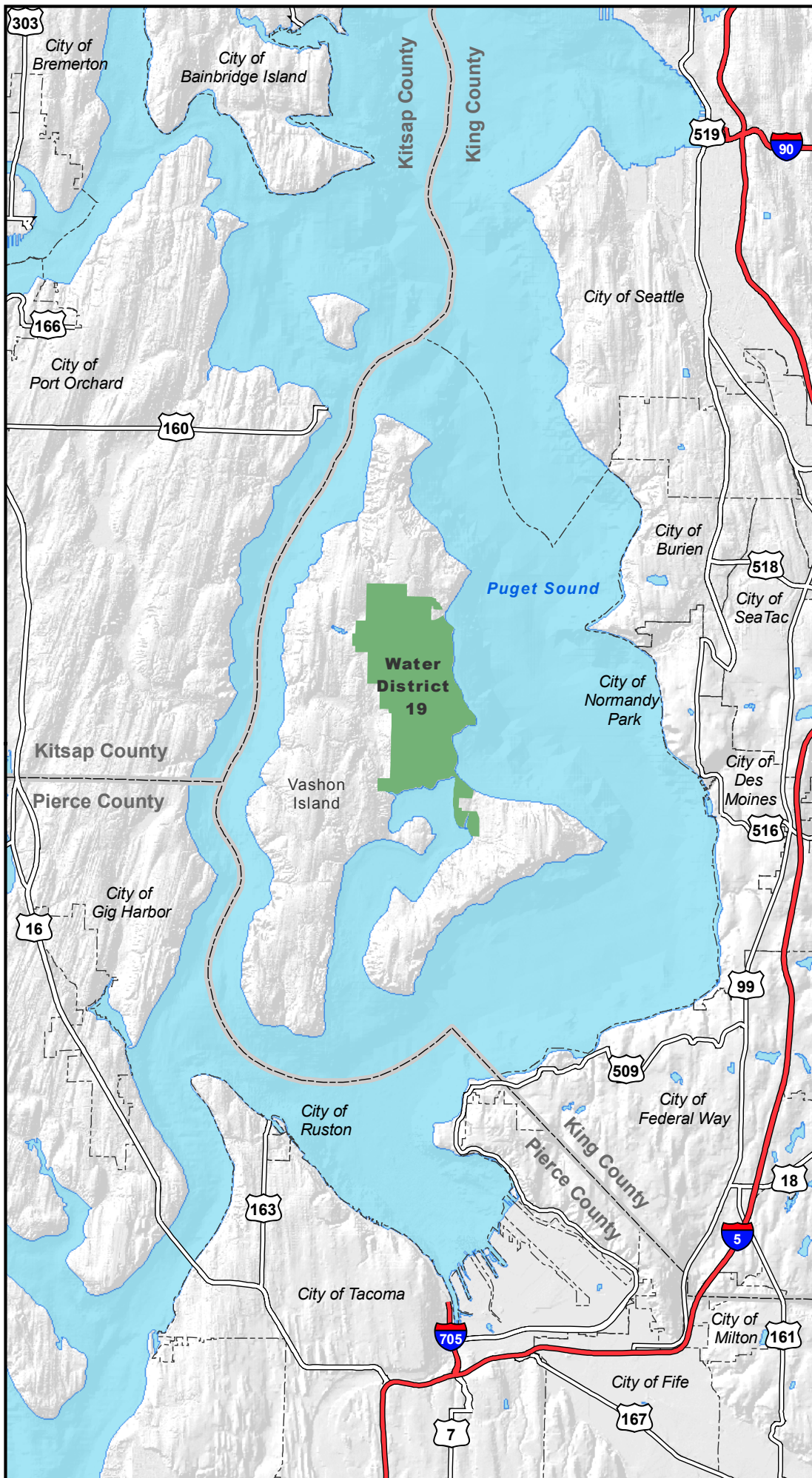
The following policies have been adopted by Water District 19 and supersede previous policies in the District's 2000 Water System Plan.

***General Policies:***

- G-1 The District's primary responsibility is to provide clean, safe drinking water to the people within our boundaries and to provide a well-maintained infrastructure with fire protection where feasible.
- G-2 The District will carry out its responsibilities to the best of its ability while adhering to all federal, state, county laws and regulations that apply to Public Water Systems.
- G-3 The District will continue to study all options and operating procedures in order to carry out its responsibilities in a cost effective, prudent and reasonable manner and will continue to try to reflect the needs of the community it serves.
- G-4 The District will place sufficient operating revenues in reserve so that future, predictable infrastructure replacement and repair do not unduly burden future customers with exorbitant rates or debt.
- G-5 The District encourages public input and provides the opportunity for public participation at each commissioner's meeting.
- G-6 The District will complete and update when necessary its Emergency Preparedness Plan, and will work with other local groups to coordinate community response in the event of a disaster.

***Water Supply Policies:***

- WS-1 The District will search for new sources of water if the opportunity and the funds are available. If more water becomes available, the authorization of new water connections will be carefully considered, giving the District the opportunity to assess the impacts and needs of the water system
- WS-2 If the District discovers there is sufficient water to enable it to use the Beall Greenhouse water right, the District will follow the provisions of the State Department of Ecology (DOE) Report of Examination and the settlement agreement with DOE/Protect Our Water.

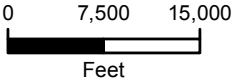


WATER DISTRICT  
**19**



**Legend**

- Water District 19 Service Area
- County Boundary
- City Boundary



**Figure 1-1**

**Vicinity  
Map**

**Water District 19  
2007  
Comprehensive  
Plan**

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- WS-3 The District will manage its water sources in a manner that ensures long-term sustainability. To that end, the District will continuously monitor withdrawals from wells, well drawdowns, withdrawals from streams, stream flows, and all system leakage and losses.
- WS-4 Water District 19 is the only publicly owned district water supply system and the largest on Vashon Island. There are no other sources on the Island that will likely be able to service the District in the event of prolonged drought situations. Therefore, the District has chosen to plan conservatively and to authorize new connections only if historical data indicate water is available.
- WS-5 The District will strive to manage its resources so that water restrictions are not necessary in the event of drought conditions
- WS-6 The District evaluates metered customer water usage to calculate per day peak use per residential service connection, or equivalent residential unit (ERU). This ERU, which will be re-evaluated periodically, is used to determine the number of service connections that can be served. Should new water rights be obtained, or usage decline significantly, the District's ERU and DOH recommendations shall be used to determine the number, if any, of new service connections that can be added.

***Waiting List Policies:***

- WL-1 Future service connections, should they be possible, will be distributed to customers on the waiting list on a first-in-time basis.
- WL-2 The District will continue to evaluate the reliability of its sources of supply, the demand placed upon those supplies (by both water production and stream flow) and authorize new service connections only if it is confident that a sufficient supply is available to meet both demands.

***Environmental Policies:***

- E-1 The District will steward the 104 acres of natural watershed area it currently owns using the best available science and advice to manage the surface water sources and the habitat within these watersheds.
- E-2 The District will address environmental impacts of projects in accordance with the State Environmental Policy Act and the requirements of all applicable local, state and federal law.

- E-3 The District will support island wide efforts to understand the nature and complexity of the Vashon Island water resources and the search for funding to implement such programs.
- E-4 The District will evaluate the demand of fisheries habitat and water supply on its water supply resources, and strive to maintain healthy stream flows both for resident fish and for their contribution to the near shore marine environment.

***Water Conservation Policies:***

- WC-1 The District will pursue water conservation as a primary goal, through educational outreach to its customers and through programs designed to directly reduce consumption.
- WC-2 The District will continue to vigorously pursue leak detection within its system.
- WC-3 The District's goal for the next 6 years is a reduction per ERU of consumption during summer months by an average of 2% (refer to conservation plan).

***Water Quality Policies:***

- WQ-1 The District regards providing good water quality as its highest priority and will actively seek continuous improvement in achieving water quality goals that meet and attempt to exceed all local, state and federal standards.
- WQ-2 Recognizing the vulnerability of the Vashon sole source aquifer, the District will seek to protect long-term water quality through educational and other efforts to minimize source water quality degradation.

***Water Service Policies:***

- WServ-1 All new connections to the system, and all material changes of use of existing connections, must be authorized by the District Board of Commissioners. Authorization will be accomplished with the issuance a Certificate of Water Availability (CWA) that specifies the King County parcel number, the number of water service units, and the intended use of the connection.
- WServ-2 every commercial structure that uses water from the District must have at least one water meter and at least one water service unit.
- WServ-3 When the District grants a Certificate of Water Availability (CWA) to one of its existing water service unit holders, the District is agreeing to provide water for the

use specified by the applicant at the time of the application. The District is neither allocating nor entitling a specific amount of water, nor is the District restricting the applicant to a specific amount of water. If, subsequent to the granting of a CWA, the water service unit holder wishes to fundamentally change or add a new use of water to the holder's original request, the holder must re-apply for a new CWA from the District to approve the change or new use.

W-Serv-4 Customers with existing, paid-up water service units, which are assigned to specific parcels, will normally be issued CWA's when applying for King County building and development permits, if these permits do not call for a fundamental change or significant expansion of water use on the parcel. However, a CWA will be provided only if all applicable District policies and conditions are met, and no changes to land use or zoning are involved.

***Service Area Policies:***

- SA-1 Wholesale Customers: The District currently does not have any wholesale customers and will address this issue on a case-by-case basis.
- SA-2 Wheeling of Water: The District does not currently wheel water to another system. The District will evaluate this on a case-by-case basis. Any entity wishing to wheel water through the District's system will need to meet certain conditions pertaining to water quality, system engineering etc.
- SA-3 Annexation: The District will address any request from a person/group that petitions the District for annexation.
- SA-4 Direct Connection and Remote Systems: The District requires direct connection to the system if the District has the capacity to do so. If not, refer to the District's 1999 Satellite Management Agency Plan.
- SA-5 Design and Performance Standards: The District has published Developer Standards for the Construction of Water Systems within the District.
- SA-6 Surcharge for Outside Customers: The District does not provide water service outside of its service area boundaries
- SA-7 Latecomer Agreements: The District will address latecomer agreements which will allow persons/groups to recover costs used towards the construction of waterline construction on a case-by-case basis.

- SA-8 Oversizing Policy: The District may reimburse developers for oversizing water main extensions if the District requires the developer to install water mains larger than eight-inches.
- SA-9 Cross Connection Control Program: The District requires existing or potential cross-connection hazards to have a proper backflow prevention device installed, tested and annually inspected.
- SA-10 Extension Policy: The District requires water main extension pipe to be no less than eight-inch ductile iron pipe.
- SA-11 Requests for new service connections are processed in the order received. If water is available, an Application for Water Service is executed between the District and the property owner.
- SA-12 Every six years prior to initiating the revision of the Comprehensive Water System Plan, the District will complete a System Capacity and Analysis Study to determine system capacity.
- SA-13 Conditions of a non-technical nature that directly impact the District's ability to provide new water service include the limited water resources available from the Island sole source aquifer, the adherence to applicable laws and regulations governing the administration and operation of the water system, the conformance to the recommendations of the state Department of Health, Department of Ecology and King County, the nature of the District's service area, the limited water rights of the District and the lack of affordability of implementing improvements and perfecting new sources.
- SA-14 Requests for project / installation extensions will be reviewed by the District staff. A recommendation will be forwarded to the Board of Commissioners and a decision rendered at a regular public meeting. Any disputes or appeals must be brought before the Board at the next regular public meeting. A file will be established to document each case.

## **1.4 SYSTEM BACKGROUND**

### ***1.4.1 HISTORY OF THE DISTRICT***

Water District 19 is the only public water district on Vashon Island. The District was established by special election in 1925. At that time the service area consisted of one square mile of land within the unincorporated Town of Vashon. Today the service area encompasses approximately 6.2 square miles.

The original distribution system consisted of about 2 miles of dipped and wrapped wrought iron pipe. Storage consisted of a 20,000 gallon elevated wood tank. This tank was replaced in 1945 of similar material and was utilized until 1965. In 1958 an additional 100,000 gallon tank was constructed at SW 216<sup>th</sup> Street and 99<sup>th</sup> Avenue SW. In 1970, a 625,000 gallon reservoir was constructed at SW 188<sup>th</sup> Street and 103<sup>rd</sup> Avenue SW and then in 1988 a 1,000,000 gallon reservoir was also constructed at this site.

The original source of supply consisted of two 4-inch dams just to the north of the mouth of Beall Creek. A pump house replaced these dams when they were washed out in 1936. The pump house was used in conjunction with Water Treatment Plant No.1 but is no longer in use.

In 1969, Island Mutual Water Company was annexed into the District. This included the acquisition of Water Treatment Plant No. 2. The source was a developed spring that included a concrete inlet structure and a pump house with two pumps, a chlorinator and clear well.

In 1995, a new water treatment plant was constructed to replace Water Treatment Plants No. 1 & 2. Both sites were converted into raw water pump stations.

Well No. 1 was developed in 1979 and had a predicted original capacity of 250 gallons per minute (gpm), which has decreased to 100 gpm. Well No. 2 was developed in 1990 as a replacement for Well No.1, and after repeated efforts at re-development, its capacity has decreased to 50 gpm. Well No.4 was developed in 2005 as a replacement for the lost capacity in Well No.2 and was predicted to have an initial capacity of 250 gpm, but within six months, that capacity decreased to 100 gpm. Currently, based on historical operations data, the District limits the well field production to a total of 150 gpm in order to protect the wells from excessive drawdowns and costly redevelopment.

## **1.5 RULES AND REGULATIONS**

As a public water system, Water District 19 operates under the authority and in accordance with a variety of regulations pertaining to production and delivery of safe drinking water for the purpose of public consumption and fire protection. A brief summary of the primary rules and regulations affecting the operation of water utilities is presented below.

### **1.5.1. FEDERAL REGULATIONS**

#### 1.5.1.1 SAFE DRINKING WATER ACT

Public Law 93-523, the Safe Drinking Water Act (SDWA) of 1974 and amended in 1986 and 1996, directs the United States Environmental Protection Agency (EPA) to establish minimum national drinking water standards which limit the amount of substances which are sometimes found in drinking water sources. Water District 19 maintains a water quality monitoring program which is in accordance with the current federal drinking water standards as governed by the State of Washington Department of Health.

#### 1.5.1.2 CLEAN WATER ACT

The Clean Water Act of 1977, revised in 1981 and 1987, puts forth regulations for restoration and maintenance of the integrity of the nation's water in terms of physical, chemical and biological characteristics. The EPA is the primary administrator of the Clean Water Act.

### 1.5.1.3 ENDANGERED SPECIES ACT

Due to the listing of the Puget Sound Chinook Salmon and Bull Trout as “threatened species”, rules and regulations under the authority of the Endangered Species Act (ESA) of 1973 impacts the District’s system operations. The District complies with all permit requirements associated with construction of its new utility systems and is researching and plans to implement the most current techniques in system operation and maintenance to reduce the threat of impacting endangered species.

## **1.5.2 STATE OF WASHINGTON REQUIREMENTS**

### 1.5.2.1 WASHINGTON ADMINISTRATIVE CODE & REVISED CODE OF WASHINGTON

The rules and regulations governing the operation of public water systems are a part of the Washington Administrative Code (WAC) and were adopted pursuant to the provisions of Revised Code of Washington (RCW) 43.20.050 for the protection of public health was enacted in 1965. The rules and regulations provide the minimum standards of design, construction, operations and maintenance of public water systems and conform with the Safe Drinking Water Act of 1974 and all amendments thereto.

RCW Title 57 governs the operation of Water and Sewer Districts within the State of Washington and provides the authority for Water District 19 to operate a public water system. Title 57 dictates a variety of planning and operational characteristics such as establishment of boundaries, annexations, consolidations, mergers, formation of utility local improvement districts, comprehensive planning requirements, officer elections, contracts and system extensions.

### 1.5.2.2 GROWTH MANAGEMENT ACT

The Growth Management Act of 1990 (RCW 36.70A) has a direct impact on utility system planning by requiring a complete inventory of existing utility system facilities and a comprehensive effort toward determining the capacity of utility systems to support anticipated growth. Although the majority of growth management activities are the responsibility of counties and cities, data and information from special purpose districts is required in order to make decisions on future growth potential and corresponding levels of service. A primary outcome of the growth management planning in King County is the delineation of an Urban Growth Area (UGA)

boundary, within which an urban level of service is required. Water District 19 is located outside of the UGA boundary currently defined by King County. In addition, the current (September 2004) King County Comprehensive Plan states that the current Urban Growth Area delineated in 1994 continues to be appropriately sized to accommodate growth expected through the year 2022 and that no significant change is necessary.

#### 1.5.2.3 MUNICIPAL WATER LAW

Municipal Water Supply-Efficiency Requirements Act of 2003 (House Bill 1338) is currently being implemented. The goals of the law are to provide greater flexibility and certainty to water rights held by purveyors, provide a closer tie between DOH approvals for water system plans and engineering with the water rights administered by Department of Ecology (DOE), improve the ability to plan for future growth, to advance water use efficiency and to assure greater reliability of safe drinking water to communities. The “Duty to Serve” section of the law states the retail service area is the area in which water is or will be sold directly to consumers. Designation of a retail service area occurs when a municipal water purveyor receives Department of Health approval of their water system plan. Municipal Water Law requirements are addressed through increased coordination with land use agencies and documentation of service procedures and water use. These new requirements are recognized throughout the plan and appendices.

#### 1.5.2.4 DEPARTMENT OF HEALTH

Approval of this document and operation of the District’s water system is under the jurisdiction of the Washington State Department of Health (DOH). This document has been prepared, and the District is operated, in accordance with the requirements set forth in the DOH “Water System Design Manual” (August 2001). This document incorporates the policies, guidelines, and practices of the Department of Health and identifies minimum engineering requirements for design, construction, and operation of a public water system. The District must also meet all DOH regulations for drinking water, including those documented in WAC 246-290.

#### 1.5.2.5 PUBLIC WATER SYSTEM COORDINATION ACT

The Public Water Supply Coordination Act of 1977 (RCW 70.116) establishes procedures for adjacent water utilities and local government

agencies to coordinate the planning and development of water facilities. These procedures are intended as guidelines for providing future water service in the most efficient manner with the objective of coordinating water system development by geographical areas and integrating water system development with future land use plans. Water District 19 is within the Vashon Coordinated Water System Plan area and subject to the terms and conditions of that plan.

### **1.5.3 KING COUNTY REQUIREMENTS**

The District's entire service area is located within unincorporated King County, and must operate within the rules and regulations established by King County. All work done within King County road right-of-way will be done in accordance with the most current edition of the King County Road Standards (2008).

The District must utilize County planning data in developing growth projections. Specifically, the King County Comprehensive Plan has a direct impact on the District and its planning efforts. King County Code Chapters 13.24 (Sewer and Water Comprehensive Plans enacted in 1980) and 17.08 (enacted in 1983) have been utilized in the development of this document to insure that District operations are in conformance with King County requirements.

## **1.6 RELATED PLANNING DOCUMENTS**

The following documents were consulted in the preparation of the 2007 Comprehensive Water System Plan.

Vashon-Maury Island Watershed Plan – Draft June 1, 2005

Vashon-Maury Island 2005 Water Resources Data Report – April 2006

Vashon-Maury Island 2005 Well Data Report – September 2006

Vashon-Maury Island Phase 1 Groundwater Model – October 2005

Low Impact Development – Technical Guidance Manual for Puget Sound – January 2005

Vashon-Maury Island Ground Water Advisory Committee, Vashon-Maury Island Ground Water Management Plan, December, 1998

This document, prepared over the past ten years, contains a statement of purpose, recommended ground water management strategies, and a recommended implementation process. The plan contains an extensive set of recommendations,

along with prioritization and funding discussions. The plan states “the Vashon Ground Water Advisory Committee decided at the outset that its goal is: to manage the ground water resources of King County to optimize current and long-term benefits for present and future residents. To achieve that goal we ask King County to: **adopt a non-degradation policy for Vashon.**”

The “high” priority management strategies include, but are not limited to, the following:

- Applying land use controls to prevent overuse or contamination.
- Incorporating an assessment of water quality impacts from specific land uses.
- Implementing a seawater intrusion program.
- Monitoring trigger levels of certain parameters to help in assessing land use impacts on ground water.
- Assessing development’s potential impact to recharge areas or infiltration potential on ground water.
- Requesting King County to enforce and implement adopted resource and land use policies applicable to Vashon-Maury Island.

The plan outlines an implementation strategy, which requires significant resources from several County agencies, the Seattle-King County Health District, utility providers, and other state agencies. As described in the plan, funding would come from a combination of sources, including County agency funds and creation of an Aquifer Protection Area, to be approved by ballot, which would authorize the collection of monthly ground water and septic system user fees.

As part of the recommended management strategies, water purveyors would participate in a program to monitor water quality, water level, precipitation and stream discharge parameters (high priority), update water right records (low priority), and should investigate artificial recharge (also assigned a low priority).

The plan summarizes the potential for seawater intrusion as follows:

Water quality on Vashon-Maury Island is also threatened by seawater intrusion occurring along the coast. When groundwater is pumped from aquifers that are in hydraulic continuity with Puget Sound, seawater may flow toward the well resulting in elevated levels of chloride. Wells with elevated chloride levels were identified in 1983 on the northern end of Vashon Island and the southeastern section of Maury Island. Wells monitored along the coastline in 1989 and 1990 as part of this Plan

showed no evidence of seawater intrusion. However, a well with seawater intrusion in the northeast area (near Glen Acres) of Vashon was closed in 1993.

It is the District's understanding that County funding commitments are not forthcoming and that implementation of this plan is not imminent. This document also contains conclusions which differ from previously reported data concerning seawater intrusion.

King County, Vashon Town Plan, July, 1996.

This Plan was completed to reflect the current desires of Islanders to protect the area's character and structure, and to guide future development in directions consistent with this character. This Plan looks at circulation within the Town, parks and open space, urban design, historic preservation, residential development, and implementation. An Existing Conditions Report is included in the appendix to document existing physical and regulatory conditions within the Vashon Town Planning Area, to provide design guidelines, development/implementation strategies, and policies. The Existing Conditions Report discusses existing land uses, sensitive areas, circulation/transportation, utilities, regulatory conditions, and the King County Zoning Ordinance. It also provides a susceptibility to change analysis, problems and opportunities, and Vashon Island/King County Demographics.

Carr/Associates, Water Supply Development Alternatives Phase I Report, October, 1988.

This document discusses the existing sources at Beall and Ellis Creeks. It provides information about the surficial hydrogeology, the electrical resistivity, and local well information. The study is providing future recommendations for the status of the documented water sources.

Gray & Osborne, INC., King County Water District No. 19 Water Treatment Plant Operation and Maintenance Manual, April, 1996.

This document was developed specifically for the District Treatment Plant. The manual provides instructions for operating and maintaining the components within the water treatment system. It includes physical and functional descriptions of the components within the water treatment system as well as operation and troubleshooting procedures with suggested corrections.

Geraghty & Miller, INC., Vashon Groundwater Management Plant Updated Area Characterization and Data Analysis, June 7, 1993.

This report was completed to provide an updated characterization of the Vashon-Maury Island Groundwater Management Area for the Vashon-Maury Island Groundwater Management Plan. The report also summarizes the results of groundwater and surface water data collection and analysis activities between 1989 and 1992 conducted as a part of the Vashon Groundwater Management Plan. Results of this study include, but are not limited to, the following:

- Annual rainfall for the Island may range from approximately 23 to 62 inches per year.
- High fecal coliform levels appear throughout the stream system, although the quality of spring water on the Island appears to be good.
- The water-bearing zones monitored by the selected wells generally showed a stable or a slight rise in the water level during this study and, therefore, do not appear to have been affected by groundwater withdrawals.
- The concentration levels of chloride, nitrate, and TDS do not suggest any impact from land use.
- Seawater does not appear to be intruding on the Island's freshwater sources.
- Based on the 25 wells monitored as part of the study, this data conflicts with the December 1998 Groundwater Management Plan, which concluded that seawater intrusion did threaten the groundwater along the coast.

Gray & Osborne, INC., King County Water District No. 19 Water Treatment Plant Addendum to 1992 Engineering Report, July, 1994.

This report was completed as a supplement to the 1992 Engineering Report, which was approved by the Department of Health, to summarize and expand upon previous information. This report identifies the new treatment plant to be a package plant employing an absorption clarifier concept, utilizing two 350 gpm units. A 2300 square foot building was identified to house the package filter plant and backwash and finished water pumps, an electrical room, and a laboratory. This report also discusses planning and water resources, design criteria, and a description of the proposed system.

Gray & Osborne, INC., King County Water District No. 19 Water Treatment Plant Engineering Report, June, 1992.

This predesign report for new surface water treatment facilities was developed in conjunction with the District's 1992 Water System Plan Update to explore different

alternatives for meeting the future supply requirements, establish costs for specific alternatives, and recommend a preferred surface water treatment alternative. This report looked at alternatives for surface water treatment, including conventional treatment (flocculation, sedimentation, and filtration), direct filtration, conventional package plants, adsorption clarifier package plants, tube-type clarification package plants, and slow sand filtration. The recommended alternative included replacing the two existing treatment plants with a single plant located on Beall Road at SW Bank Road. The recommended alternative was modified in a 1994 report and this plant has been on line since 1996.

Horton Dennis & Associates, Vashon Coordinated Water System Plan, June, 1990.

This document was developed to coordinate the planning and development of water facilities in order to provide future water service in the most efficient manner possible. This plan outlines physical features, land use and zoning, population, water consumption, existing water systems, source, storage, and distribution system requirements, minimum design standards, service areas, review procedures and satellite management, and regional issues, and provides recommendations.

Landau Associates, Water District 19 Well Construction and Testing Report, Beall Teat Well, October 2007.

Wilkerson, R. L., King County Water District No. 19 Comprehensive Water Plan, April 13, 1982.

This document discusses planning issues such as historical development, the existing water system, water quality analyses, land use and population projections, water system demands, source and storage requirements, and capital improvements. Capital improvements recommended included water main replacements to replace deteriorating, undersized water mains throughout the system, water system control valves, and a new 960,000 gallon reservoir.