April 1998

RWSP

EXECUTIVE'S PREFERRED PLAN

REGIONAL WASTEWATER SERVICES PLAN

King County
Department of Natural Resources

Dear Friends,

Forty years ago, concerned residents rallied and formed a grassroots movement to clean up Lake Washington. The water was so polluted with untreated wastewater that their families could not swim or fish in it. These residents accomplished their goal, but they did so much more. Their efforts resulted in the first-rate wastewater collection and treatment system that we enjoy today.

Now we have the opportunity to do the same for ourselves and for future generations. The big difference between 40 years ago and today, however, is that we can rally before our water resources degrade to the point where we can no longer enjoy them. But we must act quickly: the recent proposal to list Puget Sound salmon under the federal Endangered Species Act (ESA) requires us to act quickly to protect water quality, and growing population in King and Snohomish Counties threatens to exhaust the capacity in our existing wastewater system by the year 2010.

For the past several years, we have been developing possible ways to meet the increasing demands of population growth while keeping our system flexible enough to respond to new circumstances like the ESA. We asked the public to help us decide on the best approach to take. Now I am pleased to present my recommendations for managing the wastewater needs of this region for another 40 years or more:

- Build a new north treatment plant, associated conveyance improvements, and a new outfall system that discharges treated effluent to Puget Sound
- Accelerate the program to control combined sewer overflows
- Implement a new incentive-based program to reduce inflow and infiltration
- Continue recycling biosolids and evaluate new biosolids technologies
- Investigate new ways to recycle and reuse water from new and existing treatment plants to help meet other water resource needs in the region

I urge you to become involved in developing a final Regional Wastewater Services Plan. Please review this document for more detail on these recommendations and provide us with your comments, questions, and concerns during the upcoming Council adoption process. Together, we can protect and preserve our important water resources.

Sincerely,

Ron Sims
King County Executive

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EXECUTIVE SUMMARY

It has been almost one year since King County issued its *Draft Regional Wastewater Services Plan* (RWSP). Much has happened between then and now to move us closer to a final plan for managing the wastewater flows that our region's growing population will generate in the next 40 years. The major activity during this year was to go into the community and hear from citizens about services they are willing to support. This was no small effort. The choices are complex, involving a number of issues. The King County Executive carefully weighed the public's views and is now ready to recommend a plan to the King County Council—a plan that reflects a strong commitment to protecting our water resources so that future generations can enjoy them as much as we do.

What Are the Issues? What Are the Choices?

The King County wastewater system serves 1.3 million residents within a 420 square-mile service area. A total of 255 miles of pipes, 38 pump stations, and 22 regulator stations move wastewater from our homes and businesses to two treatment plants. Treated and disinfected liquid effluent leaves the plants through outfalls to Puget Sound. Biosolids, the organic by-product of the treatment process, are recycled for agricultural and forestry uses.

The King County wastewater system serves 1.3 million residents within a 420 square-mile service area.

Choices made in the past have consistently favored building and maintaining a regional system that protects public health and maintains the quality of our region's water bodies. The County provides a high level of treatment—secondary treatment—at both treatment plants and has implemented an aggressive program to reduce the amount of untreated wastewater that overflows into nearby water bodies. This level of service costs money. And it will cost even more money to build new facilities and expand existing facilities to serve our customers in the years to come.

During the planning process, we gave citizens an opportunity to tell us what level of service they would like us to provide in the future. The choices were presented in the draft RWSP as options that could be adopted under four possible strategies. Two of the strategies proposed expanding the capacity of the two existing treatment plants—the West Treatment Plant in Seattle and the East Treatment Plant in Renton;[1] the other two strategies propose building a new treatment plant (North Treatment Plant) in north King County or south Snohomish County. Each strategy and option presents difficult and complex issues to consider:

- **How much can we expand our existing treatment plants?** And when do we want to expand them? The West Treatment Plant has very limited room for expansion. Under both two-plant strategies, this plant would be expanded to its maximum capacity. The East Treatment Plant would have more room for expansion. In considering expansion, should we allow flexibility for meeting demands beyond our 40-year planning window?
- **How do we serve the fastest growing parts of the service area?** It looks as if the fastest rate of growth will occur in the north

[1]*The word "capacity" used throughout this document refers to the volume of average wet weather flows that the treatment plan or conveyance system is designed to handle. Average wet weather flows are wastewater flows that occur during wet months but not during storms.*

and northeastern parts of the service area. Should we build more pipes to convey flows from these parts to existing treatment plants? Or should we build a new plant to serve these areas?

- **What levels of flow should we plan for?** In addition to the wastewater that comes from our homes and businesses, rain water (stormwater) enters wastewater pipes through sources such as roof drains and leaking pipes (inflow and infiltration).
- **What is the appropriate level and timing to control combined sewer overflows?** In parts of Seattle, sanitary sewers collect both stormwater and wastewater. During storms, flows in these pipes may exceed the capacity of the conveyance pipes and treatment plants and then discharge untreated combined sewer overflows (CSOs) to local water bodies. Should measures be taken to reduce the amount of stormwater entering the sewer system to reduce the need to expand treatment plant and conveyance pipes in the future?
- **How much of a role should reclaimed water play in the region's future water supply picture?** We may choose to use reclaimed water from our treatment plants not only for irrigating lawns and golf courses, but also to add indirectly to existing water supply. Scientific studies are needed to understand how reclaimed water can be used to supplement water supply without impacting human and environmental health. What should we do now to prepare for a future in which reclaimed water may be an important part of our region's water supply?
- **How much do we value water quality?** The four strategies in the draft RWSP would meet or exceed state and federal standards for water quality. Do we need to go further?

Rapid population growth in the Puget Sound region requires timely decisions about managing wastewater.

What Are the Recommendations?

The majority of the community expressed significant concern for protecting water quality and public health. They are willing to pay more to prevent water quality problems as long as costs and other impacts are distributed equitably. With few exceptions, they ranked CSO control as a top priority so that water bodies can be clean year round for everyone to enjoy. Reducing inflow and infiltration and continuing to recycle biosolids was also rated highly.

The main features of the plan are building a new North Treatment Plant, expanding the East Treatment Plant, and building a new outfall into Puget Sound.

After reviewing citizen preferences and available technical and financial data, the Executive decided on a strategy and accompanying options that he could recommend with confidence to the King County Council. The *Executive's Preferred Plan* reflects our region's strong commitment to preserving water quality and recycling our resources in a cost-effective manner. The main features of the plan are building a new North Treatment Plant, expanding the East Treatment Plant, and building a new outfall into Puget Sound.

The plan includes other important features:

- Making improvements to parts of the conveyance system, including pipes and pump stations, to serve treatment plants and to handle additional flows in the system

- Pursuing an aggressive CSO program, including building CSO storage tanks and treatment plants, to reduce discharges from each CSO outfall to meet the state standard of one overflow event per year on average
- Implementing a program that includes financial incentives that encourage local agencies to reduce inflow and infiltration into the King County wastewater system
- Continuing to recycle biosolids and finding ways to make biosolids recycling even more efficient
- Providing opportunities to reuse highly-treated water from the plants and continuing to study ways to economically provide reclaimed water by conducting pilot and demonstration projects, investigating stream-flow augmentation and groundwater recharge, and exploring the idea of building satellite plants to provide reclaimed water to local communities
- In addition to monthly rates, we charge new customers directly for connection to the system—a charge termed a "capacity" or growth charge. The state imposes a limit on these charges. We propose to continue to work with the state to allow us more flexibility in applying these charges so that growth pays its appropriate share of improvements to the system

After the King County Council adopts a final plan by the end of 1998, we expect to begin implementing the plan in 1999 and continue through at least the year 2030. Much can happen in such a long stretch of time—regulations can change and more information can surface. We will monitor conditions and adapt the plan as needed throughout the course of the implementation period.

How Much Will the Plan Cost and Who Will Pay for It?

The costs for each major component of the *Executive's Preferred Plan* are shown in table 1.

Customers in King and Snohomish Counties connected to the regional system have paid for wastewater services in the past. This plan assumes that they will do so in the future. But the good news is that, even though the costs for the recommended improvements are high, monthly rates are predicted to remain relatively stable. The County will sell revenue bonds each year to obtain the capital to pay "up front" for the projects and then will spread the repayment of the bonds over a 35-year period. Currently, we charge local agencies a monthly wholesale rate of $19.10 per customer. These agencies, in turn, bill their customers. Monthly rates in 1998 dollars without considering inflation are predicted to rise slightly in the early years of the implementation period but will become even lower than today's rate toward the end of the period. This lower rate is predicted to occur because the costs will be spread out over a larger population and because repayment costs for current debts will decrease.

The average monthly rate necessary to support the plan over the period 1999-2015 is $19.92 in today's dollars. Because of the debt retirement and growth of customers noted above, the average monthly rate needed over the period 1999-2030 would be $18.97 in today's dollars although actual rates will be higher due to inflation.

Finally, these costs and rates are based on planned improvements to the wastewater system only. Should additional costs be incurred, for example as part of a salmon recovery plan in response to the proposed listing under the federal Endangered Species Act (ESA), costs and rates will be correspondingly higher.

TABLE 1

Estimated Costs to Implement the Executive's Preferred Plan

Treatment	$262,000,000
Conveyance	$489,000,000
CSO	$230,000,000
Biosolids	$85,000,000
Water Reuse	$20,000,000
TOTAL	$1,086,000,000

Note: All numbers are calculated in 1998 net present value. The total includes the net present value of new capital facilities and additional operating expenses stemming from these new facilities

April 1998

DEVELOPING THE PLAN

As a regional government, King County is responsible for serving the multiple needs of its residents and businesses such as public health and safety, housing, transportation, education, economic growth, infrastructure, and environmental protection. The King County Council and Executive must consider public values and available funding when making decisions on the level of service provided to the community for each of these needs.

One of these complex issues is water resource management. Residents describe water resources as one of the most important features of the Puget Sound region. But managing water resources is more complicated than it was in the past. Today, water resources are managed over entire watersheds. Problems such as wastewater overflows, flooding, developing additional water supply, declining fish populations, and stormwater pollution are far reaching and interrelated.

This document, the *Executive's Preferred Plan*, acknowledges these relationships. Although the plan focuses on managing one element of water quality—wastewater—it also ensures that wastewater decisions are made with all regional water resource issues in mind. In this way, the *Executive's Preferred Plan* will play an important part in this region's efforts to provide high quality water for people, wildlife, and fish well into the next century.

Wastewater Management—a Regional Need

Many of us do not realize that our everyday activities generate a significant amount of wastewater. Over one million people in King County's service area take showers, wash clothes and dishes, and flush toilets. Collectively, these activities generate more than 200 million gallons of wastewater each day—enough to fill the Kingdome more than twice each week.

Where does all this wastewater go? In the past, it flowed largely untreated into Lake Washington and Puget Sound, where it significantly degraded water quality. In 1958, active citizens rallied to clean up these waters, which led to the development of a regional system to collect and treat wastewater.

Forecasts of population growth between 1990 and 2030 predict that 1.1 million new people will be living and working in King County's wastewater service area

This regional system has helped protect water quality and public health in King County for nearly 40 years, but now this system is running out of capacity. Forecasts of population growth between 1990 and 2030 predict that 1.1 million new people will be living and working in King County's wastewater service area, generating an additional 93 million gallons of wastewater each day by the year 2030[2]. At this rate, population growth will exhaust available capacity in the existing wastewater treatment system by the year 2010.

[2] *In response to comments received on the draft RWSP, King County modified its methodology for estimating population growth after 2020. See Appendix A for details.*

To protect our region's water quality, King County must act quickly to build the capacity to collect and treat this additional wastewater, meet applicable state and federal regulations, and satisfy contracts with local sewer service providers. Accomplishing this task is the goal of King County's Regional Wastewater Services Plan (RWSP).

The Regional Wastewater Services Plan

In May 1997, the County released the *Draft Regional Wastewater Services Plan* (RWSP), the *Draft Regional Wastewater Services Plan Environmental Impact Statement* (EIS), and the *Draft Regional Wastewater Services Plan Financing Plan* for public review and comment.

The draft RWSP described two general approaches to wastewater management for the next 40 years and beyond. One approach was to maximize the existing system by expanding existing treatment and conveyance facilities. The other was to add a new treatment plant in an area of rapid population growth. The draft RWSP also described two alternative strategies under each approach and fourteen options that could modify the level of service provided under each strategy. Options included water reuse and alternative design standards.

Public Preferences

To help elected officials decide on a strategy, King County conducted a public involvement process in summer 1997 after the release of the draft RWSP. As part of this process, the County provided information about the RWSP and solicited public opinion about wastewater issues. We compiled public opinion from two primary sources: (1) focus groups and a telephone survey of more than 700 randomly selected residents, and (2) written and verbal comments on the draft RWSP, EIS, and financing plan from 75 citizens, tribal governments, agencies, and other interested parties.

A comprehensive review of all public comment revealed the following preferences:

- Continue King County's commitment to clean water, public health, and safety
- Maintain the current level of service provided to customers
- Distribute costs and facility impacts equitably
- Meet all applicable regulations and projected growth estimates
- Maintain consistency with the King County Comprehensive Plan
- Provide continued opportunities for public involvement
- Accommodate changes in population, regulations, technology, and public opinion

Based on these public comments and other considerations, the Executive decided that a three-plant system based on Service Strategy 3 featuring a new treatment plant located in north King or south Snohomish County would provide the best means of meeting these needs now and in the future.

Next Steps

The release of the *Executive's Preferred Plan* and the final environmental impact statement marks the beginning of deliberations by the King County Council that will likely continue through summer and fall of 1998. Following deliberations, which include significant opportunities for public comment, the Council is expected to adopt a final plan by the end of 1998; implementation is expected to begin in 1999.

DESCRIBING THE PLAN

The County's current wastewater system is a complex collection of pipes, plants, and pump stations. This section first gives an overview of this system and then describes the changes proposed in the *Executive's Preferred Plan*. The Executive's recommendations are presented in more detail later in the section.

Our Current System

King County's wastewater system consists of 2 large wastewater treatment plants, 2 combined sewer overflow treatment plants, 38 pump stations, 22 regulator stations, 255 miles of conveyance pipe, and several outfalls (**Figure 1**). The conveyance system transports wastewater from our homes and businesses to the two treatment plants. The West Point Treatment Plant (West Treatment Plant) is located near Puget Sound west of Magnolia in the City of Seattle; the East Section Reclamation Plant at Renton (East Treatment Plant) is located east of the City of Renton. Both treatment plants provide primary and secondary treatment, which removes about 85 to 90 percent of the solids from the wastewater and disinfects the discharge from the plants.

The area that the system serves is divided into the west and east service areas, depending on which treatment plant ultimately treats the wastewater. The conveyance system in the west service area transports the wastewater to the West Treatment Plant; the conveyance system in the east service area transports the wastewater to the East Treatment Plant. The conveyance system includes forcemains, which are pipes that require pump stations to pump the wastewater flow uphill, and gravity pipes. King County owns all the large pipes, such as trunks and interceptors, that lead directly to the plant. These large pipes collect wastewater from a network of smaller pipes that are owned, operated, and maintained by 32 separate local agencies or districts in King County's service area. These pipes also collect wastewater from 83,000 residents in Shohomish County and from a small number of residents in Pierce County.

The by-products of the treatment process are disposed of or recycled:

- Most liquid effluent is discharged through outfall pipes into Puget Sound
- Some of the liquid effluent is subjected to advanced treatment beyond the secondary level to produce "reclaimed" water for irrigation and industrial reuse in and near the plants
- Treated solids ("biosolids") are recycled for use as a soil amendment for forestry and agricultural crops
- Methane recovered from treating biosolids is used to power plant processes or is sold to energy suppliers

The outfall systems are also part of the conveyance system. The outfall system from the West Treatment Plant extends directly west from the plant into Puget Sound. The outfall system from the East Treatment Plant consists of 12 miles of pipe leading to two outfall pipes extending into Puget Sound from the Duwamish Head off West Seattle.

In addition to treatment plant outfalls, the County's wastewater system includes combined sewer overflow (CSO) outfalls. In the City of Seattle, most of the sewers collect rain water ("stormwater") in addition to sanitary sewage (the water from flushed toilets, showers, sinks, and washing machines). During storms the flows in these "combined sewers" can exceed the capacity of conveyance pipes, untreated flows discharge directly from CSO outfalls to nearby water bodies.

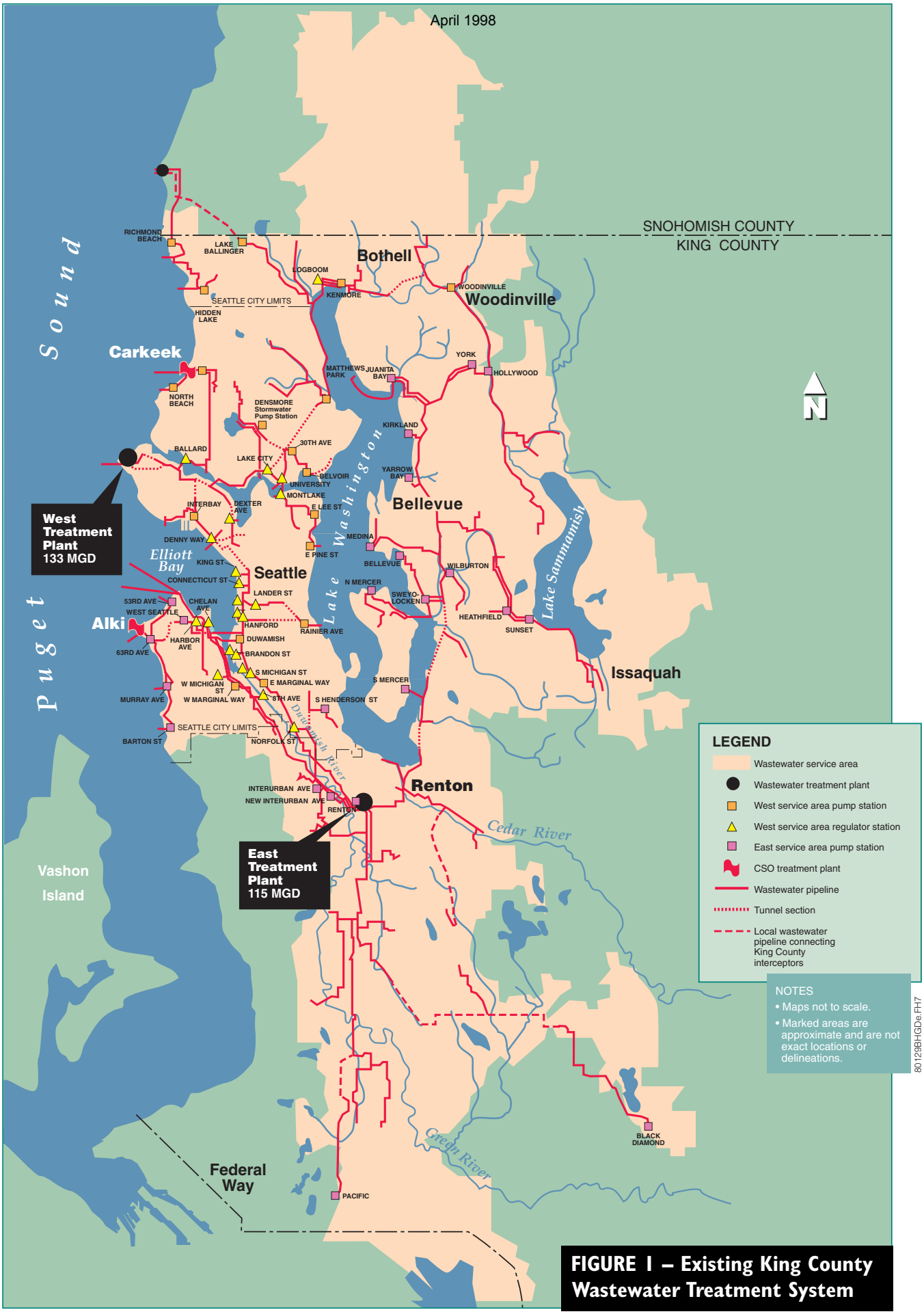


FIGURE 1 – Existing King County Wastewater Treatment System

The Executive's Preferred Plan: Our Future System

The most dramatic change to the system proposed under the *Executive's Preferred Plan* is the construction of a new secondary treatment plant (North Treatment Plant) in the north portion of the current service area and the designation of a new service area (north service area) tributary to the new plant. **Figure 2** shows existing and proposed wastewater flow routes to the treatment plants.

A New Treatment Plant

During the 1997 public involvement process, focus group and survey participants expressed about equal support for either building a new treatment plant or expanding the existing plants. Most of those who provided comments on the draft documents strongly supported a new plant. Even though constructing a new plant is more costly than expanding the two existing plants, the Executive had several reasons for selecting a 3-plant strategy :[3]

- The North Treatment Plant would allow us to reserve land area at the existing plants to build additional capacity in the future. This capacity could accommodate growth in flows from other parts of the service area resulting from higher-than-expected population growth in south and east King County or more stringent regulations
- The North Treatment Plant could be designed for possible upgrade to advanced treatment if water reuse is seen as a cost-effective and environmentally prudent

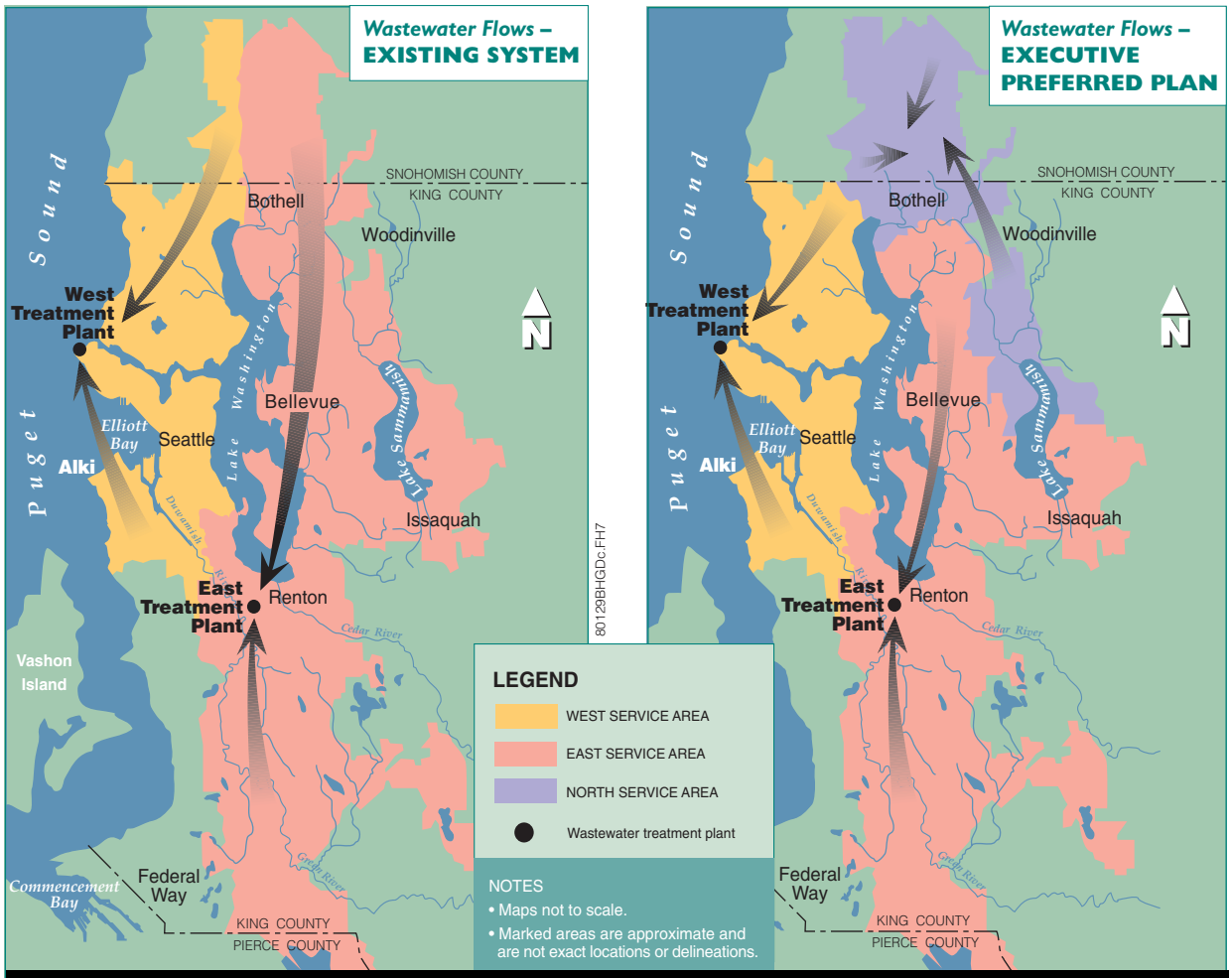


FIGURE 2 – Existing and Proposed Wastewater Flow Routes

[3]*See Appendix A for comparative costs of the four service strategies presented in the draft RWSP.*

TABLE 2

Improvements Proposed under the Executive's Preferred Plan

WASTEWATER ELEMENT	PROPOSED IMPROVEMENTS
TREATMENT	• Build a new secondary treatment plant in north King/south Snohomish County • Expand the East Treatment Plant (Renton) • Maintain the existing capacity at the West Treatment Plant (West Point) and improve the plant's ability to treat combined sewer overflows
CONVEYANCE	• Construct an outfall from the new treatment plant to Puget Sound • Construct a conveyance system to serve the new treatment plant • Expand existing conveyance pipes system-wide to meet developing needs
INFLOW AND INFILTRATION (I/I)	• Establish a cost-sharing program with local agencies to reduce inflow and infiltration • Assess a surcharge for excessive inflow and infiltration by 2010
COMBINED SEWER OVERFLOWS (CSOs)	• Construct storage and treatment facilities to meet the Washington State standard of one combined sewer overflow event per year at all combined sewer overflow locations by 2030
BIOSOLIDS	• Produce recyclable biosolids at all three plants • Explore alternative technologies to improve biosolids quality and marketability
WATER REUSE	• Research new applications for reclaimed water • Allow flexibility to produce and distribute reclaimed water at all treatment plants • Add smaller "satellite" treatment plants to augment local water supplies if circumstances warrant

alternative for developing additional water supplies in the region

- The North Treatment Plant would serve one of the fastest growing areas in the region, thus eliminating the need to upgrade large pipes leading from this area to the existing treatment plants and also minimizing construction impacts along the routes of these pipes
- The new North Treatment Plant will provide a greater level of water quality protection as upper layer discharges of treated effluent will move out of Puget Sound faster than the lower layer Duwamish Head discharge
- Eventually, our region will not be able to rely completely on the existing treatment plants. Building a new plant now before population fills in will be less disruptive to nearby communities

Other Improvements

Other improvements proposed under this plan represent a balance between the need for new system capacity and optimizing the use of existing facilities:

- Modify and expand the conveyance system to accommodate the new North Treatment Plant flows and increased flows in other parts of the service area
- Reduce the amount of stormwater and groundwater that enters the system through leaking pipes and connections to roof and street drains (infiltration and inflow)
- Meet Washington State regulations for reducing the frequency of CSOs
- Enhance opportunities to recycle biosolids and reclaimed water

Table 2 presents a summary of the projects proposed in this plan. Figure 3 shows their locations and completion dates. The remainder of

this section describes the proposals in more detail.

Treatment Improvements

This plan proposes to construct a new treatment plant (the North Treatment Plant) in the north service area, expand the East Treatment Plant to handle additional south and east King County flows, and reserve capacity at the West Treatment Plant to handle Seattle flows and CSOs. Improvements at the West Plant are planned to treat the extra CSO flows that will result from CSO control projects.

North Treatment Plant

King County would construct an 18 million gallon per day (mgd) treatment plant in the North Service Area by 2010. This plant would provide secondary treatment initially but could be upgraded to tertiary treatment if future conditions warrant; for example, if water supplies are needed and recycling water is the preferred option to meet this need or to help comply with environmental mandates like the Endangered Species Act; for example, augmenting stream flows to improve fish habitat. The plant would be expanded again by 2030 to 36 mgd followed by a possible expansion to 54 mgd by 2040. King County would evaluate population growth and wastewater treatment needs before implementing this proposed construction schedule.

The North Treatment Plant would need to be constructed by 2010 and have an initial capacity of 18 mgd.

The exact location for the North Plant is unknown. Once the King County Council adopts a plan, King County would begin a cooperative siting process (see "Implementing the Plan" for more details on siting). As part of siting a new treatment plant, we will also be looking at places to site its outfall. This plan assumes that the North Treatment Plant will be a secondary plant with a marine outfall. But as part of project level environmental work, we will be investigating other options such as a possible tertiary plant with a freshwater outfall. Environmental impacts will be evaluated as part of the project level environmental impact statement.

East Treatment Plant

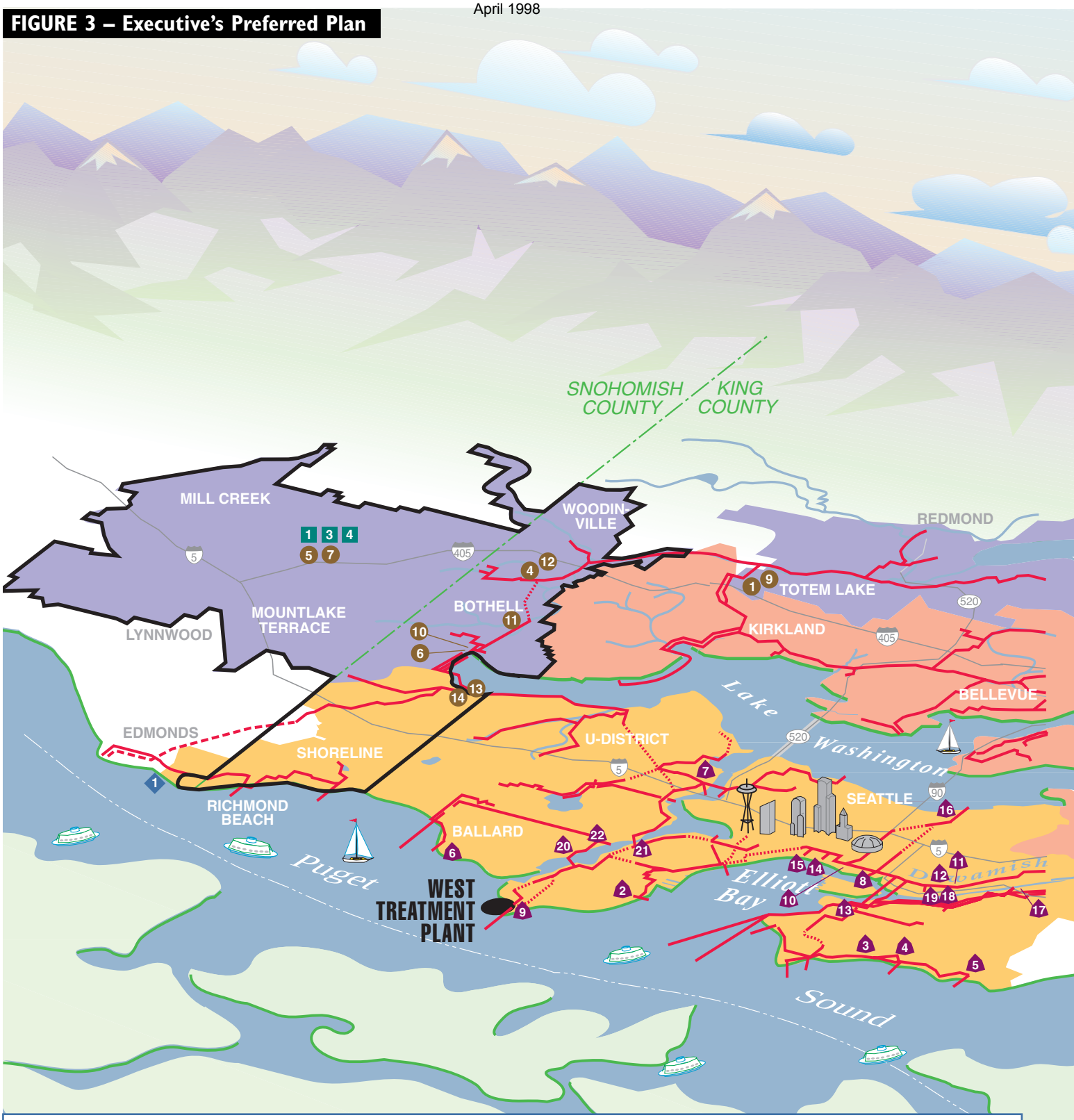
King County would expand the East Treatment Plant to handle increased wastewater flows from the southern and eastern portions of the County. The expansion, scheduled for the year 2020, would increase the plant's capacity from 115 to 135 mgd. Some or all of the plant's capacity could also be upgraded to tertiary treatment as part of future expansions or in addition to its current level of treatment using available land reserves at the plant site.

West Treatment Plant

King County would maintain the West Treatment Plant at its current capacity of 133 mgd primarily to serve the City of Seattle and handle flows from the combined sewers in the area. Maintaining capacity at the West Treatment Plant enables the County to assess the impacts on the West Treatment Plant of sending additional combined sewage to the treatment plant. Additional facilities are planned in the year 2018 to accommodate the extended peak CSO flows that will occur after storms once the CSO control projects are constructed. King County will evaluate the impacts every five years as part of the CSO Update, as required by permits.

King County's West Treatment Plant located in Discovery Park in Seattle

FIGURE 3 – Executive's Preferred Plan



CSO Projects*

1. Norfolk CSO Storage Tank (2009)
2. South Magnolia CSO Storage Tank (2010)
3. SW Alaska CSO Storage Tank (2010)
4. Murray CSO Storage Tank (2010)
5. Barton Pump Station (2011)
6. North Beach CSO Storage Tank & Pump Station (2011)
7. University/Montlake CSO Storage Tank (2015)
8. Hanford #2 CSO Storage/Treatment Tank (2017)
9. West Treatment Plant Primary/Secondary enhancements due to CSO Projects (2018)
10. Lander CSO Storage/Treatment Tank at Hanford (2019)
11. Michigan CSO Storage/Treatment Tank (2022)
12. Brandon CSO Storage/Treatment Tank (2022)
13. Chelan CSO Storage Tank (2024)
14. Connecticut CSO Storage/Treatment Tank (2026)
15. King Street CSO Conveyance (2026)
16. Hanford at Rainier CSO Storage Tank (2026)
17. 8th Ave S CSO Storage Tank (2027)
18. W Michigan CSO Conveyance (2027)
19. Terminal 115 CSO Storage Tank (2027)
20. Ballard CSO Storage Tank (2029)
21. 3rd Ave W CSO Storage Tank (2029)
22. 11th Ave NW CSO Storage Tank (2030)

*CSO control projects at Denny Way, Martin Luther King Jr. Way, and Henderson Street CSOs are part of current plans and scheduled for construction.

Treatment Plant Projects

1. Construct North Treatment Plant (2010)*
2. Increase East Treatment Plant capacity (2020)
3. Increase North Treatment Plant capacity (2030)*
4. Increase North Treatment Plant capacity (2040)*

Outfall Projects

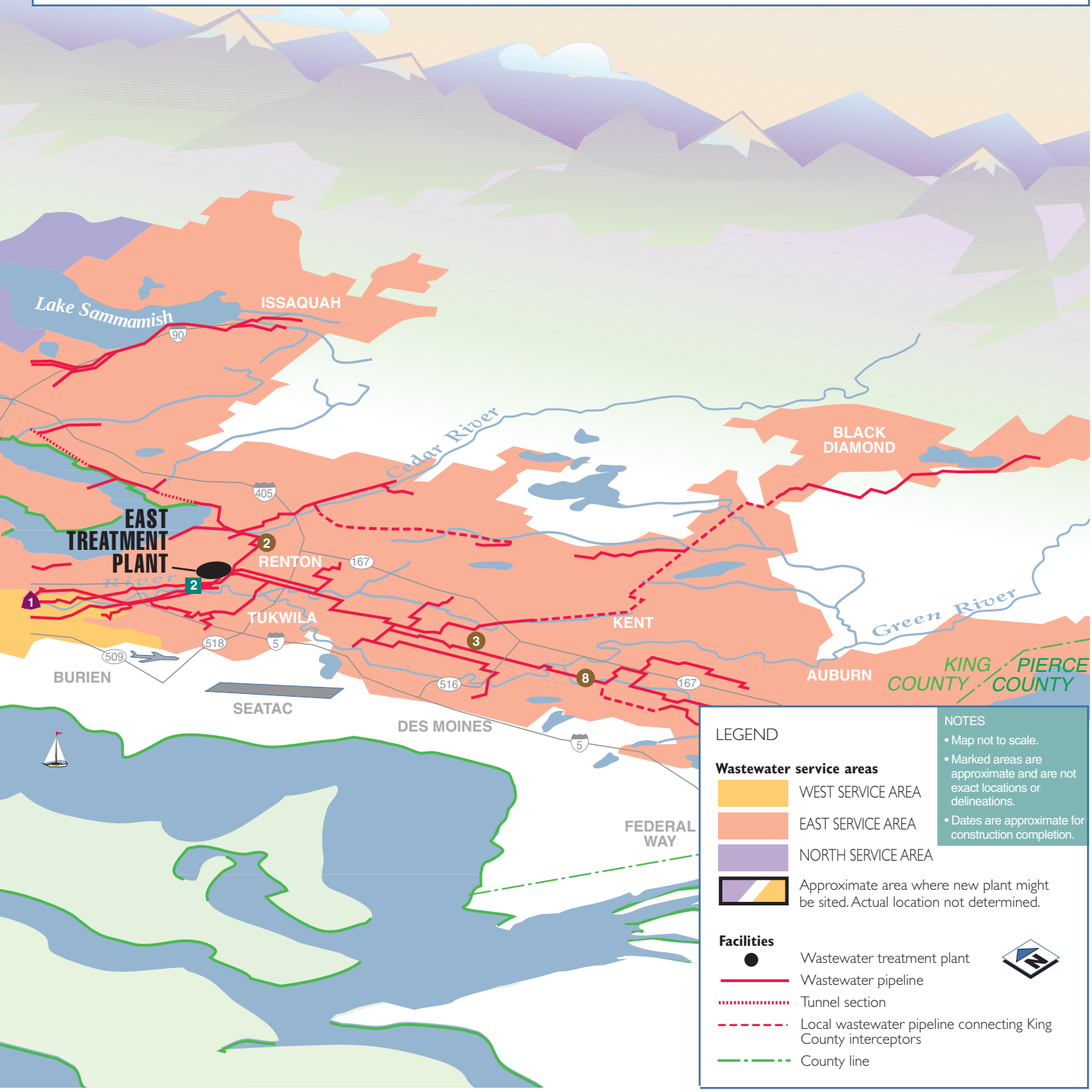
1. North Treatment Plant Outfall (2010)*

Conveyance Projects**

1. York Pump Station upgrade (2000)
2. Parallel Eastside Interceptor Section 1 (2000)
3. Parallel Auburn Interceptor Sections 1, 2, and 3 (2004)
4. Off-Line Storage at North Creek Pump Station (2005)
5. Tunnel from North Treatment Plant to Outfall (2010)*
6. New Kenmore Pump Station (2010)
7. Forcemain from new Kenmore Pump Station to North Treatment Plant (2010)*
8. Auburn Interceptor Storage (2020)
9. York Pump Station Modifications (2030)
10. Kenmore Pump Station upgrade (2030)
11. Forcemain to convey North Creek Flows to Kenmore Pump Station (2030)
12. North Creek Pump Station upgrade (2030)
13. McAleer-Lyon Pump Station Flows to Kenmore Pump Station (2038)
14. Forcemain to Transfer McAleer-Lyon Pump Station Flows to Kenmore Pump Station (2038)

*No site identified at this time for north treatment plant, conveyance, or outfall.

**Minor conveyance improvements throughout the system.



All activities at the plant would comply with the terms of the West Point Settlement Agreement, such as evaluating technologies that reduce plant impacts (for example, truck trips and odor), keeping the plant within the 32-acre limit of the plant footprint, and researching ways to reduce the number of digestors at the plant.

Conveyance System Improvements

This plan proposes two major improvements to the conveyance system. The first is to build and upgrade the pipes and pump stations needed to convey wastewater to the North Treatment Plant, and the second is to build the outfall pipes from the North Treatment Plants.

Pipes and Pump Stations

After the North Treatment Plant is sited, this plan proposes to modify the York Pump Station, which now pumps wastewater to the East Treatment Plant. The York Pump Station modifications will allow it to pump wastewater north to the North Treatment Plant. This wastewater would travel through the newly constructed North Creek Force Main to the North Creek Pump Station. Other conveyance lines would be constructed to bring flows from the North Creek Pump Station and new McAleer –Lyon Pump Station to the Kenmore Pump Station. The Kenmore Pump Station would be upgraded and conveyance lines would be constructed between the Kenmore Pump Station and the North Treatment Plant. If an inland site is selected for the North Treatment Plant, a tunnel from the North Treatment Plant to the new outfall would also need to be constructed.

Outfall to Puget Sound

The plan proposes building and upgrading the pipes that transfer treated effluent from the North Treatment Plant to Puget Sound. The County would need to construct an effluent transfer system that includes a pipe from the plant to an outfall that discharges at a good mixing site in Puget Sound; that is, a site where currents in the Sound will best disperse the treated effluent. The specific location and characteristics of the pipe would be determined around the same time that the North Treatment Plant is sited. King County may modify its plans for additional outfalls to Puget Sound depending on future developments in water reuse and legal requirements such as the federal Endangered Species Act.

As part of an expansion already underway at the East Treatment Plant, the Effluent Transfer System pumps will be upgraded by the year 2000 to maximize the amount of flow that can be conveyed through the existing pipe and outfalls in Puget Sound. However, with increases in treated effluent, additional pipes may be needed to convey treated effluent to Puget Sound. In the draft RWSP, a third outfall was proposed for discharging treated effluent to Puget Sound from the East Treatment Plant as well as an alternative option of discharging secondary treated effluent through an existing outfall to the Duwamish River in lieu of constructing another outfall.

Discharge from the existing outfall would occur during rainy periods when flows are already high in the river and no more frequently than once every two years on average. The impacts of this option were assessed as part of a larger study called the CSO Water Quality Assessment. The results of the CSO Water Quality Assessment found that there would be no significant adverse impacts to aquatic life from this discharge. In addition, by using the existing outfall there will be significant cost savings as well as decreased disruption to aquatic habitat in Puget Sound as another outfall would not need to be constructed.

Reducing Inflow and Infiltration

King County's wastewater system is running out of capacity not only because of new flows generated from population growth, but also because of inflow and infiltration (I/I). I/I is the water that enters the wastewater system during storms from sources such as leaky sewer pipes, roof drain connections, storm drains, and manhole covers (Figure 4). Most inflow comes from stormwater; most infiltration comes from groundwater.

I/I takes up a lot of space in sewer pipes and the treatment plants, which can lead to backups and overflows. King County estimates that 75 percent of peak flows in the separated conveyance system comes from these non-wastewater sources. If we could reduce I/I, we could delay, reduce, or eliminate the need to build additional expensive capital projects such as pipes and pump stations.

All wastewater systems experience I/I, and while it cannot be totally eliminated, it can be reduced. During the 1997 public involvement process, people said that I/I should be controlled and that everyone should pay for it. But reducing I/I is difficult. It is expensive to find and fix the leaky parts of the system and no single entity in King County controls the entire conveyance system. King County is able to control I/I within its own system, however it has little control over I/I from local systems where 95 percent of I/I occurs. To address I/I in local systems, this plan proposes a two-part program.

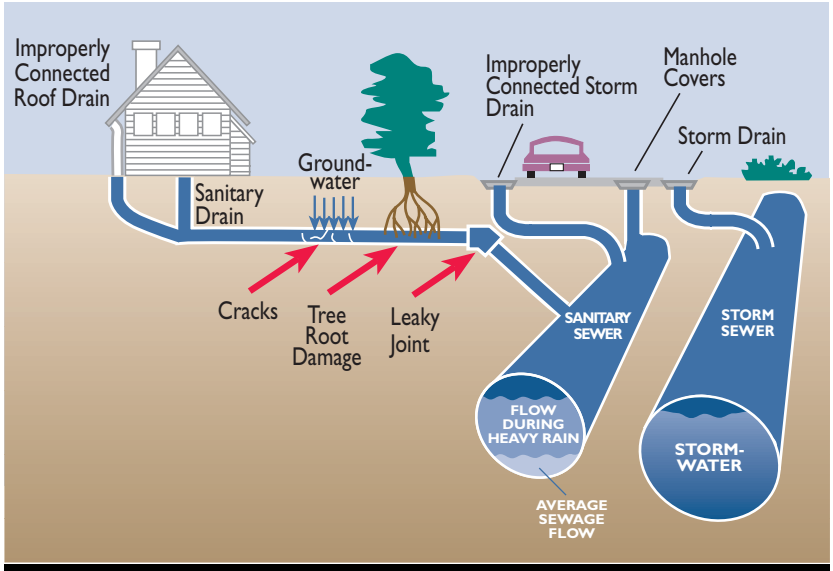


FIGURE 4 – Inflow and Infiltration into Sanitary and Storm Sewers

Cost Sharing to Find and Fix Leaky Pipes

The first part of this program, beginning in the year 1998, would provide financial incentives in the form of cost sharing with the 32 local service providers to (1) define current levels of I/I in local conveyance systems and establish what portion of that I/I is cost effective to remove, and (2) construct cost effective control projects that would help alleviate regional system capacity constraints. King County would commit $31 million as its initial share of the cost of this incentive-based program. Of this $31 million:

- Approximately $8 million would be made available to the local service providers to assess I/I in their systems and define cost-effective projects that are regionally significant. These funds would be made available on a 50/50 cost share basis.
- Approximately $23 million would pay for planning, designing, and constructing specific control projects through the year 2003. King County would cost share with local service providers to design and construct these projects. The cost share amounts would vary and be established by assessing the benefits these projects have to the King County regional system.

Developing a Surcharge on Excessive I/I

The second part of this program would design and implement a surcharge on excessive I/I, and complete additional I/I control projects. King County would work with local service providers to develop a surcharge on excessive I/I. The surcharge would be formulated based on agency-specific I/I characteristics identified during the first part of the program. The surcharge would be tailored to the unique conditions found within each individual conveyance system and the amount of I/I that could be cost effectively removed from them. In this manner, the surcharge would be fairly and equitably allocated to not place undue burden on any single service provider. Once the provisions of the surcharge are established, contracts with local service providers would be modified to reflect the implementation of this surcharge. This surcharge would go into effect no later than the year 2010.

Between the years 2003 to 2010, King County would plan, design, and construct additional local system I/I projects. These projects, defined as cost effective and regionally significant, would also be funded by a cost share between King County and local service providers. The cost share percentages would be determined on a project by project basis depending upon the potential benefit the project would have to the King County regional system. Funding for these projects would be secured from the cost savings realized from reducing flows to the regional

system and the resulting delays in capital facility construction.

Throughout the process of implementing the I/I program, King County would work closely with each of the 32 local service providers. Our goal is to cooperatively reduce local system I/I and initiate a surcharge for excessive I/I beginning in 2010. To accomplish this goal, we will:

- Provide financial and technical assistance to support the upgrade of existing conveyance systems
- Establish workable design standards for new collection systems that effectively control I/I
- Establish a surcharge program that does not unfairly burden individual local service purveyors yet ensures excessive I/I is controlled in the most cost effective manner
- Eliminate the contract provision that prohibits King County from collecting a surcharge on pipes built before 1961 in separated systems
- Establish a mechanism for monitoring flows from each individual local conveyance system for the purpose of assessing an excess I/I surcharge
- Revise County rules and regulations related to I/I and amend the agreements with local service providers

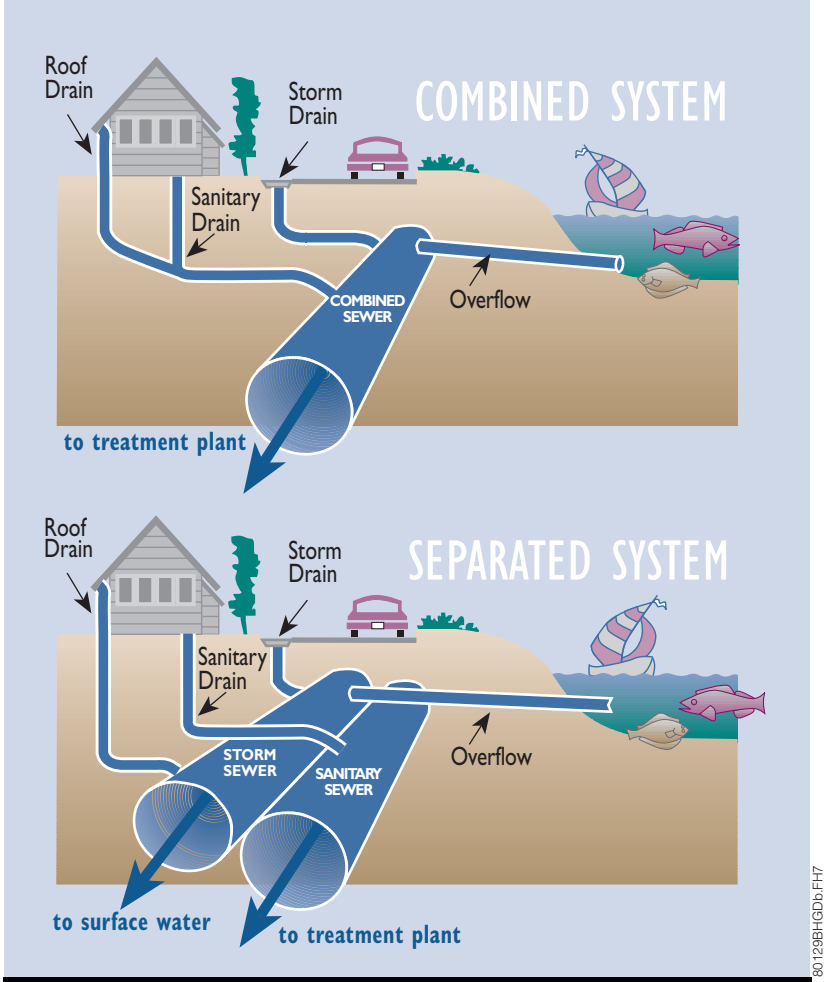


FIGURE 5 – Combined and Separated Sewers

Reducing Combined Sewer Overflows

Combined sewers are pipes that were originally built in many older cities like Seattle to collect a combination of stormwater, street debris, horse manure, and sanitary sewage from homes and businesses. Before treatment plants were built, this mixture was typically discharged to the largest nearby surface water. Today in King County, most stormwater and sanitary sewage is conveyed by separate pipes, but combined sewers still exist in many parts of Seattle where they carry a combination of sanitary sewage and stormwater to the West Treatment Plant. Figure 5 depicts the difference between combined and separated sewers.

During storms, combined sewers can sometimes fill and overflow into surface waters. These combined sewer overflows (CSOs) currently discharge at 37 different outfalls into Lake Washington, the Lake Washington Ship Canal, the Duwamish River, Elliott Bay, and Puget Sound. While the wastewater in CSOs is diluted by stormwater, it does contain harmful bacteria and pollutants that could degrade water quality and potentially affect human health.

During the 1997 public involvement process, people indicated that CSOs should be prevented even if it costs more to do so. Because of potential risks to human health and water quality, CSOs are also closely regulated at both the state

and federal levels. Washington State Department of Ecology regulations require that the County design its system to limit overflows so that the average number of untreated discharges over several years is no more than one at each CSO location per year. The regulations do not specify a date for meeting this requirement, just that CSO jurisdictions must make "the greatest reasonable reduction at the earliest possible date."

Ongoing Efforts

King County has an ongoing program to meet these regulations. The County is currently designing a project to control the one remaining CSO into Lake Washington and has several projects under way in other parts of Seattle. In the last 10 years, the County has reduced CSO volumes from an average of 2.4 to about 1.6 billion gallons per year and expects to fully meet the regulations by the year 2030—thirteen years sooner than proposed in the draft RWSP. By accelerating the CSO program by thirteen years, net present value CSO Control program costs increase $35 million from $195 million to $230 million and adds ten cents per month on average to the wholesale sewer rate paid by customers.

Denny Way CSO in Seattle's Myrtle Edwards Park

CSO Storage and Treatment

This plan proposes two basic approaches to reduce untreated CSOs. The first includes constructing large underground tanks and tunnels to store combined flows during storms. These flows would then be pumped to the West Treatment Plant once the rain subsides. Additional improvements may have to be made at the West Treatment Plant to treat additional CSO flows conveyed to the treatment plant from these projects. The second approach includes treating the combined sewage at existing CSO outfall locations using technology to remove solids and disinfect the combined sewage before discharge.

In certain areas such as North Beach, West Seattle, and Magnolia, CSO control projects would include routing roof drains into storm drains in the streets and repairing leaky side-sewers that connect sanitary sewers from homes to the conveyance system. This program will be implemented as part of the Inflow and Infiltration Reduction Program.

The County has prioritized its CSO projects to protect public health, beginning with the construction of CSO projects along Puget Sound beaches and the east end of the Lake Washington Ship Canal. The next phase of projects would be built along the Duwamish River and the west end of the ship canal.

King County may propose additional refinements to the CSO program in response to changing conditions and new information. The proposed listing of salmon under the federal Endangered Species Act may affect project priorities and timing. In addition, the County is conducting a CSO Water Quality Assessment (WQA) and sediment analysis in the Duwamish River and Elliott Bay that will provide useful information for optimizing the CSO program. The WQA will be completed in 1998; the sediment analysis will be completed in 1999.

Recycling Biosolids

This plan reflects our region's strong recycling ethic and desire for more efficient use of resources. King County is committed to recy-

cling the by-products of the wastewater treatment process to the greatest extent possible.

One by-product that is currently being recycled is biosolids. Biosolids are the organic materials removed from wastewater during the treatment process. King County currently produces "Class B" biosolids at both the East and West Treatment Plants through anaerobic digestion, a treatment process that relies on microorganisms to break down and stabilize the raw organic solids in the absence of oxygen. Class B biosolids contain significantly reduced disease-causing microorganisms (pathogens) and can be safely applied to land with limited public access such as agricultural and forest sites, which is where it is currently being used.

Biosolids are used as fertilizer in eastern Washington for wheat, hops, and other grain crops.

King County produces approximately 135,000 wet tons of biosolids annually—all of which is recycled. We have supplied biosolids for commercial and public forestlands for the last 20 years; more recently, we began supplying biosolids for agricultural uses in eastern Washington. King County now recovers a portion of its processing and distribution costs from the Class B product from sales to these two markets. In addition, a small percentage (about 10 percent) of biosolids are composted by a private firm into a pathogen-free "Class A" product called GroCo. Class A biosolids have no detectable pathogens, so state regulations allow them to be used for landscaping and home gardens. During the 1997 public involvement process, people indicated that the County should continue recycling biosolids.

King County produces approximately 135,000 wet tons of biosolids annually—all of which is recycled.

Continue Recycling and Explore New Technologies

This plan proposes to continue to produce Class B biosolids using anaerobic digestion at the East and West Treatment Plants and to implement the same process at the North Treatment Plant until the County is confident new technology can be used reliably. The plan also proposes that the County continue to evaluate alternative technologies to reduce the water content of biosolids while preserving their marketability. Two new processes are currently being evaluated: Centridry—a high-speed centrifuge that applies heat to reduce the water content of biosolids—and VerTad—an anaerobic digestion process that takes place in deep underground shafts. In addition, the County plans to test other technologies that produce even higher quality Class A biosolids.

The goal of this testing is to select a technology that best meets all criteria, including product quality (Class A or B), marketability, odor, rate impacts, reliability of the treatment process, amount of land needed for the treatment facility, and the number of truck trips needed to transport the biosolids. Based on the results of this testing and public comment, the County will implement one of three biosolids handling scenarios at the treatment plants:

- Continue using anaerobic digestion
- Supplement anaerobic digestion with another technology
- Replace anaerobic digestion with another treatment technology

Finally, King County will continue using a public-private partnership approach to recycling biosolids. One example of this is the 1995 Biosolids Forestry Agreement with the Mountains To Sound Greenway, the Washington State Department of Natural Resources, the Weyerhaeuser company, and the University of Washington. This 50-year agreement provides for

use of biosolids on working forests in King County to enhance wildlife habitat and generate long-term income from selective timber harvests.

Exploring and Increasing Water Reuse

Population growth drives the need not only for additional capacity in the regional wastewater system but also for additional water supply. Our region's established water supply sources will provide adequate water supply for projected growth until about the year 2013. Our region must therefore develop additional water supplies while preserving high quality water for fish, wildlife habitat, and recreation.

One potentially significant source of water supply is reclaimed water. Reclaimed water is wastewater that receives advanced treatment such that it can be used to water lawns and golf courses.

One potentially significant source of water supply is reclaimed water. Reclaimed water is wastewater that receives advanced treatment beyond secondary treatment. Some cities are already using reclaimed water for irrigation, industry, and in other ways to supplement the water supply.

Using reclaimed water is not only consistent with the region's recycling ethic, but it offers several advantages as well. For example, reclaimed water is available even during hot dry summers when drought can threaten other water supply sources. Reclaimed water can be used to augment surface water and groundwater resources. In addition, reclaimed water ultimately may be more cost effective and less disruptive environmentally than continuing to develop traditional sources of water supply using dams, reservoirs, and pipelines, and its ultimate advantage is that it provides a "new supply" that does not have to be taken away from fish. Given the recent proposal by the federal government to list Puget Sound Chinook under the Endangered Species Act (ESA), reclaimed water may be the only viable new water available for future growth.

Both the East and West Treatment Plants now produce reclaimed water for use in irrigation and industrial processes at locations in and near the plants. This type of use is termed "direct non-potable"; that is, water not used for drinking. King County is evaluating the potential to use reclaimed water as an indirect source of potable (drinkable) water. This use, termed "indirect potable," could involve discharging reclaimed water to area water bodies (such as Lake Washington, Lake Sammamish, the Ship Canal, or groundwater) and withdrawing water for drinking from another location in the same watershed. This would offset pressure on existing water supply sources. This has been implemented in other parts of the country, even in Washington State, but it has not been done in our region.

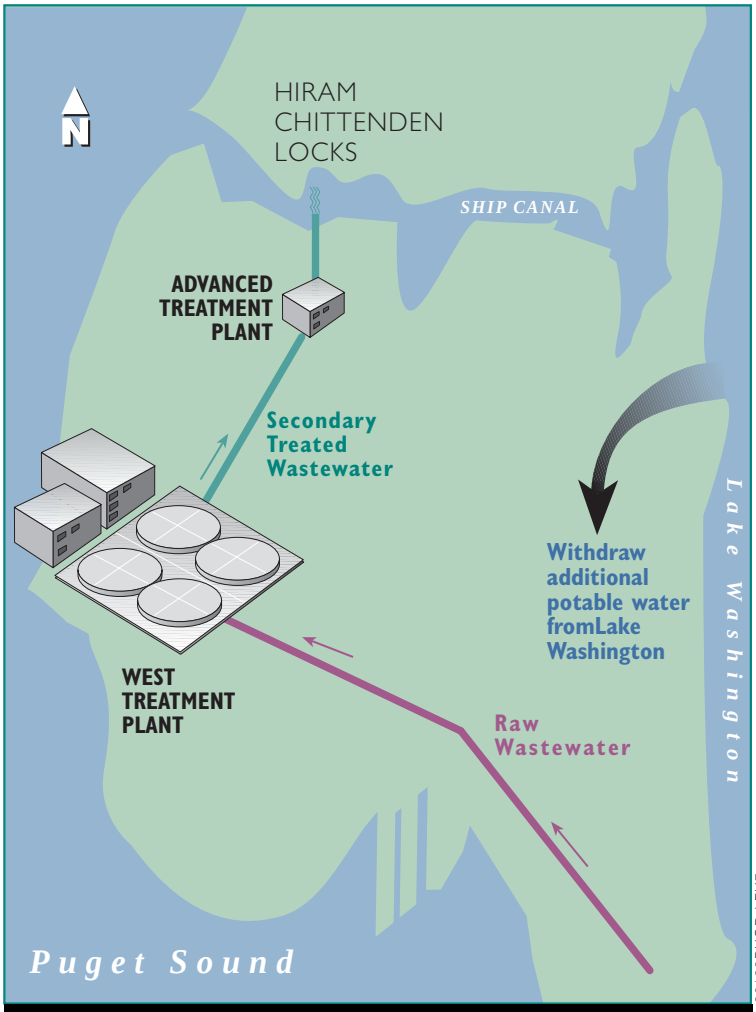


FIGURE 6 – Potential Indirect Potable Reuse Project: Discharging Reclaimed Water at Hiram Chittenden Locks

Figure 6 shows an example of a possible indirect potable reuse project.

Coordinate, Evaluate, and Explore Future Opportunities

This plan proposes that the County work with water suppliers to plan and implement water reuse projects. Direct non-potable reuse projects, such as increasing industrial and irrigation uses, will be evaluated for near-term implementation. Because the participants in the 1997 public involvement process supported the concept of water reuse but needed more information, reuse projects such as streamflow augmentation or groundwater replenishment will require more research, monitoring, and survey of public opinion before implementation. King County will coordinate with other interested parties to conduct the required technical and environmental studies, public involvement, baseline monitoring, and technology assessments, and to resolve legal and institutional issues related to reclaimed water.

If public attitudes, economic conditions, and environmental mandates surrounding water reuse are favorable, King County may explore the possibility of constructing one or more "satellite plants." Satellite plants are essentially small treatment plants that would provide high quality effluent to be recycled in the vicinity of the satellite plant, but solids would be transferred to the regional plants for processing. The County could build such plants in cooperation with a local community and then provide them with high-quality reclaimed water. However, this would only occur if the satellite plant remained part of the regional wastewater system and the reclaimed water produced at that plant would be distributed through the regional water supply system.

IMPLEMENTING THE PLAN

King County is expected to begin implementing the *Executive's Preferred Plan* in the year 1999. As a precursor to constructing proposed capital projects, implementation will involve a mixture of activities including planning, public involvement, evaluating possible environmental impacts, siting and acquiring property for a new treatment plant, undertaking additional studies, and permitting, as shown in Figure 7.

In the first few years of implementation, King County plans to conduct a public process to find possible sites for the new North Treatment Plant, select and purchase a site, and conduct studies to determine where to locate the outfall pipe for discharge into Puget Sound. These activities are necessary preliminaries to designing, permitting, and constructing the plant by 2010. The first few years will also include construction of minor conveyance improvements not specifically discussed in this plan.

This plan identifies a number of major capital facilities that are needed to meet regulations and accommodate future population growth, including new and upgraded treatment plants, outfalls, conveyance pipes, storage tanks, pump stations, and combined sewer overflow control projects. The schedule for completing the specific capital projects is shown in Figure 8.

In February 1998, the National Marine Fisheries Service proposed listing the Puget Sound Chinook salmon as a threatened species under the Endangered Species Act (ESA). King County is working in cooperation with Pierce and Snohomish Counties and local governments to develop a response to the listing that will allow the area to thrive economically while enhancing and improving salmon habitat. The Executive's Preferred Plan provides the flexibility to modify our facilities and programs to address changing conditions. As the ESA response is developed, King County will coordinate with federal, state, and local agencies including the National Marine Fisheries Service, tribal governments, and citizens to ensure our wastewater facilities will benefit salmon restoration programs in Puget Sound.

An Adaptable Plan

Because implementing this plan is a long-term process, the County expects conditions to change during implementation. To allow for these changes, we will monitor conditions that could affect the plan and "check in" at key points to ensure that decisions still make sense. For example, we expect to do the following:

- Revisit growth estimates during the design stage of each capital project to ensure that the facilities are sized correctly and built at the right time to accommodate new growth
- Track federal, state, and local regulations and change the plan if warranted
- Modify projects if environmental conditions change
- Participate in developing and implementing plans in response to the proposed listing of Chinook Salmon under the federal Endangered Species Act
- Consider new wastewater technologies and information from studies that might provide more efficient and cost-effective service to ratepayers

The County will monitor conditions (e.g., population growth, etc.) that could affect the plan and will make any necessary changes to facilities to reflect any new conditions.

- Solicit and incorporate public opinion throughout the implementation of this plan

Siting New Facilities

This plan calls for expanding existing facilities and siting many new ones, including a new treatment plant and outfall located in the vicinity of the North Service area, but the exact location of the new plant and outfall has not been decided. King County must identify a site quickly: at least 10 years are needed to design, permit, and construct the North Plant, so a suitable site for the plant and its outfall must be found by the year 2001.

For the new treatment and associated facilities King County envisions two key components of a workable siting process: (1) perform an assessment of available or underdeveloped large parcels of land, and (2) develop and implement a decision-making process.

King County would begin by examining large parcels of land in the vicinity of the North Service Area. A site of 30-60 acres will likely be needed. Issues would include size, environment, geography, social/economic issues, availability, zoning, ability to get required permits, access, community and political concerns, and potential local and regional benefits of a treatment plant. Local communities would be encouraged to offer specific parcels for consideration.

Once an inventory of sites is developed, King County would design a decision-making process that involves local communities in developing criteria and narrowing the field of candidate sites. We commit to a meaningful public involvement effort from the earliest stages of the siting process.

King County will shorten the list of sites using technical criteria as well as local community attitudes and priorities—values that will be reflected in the siting process and in subsequent mitigation. King County has developed amenities reflecting community interests with its wastewater projects in the past. Two examples include Waterworks Garden at the East Treatment Plant in Renton and the Interurban Pump Station in Tukwila.

The County's goal is to construct a regional facility that enhances quality of life, not just in the region, but in the local area where the facility is sited.

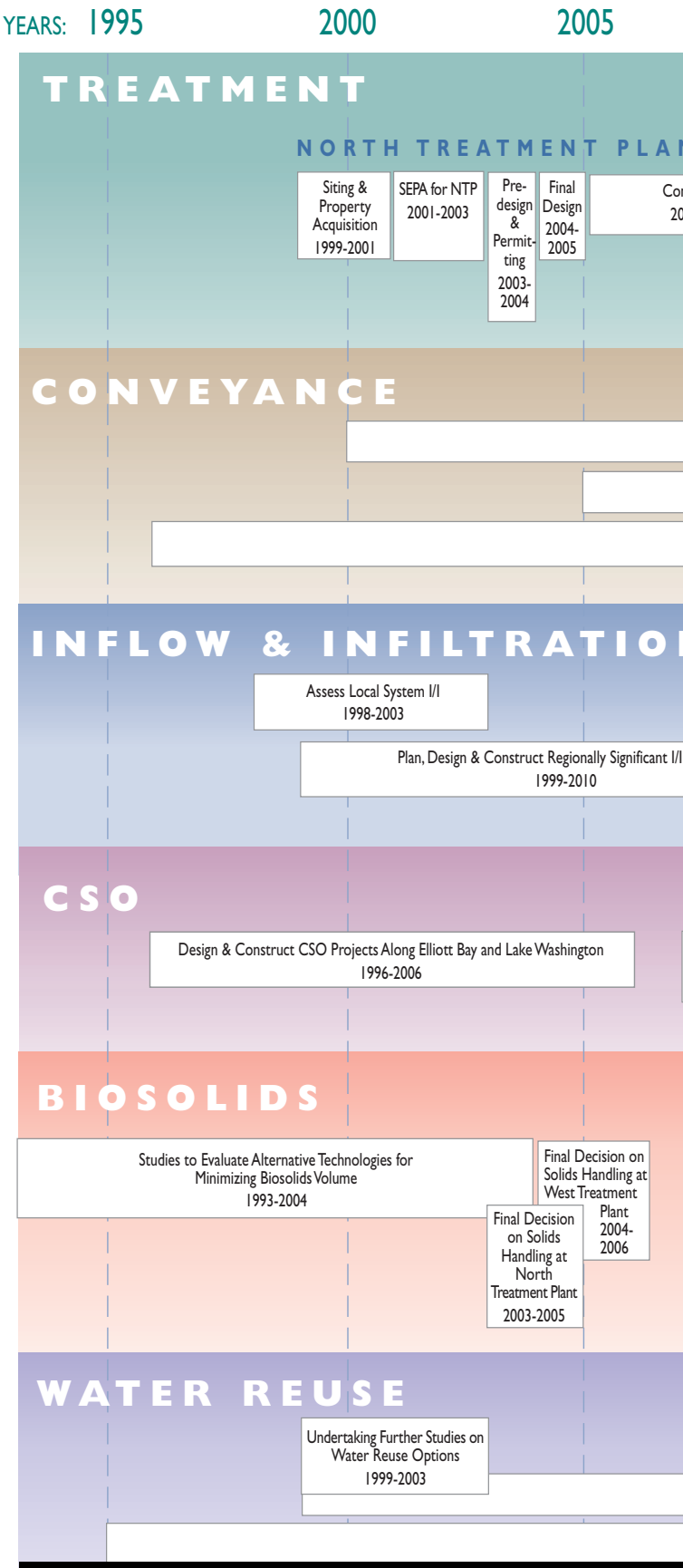
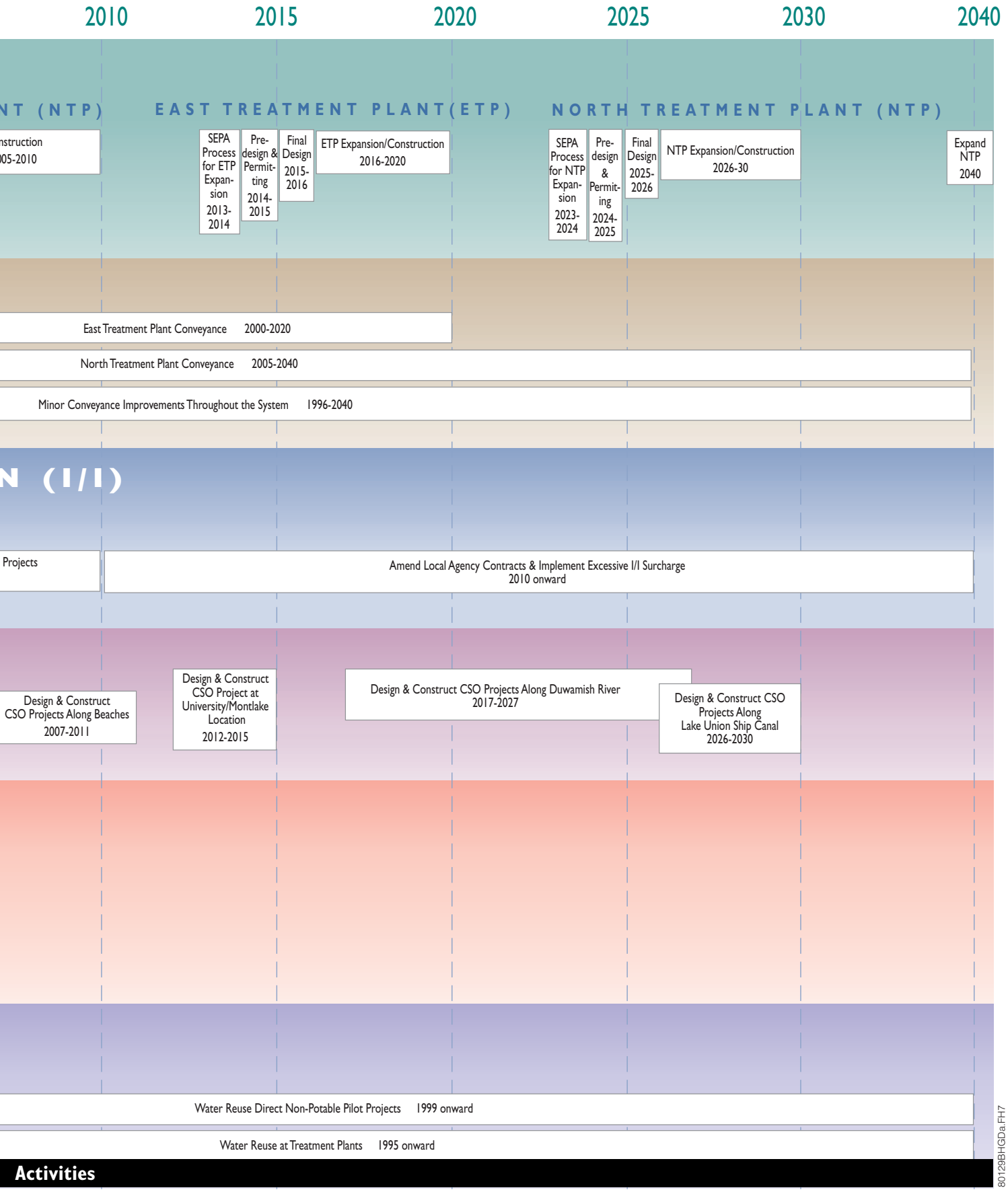


FIGURE 7 – Executive's Preferred Plan Implementation


2010
2015
2020
2025
2030
2040
NT (NTP)
EAST TREATMENT PLANT(ETP)
NORTH TREATMENT PLANT (NTP)
nstruction 005-2010
SEPA Process for ETP Expan-sion 2013-2014
Pre-design & Permit-ting 2014-2015
Final Design 2015-2016
ETP Expansion/Construction 2016-2020
SEPA Process for NTP Expan-sion 2023-2024
Pre-design & Permit-ing 2024-2025
Final Design 2025-2026
NTP Expansion/Construction 2026-30
Expand NTP 2040
East Treatment Plant Conveyance 2000-2020
North Treatment Plant Conveyance 2005-2040
Minor Conveyance Improvements Throughout the System 1996-2040
N (I/I)
Projects
Amend Local Agency Contracts & Implement Excessive I/I Surcharge 2010 onward
Design & Construct CSO Projects Along Beaches 2007-2011
Design & Construct CSO Project at University/Montlake Location 2012-2015
Design & Construct CSO Projects Along Duwamish River 2017-2027
Design & Construct CSO Projects Along Lake Union Ship Canal 2026-2030
Water Reuse Direct Non-Potable Pilot Projects 1999 onward
Water Reuse at Treatment Plants 1995 onward
Activities
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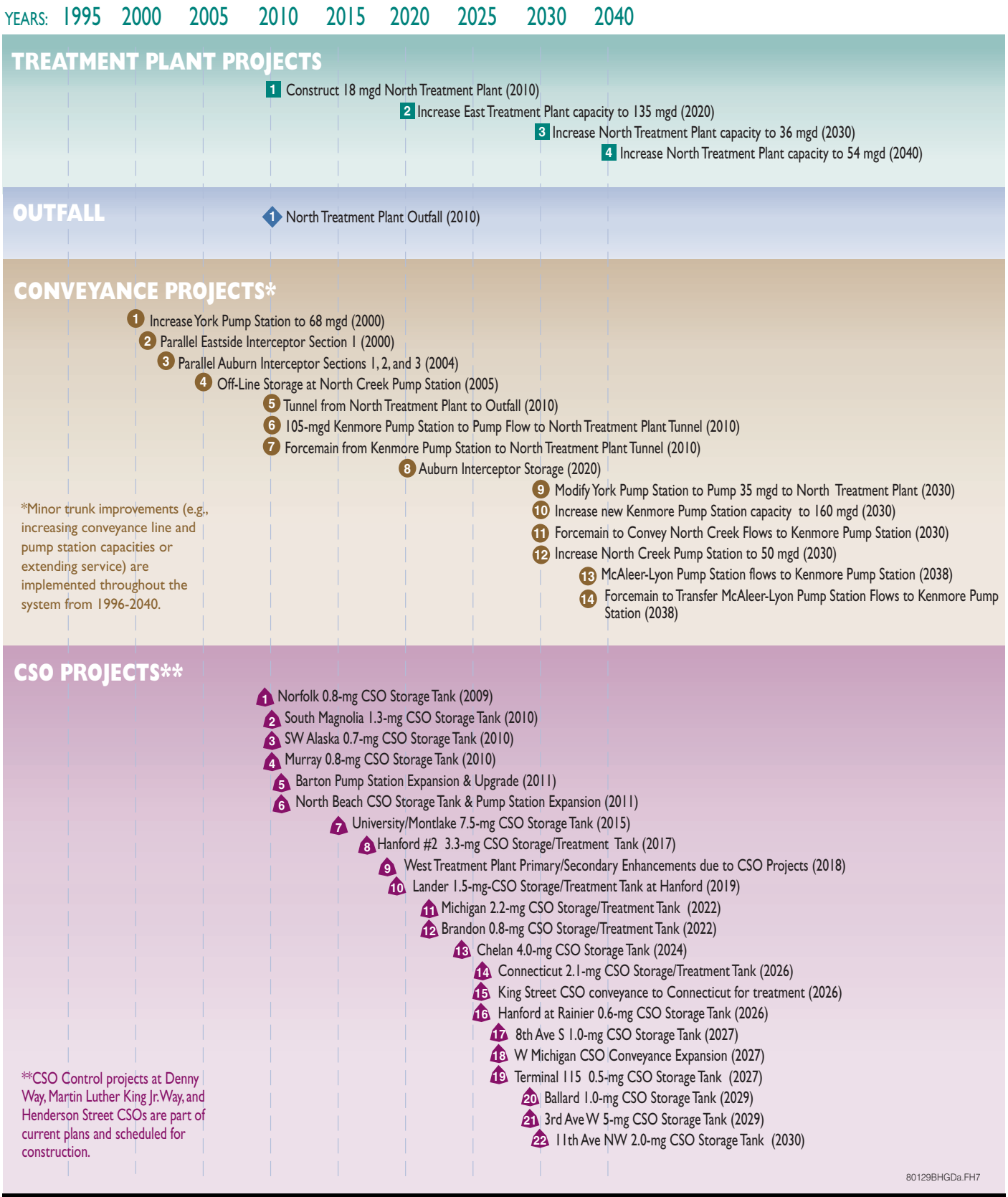

FIGURE 8 – Phasing of Capital Facilities by Date of Completion

Siting Principles

The details of the siting process, including the public involvement elements, will be developed further after the initial assessment is complete. The process will reflect the issues identified in the assessment. The following principles will guide the siting process:

- A treatment plant site will be selected by 2001
- The siting process will be flexible to adjust to change
- Partnerships with other jurisdictions adjacent to King County's service area will be sought to maximize the use of facilities
- Criteria for a site will comprehensively evaluate environment, technical, financial, and community needs
- Costs will be kept within guidelines
- All parties with a significant interest in the siting process will be involved in the decision process. Parties with an interest in the issues will vary over time, and the process will be open so that new parties can enter and leave the process accordingly
- Communities will help develop the criteria by which a site is selected and may help identify what is needed to mitigate impacts and enhance the community when a plant is built
- King County will meet agreements made with local communities
- Citizens in the region and in local communities will have access to relevant information
- King County will support local community efforts to effectively participate in the process to site new facilities
- King County will listen and respond to input from citizens and communities

The parklike Waterworks Garden at the East Treatment Plant treats stormwater while providing open space for wildlife and people.

Although the above process and siting principals focus on the new treatment plant and associated facilities, King County will use this approach for other new facilities and for expanding existing facilities.

Wastewater Policies

This plan is based on technical and scientific research, public and stakeholder input, and policy. The policies that guide this plan are included in Appendix B. Some of these policies were developed in the past and used as guides in developing this plan and some of these policies are new—such as building a new treatment plant, water reuse, and reducing inflow and infiltration into King County's wastewater conveyance system. These policies will be reviewed from time to time and modified to reflect any changes in direction based on continued research and public opinion.

April 1998

PAYING FOR THE PLAN

King County currently spends about $150 million each year to operate and maintain the existing wastewater system, repay money borrowed to construct capital projects, and implement wastewater management programs. Of the $150 million spent each year, approximately $30 million is used for asset replacement. The *Executive's Preferred Plan* proposes new capital facilities and associated maintenance and operation activities that will add to this ongoing cost. Table 3 estimates the present value of these new costs through the year 2030. These costs are based on assumptions in population growth and increases in the level of inflow and infiltration in the system and that there are no added costs for uncertainties such as the Endangered Species Act. They could either increase or decrease if actual circumstances differ from these assumptions.

Several large facilities account for the majority of the treatment and conveyance costs shown in the table. These include the new North Treatment Plant, the facilities for pumping and conveying flows from the existing system to the plant, and the new outfall system for the North Treatment Plant.

Paying for Projects with Bonds

Projects such as a new treatment plant, major conveyance and pump station upgrades as well as CSO control projects range in costs from a few million dollars to over $100 million. This plan proposes to spread the costs to ratepayers over time to keep rates steady. King County will accomplish this by selling bonds, in the same way that we have financed projects in the past.

Bonds would be sold each year to provide the primary source of funding for this plan (including an estimated $30 million in capital replacement costs). A smaller share of annual capital costs will be paid for using annual revenues. Selling bonds to pay for the projects is like borrowing money to buy a house. King County uses its revenues from rates and capacity charges to secure a long-term loan. The loan is repaid over the long-term, with interest, like a home mortgage. Revenue from rates and capacity charges is used to pay the annual debt repayments. This plan assumes that the revenue bonds will have 35-year terms and that they will have constant annual payments—similar again to standard mortgages.

TABLE 3

Estimated Costs to Implement the Executive's Preferred Plan

Treatment	$262,000,000
Conveyance	$489,000,000
CSO	$230,000,000
Biosolids	$85,000,000
Water Reuse	$20,000,000
TOTAL	$1,086,000,000

Note: All numbers are calculated in 1998 net present value. The total includes the net present value of new capital facilities and additional operating expenses stemming from these new facilities

Currently, the County uses some general obligation bonds that are secured by the property tax base in King County. This enables the County to acquire lower interest bonds which keeps rates lower. The County will continue looking for methods such as this to obtain lower interests in borrowing, but future costs and rates shown here do not assume the use of general obligation bonds.

Collecting Revenue

King County's monthly charges are its primary means of funding the costs of constructing, maintaining, and operating the County's regional wastewater system. In keeping with current practices and contracts, the plan proposes to pay for ongoing costs and the added costs from new facilities using the same revenue sources it currently employs—monthly rates and capacity charges. A secondary means of funding the costs is from collecting a capacity charge from new connections

Monthly Rates

King County is a wastewater wholesaler; that is, the County sells capacity in its regional system to local sewer agencies. It charges local agencies each month based on the total number of households and commercial customers in their districts. This monthly charge is the County's primary means of funding the costs for constructing, operating, and maintaining the existing wastewater system (generating over 95 percent of actual annual revenues). The local agencies, in turn, bill each customer in their service area.

The breakdown on how the monthly rate of $19.10 per customer is used, both by expenditure and program type, is shown in Figures 9 and 10.

The proposed facilities in the Executive's plan create additional capital, operation, and maintenance costs, increasing the amount to be recovered from the rates. Figure 11 shows projected future monthly rates. The shape of this line is affected by two additional factors—population and debt retirement. Over the next decade, the rate increases steadily as we add new facilities to accommodate growth, and at the same time, make payments on existing debt. At 2015, the line drops as we pay off a large share of that debt and the line continues to decline as the population grows and we have more customers to share the costs of the system.

The average monthly rate necessary to support the plan over the period 1999-2015 is $19.92 in today's dollars. Because of the debt retirement and growth of customers noted above, the average monthly rate needed over the period 1999-2030 would be $18.97 in today's dollars. However, just as the price of a home, groceries, and other consumables goes up with inflation, so will the monthly sewer bill. Figure 12 shows the what rates may be when inflation is included, assuming a 3 percent inflation rate (actual inflation rates may vary over time).

King County's Wastewater Treatment Division has implemented a number of programs that have resulted in cost savings and lower rates for our ratepayers. Presently, the Division is undertaking a number of benchmarking studies with similar wastewater utilities on the West Coast to identify ways to become more efficient while still delivering high quality services. King County will continue to evaluate opportunities to increase efficiencies as this plan is implemented.

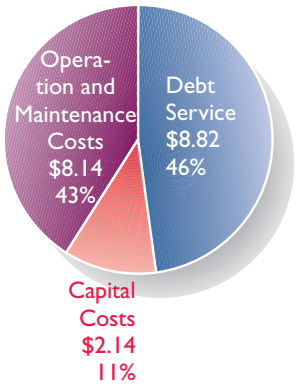

FIGURE 9 – Components of Current Wholesale Monthly Rate, by Expenditure

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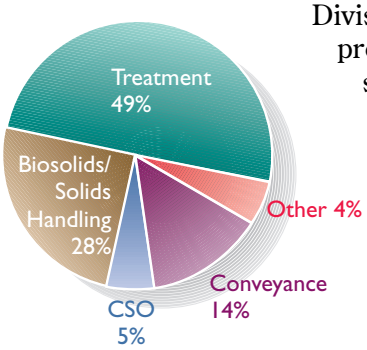

FIGURE 10 – Components of Current Wholesale Monthly Rate, by Program Type

Capacity Charge

In addition to charging monthly rates on all households, King County also charges for each new connection to the wastewater system to help offset the added impacts of population growth on the system. The charge is linked to the cost of excess capacity of existing facilities, and is assessed monthly for 15 years to households or businesses with new connections to the sewer. Unlike the monthly rates, the capacity charge is billed directly by King County to the individual household or business. The County's current capacity charge is $10.50 per month per customer—the maximum allowed by state law.

The terms of existing state law will provide an increasingly restrictive limitation on future capacity charge levels that can be assessed under the *Executive's Preferred Plan*. To enable King County to capture an equitable share of future costs through capacity charges, this plan proposes that the County continue its recent legislative initiatives to attain greater flexibility in setting these charges and working with our customers in refining the capacity charge program, and to ensure that growth pays for growth.

The rates projected in this plan assume the existing capacity charge authority under state law. Right now the capacity charge is $10.50, but this may drop as low as $7.00 if changes are not made to existing state law. If the County is successful in changing the state legislation and having a higher capacity charge which reflects the true cost of growth, the corresponding monthly rates will be somewhat lower than what is shown in this plan.

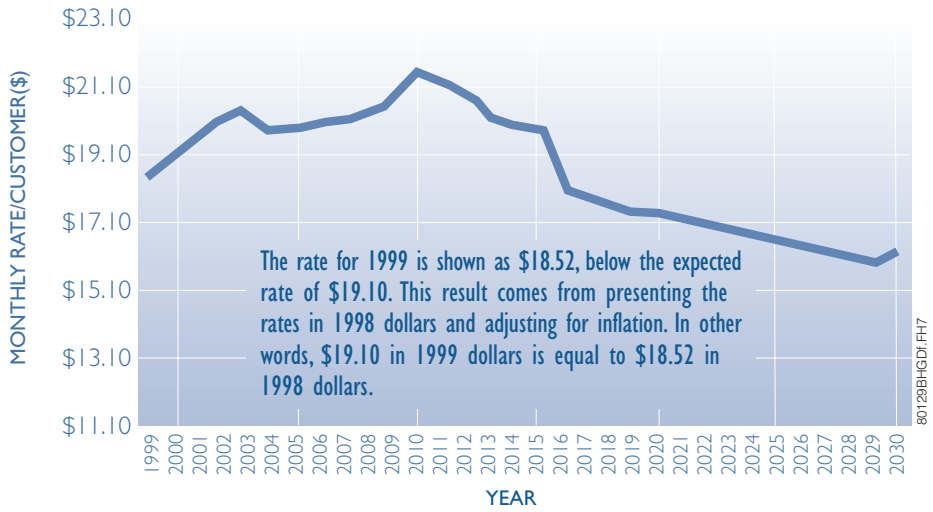

FIGURE 11 – Projected Monthly Wholesale Rates (without inflation)

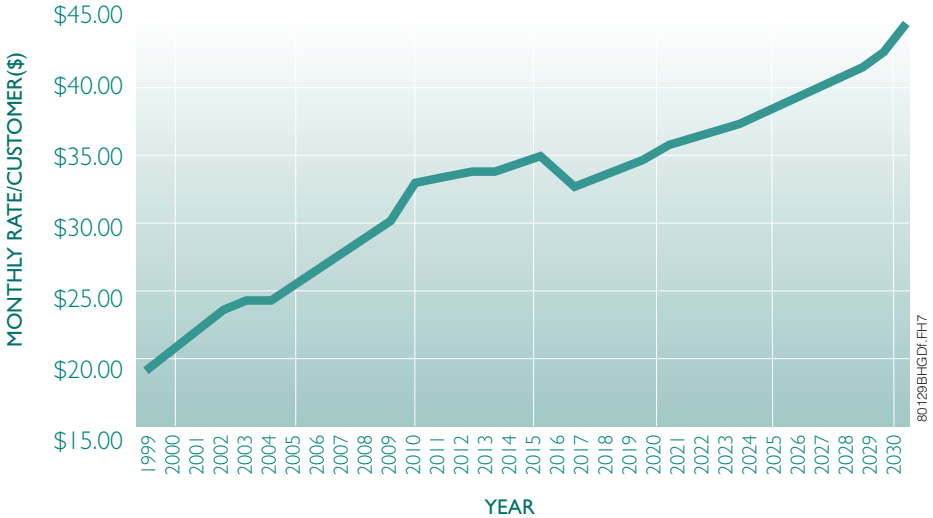

FIGURE 12 – Projected Monthly Wholesale Rates (with inflation)

April 1998

APPENDIX A

Changes in Population and Flow Estimates

The strategies presented in the 1997 draft RWSP were developed using wastewater flows estimated out to the year 2050. These flows were based on two different methods of population and employment forecasts. The first method, used for the period 1997 to 2020, relied on population projections from the Puget Sound Regional Council (PSRC). Because PSRC projections were not available past 2020, King County used a second method to forecast population from 2020 through 2050. This method used an "exponential growth function" that estimated population growth at the high end of the spectrum. This method is considered conservative because it prepares a utility to meet the challenges posed by the demands from a rapidly-increasing population, although these demands may not materialize as quickly as the forecasts predict.

Following the release of the draft RWSP, King County received comments that the forecasting methodology should be reviewed because the rate of growth and projected population from 2020 to 2050 appeared very high. In response, the County evaluated other alternatives and selected a less conservative method to estimate wastewater flows for the *Executive's Preferred Plan*. The method selected was a "linear trend function" and this straight-line approximation had the effect of lowering population projections after 2020. Figure 13 shows the differences in sewered population estimates between the draft RWSP and the *Executive's Preferred Plan*.

This revised method yielded a seven percent decrease in estimated sewered population for the wastewater service area in 2030. The effect of this change was to reduce the total projected number of gallons of additional treatment capacity required over the planning period. As a result, some of the major conveyance improvements originally proposed in the draft RWSP were downsized, delayed, or eliminated in the *Executive's Preferred Plan*. Table 4 shows the differences in the size and phasing of capital improvements for each service strategy between May 1997 (using the exponential growth function) and April 1998 (using the linear trend function).

The corresponding capital facility costs for each of the four strategies are shown in Table 5.

Another minor change in flow estimates resulted from updating the King County Wastewater Service Area boundaries to match Snohomish County's current urban growth boundary. This change lowers the projected wastewater flow to King County facilities by 1 percent in 2030.

Population forecasting is a planning tool that is revised periodically. King County will continue to revisit population growth assumptions when designing wastewater facilities to ensure that wastewater facilities are available to serve growth, but are not built too soon or too large. During the planning process, King County examined a number of different population and growth scenarios to assess our ability to adjust to different population forecasts.

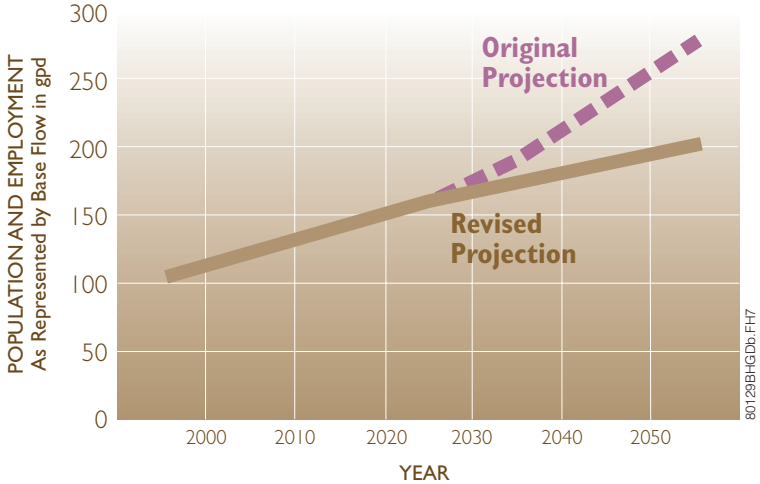

FIGURE 13 – Revised Sewered Population Projections

TABLE 4

Changes in Capital Facility Size and Phasing for Each RWSP Strategy Between May 1997 and April 1998

MAY 1997 (Draft Plan)	APRIL 1998
SERVICE STRATEGY 1 (Two Plants)	
West Treatment Plant upgrade by 2020 to 159 mgd	West Treatment Plant upgrade by 2029 to 159 mgd
East Treatment Plant upgrades in 2010, 2030, and 154 mgd	East Treatment Plant upgrades in 2013 and 2021 to 2040 to 235 mgd
Kenmore Pump Station upgrade by 2010	Kenmore Pump Station upgrade by 2010
Eastside Interceptor parallel by 2035	Limited Eastside Interceptor sections paralleled
SERVICE STRATEGY 2 (Three Plants)	
West Treatment Plant upgrade by 2010 to 159 mgd	West Treatment Plant upgrade by 2013 to 159 mgd
East Treatment Plant upgrades by 2023 and 2042 to 172 mgd	East Treatment Plant upgrades by 2029 to 127 mgd
North Treatment Plant upgrades by 2018 and 2032 to 65 mgd	North Treatment Plant built by 2024 at 27 mgd
Kenmore Interceptor parallel upgrade by 2003	Kenmore Pump Station upgrade by 2010
SERVICE STRATEGY 3 – EXECUTIVE'S PREFERRED PLAN (Three Plants/No West Treatment Plant Expansion)	
East Treatment Plant upgrades by 2020 and 2040 to 172 mgd	East Treatment Plant upgrade by 2020 to 135 mgd
North Treatment Plant upgrades by 2010, 2020, and 2030 to 89 mgd	North Treatment Plant built by 2010, and upgraded in 2030 and 2040 to 54 mgd
SERVICE STRATEGY 4 (Two Plants with Tunnel)	
West Treatment Plant upgrade by 2010 to 159 mgd	West Treatment Plant upgrade by 2013 to 159 mgd
East Treatment Plant upgrades by 2020, 2030, and 2040 to 235 mgd	East Treatment Plant upgrade by 2024 and 2037 to 154 mgd
Deep tunnel upgrades in 2005, 2010 and 2020	Deep tunnel upgrades in 2005, 2013 and 2025

This analysis is summarized in the *Regional Wastewater Services Plan Draft Financing Plan* (May 1997).

Additional information on population estimate methodology and changes in population growth can be found in two technical memoranda. The first is titled *Population Forecasts, Flow and Loading Projections Methodology Comparison*, King County Department of Natural Resources, Brown & Caldwell Consultants, March 1998; the second is titled *QA/QC of Revised Service Strategies*, King County Department of Natural Resources, Brown and Caldwell Consultants, 1998.

TABLE 5

Changes in Costs for Each RWSP Strategy Between May 1997 and April 1998 ($ millions)

STRATEGY	COSTS PRESENTED IN 1997 DRAFT RWSP	COSTS BASED ON REVISED POPULATION ESTIMATES[a]
Strategy 1	876	789
Strategy 2	1,128	1,027
Strategy 3 (Executive's Plan)	1,235	1,086
Strategy 4	1,398	1,218

[a] *For purposes of comparison, service strategy costs for 1, 2, and 4 were also adjusted according to other recommendations proposed by the Executive, including accelerating completion of the CSO program to 2030, adding $20 million (net present value) for water reuse, and eliminating the third outfall for the East Treatment Plant's Effluent Transfer System.*

April 1998

APPENDIX B

Wastewater Policies

Background

On April 22, 1959, the Municipality of Metropolitan Seattle (Metro) adopted its Comprehensive Sewage Disposal and Stormwater Drainage Plan (Metro Resolution No. 23). For the following 40 years, this Plan, which became the Comprehensive Water Pollution Abatement Plan, was amended many times until it was re-adopted by the Metropolitan King County Council by Ordinance No. 12074 on December 6, 1995. Since that date, the Comprehensive Water Pollution Abatement Plan has become a "functional plan" under King County's Comprehensive Plan. The Metropolitan King County Council further amended the Financial Policies by Motion No. 9869 on May 28, 1996.

To aid the Metropolitan King County Council and the Regional Water Quality Committee in the adoption of the Regional Wastewater Services Plan (an amendment to the Comprehensive Water Pollution Abatement Plan), the Department of Natural Resources consolidated the policies adopted in several Metro resolutions and King County ordinances. The majority of the consolidated existing policies were reviewed by King County's Regional Water Quality Committee in 1995 which sent three messages [RWQC 95-02 (6/9/95); 95-03 (6/9/95); and 95-04 (8/18/95)] to the Metropolitan King County Council highlighting specific wastewater services policies for consideration in the preparation of the Regional Wastewater Services Plan.

This appendix presents both existing and new wastewater policies according to the six wastewater elements and other related categories. These policies will need to be adopted by the Metropolitan King County Council in order to implement the Executive's Preferred Plan. Some of the existing policies have proposed revisions and updates for consistency with the Executive's Preferred Plan. These revisions are noted by underlining new language and crossing out language to be deleted.

Treatment Plant Policies (TPP)

Existing Policies

TTP-1: ~~The Water Pollution Control Division~~ King County shall provide secondary treatment to all base sanitary flow delivered to its treatment plants.

New Policies

TTP-2: King County shall provide additional wastewater treatment capacity to serve growing wastewater needs by constructing a new North Treatment Plant in north King County or south Snohomish County and then expanding the treatment capacity at the East Treatment Plant. The West Treatment Plant shall maintain its current capacity, retaining future capacity in reserve as a safeguard against unexpected circumstances which shall include, but not be limited to factors such as higher than anticipated population growth, new facilities to implement the combined sewer overflow reduction program, or new regulatory requirements.

TTP-3: Any improvements to the West Treatment Plant whether for additional CSO volumes, future water reuse options, or any other reason shall meet the terms of the West Point Settlement Agreement.

TTP-4: King County shall undertake studies to determine whether it is economically and environmentally feasible to discharge highly treated wastewater to Lake Washington or Lake Sammamish watersheds.

TTP-5: When there are opportunities to transfer flows between King County's facilities and facilities owned and operated by other wastewater utilities in the region, King County shall evaluate them. Such evaluation shall include, but not be limited to cost, environmental and community impacts, liability, engineering feasibility, flexibility, impacts to contractual and regulatory obligations, and consistency with the level of service provided at King County owned and operated facilities.

TTP-6: King County may explore the possibility of constructing one or more satellite treatment plants. King County may build these plants in cooperation with a local community and provide the community with high-quality reclaimed water through the regional water supply agency.

TTP-7: King County shall establish one or more committees to aid in the siting of a North Treatment Plant. The King County Executive may appoint these representatives, and at a minimum, they shall evaluate siting criteria to be used and a narrowed list of sites for consideration by the King County Executive.

TTP-8: A comprehensive public involvement program shall be developed and implemented to provide the public, at a minimum, the opportunity to give input on the criteria and the screening process used for selecting the list of possible sites for the new treatment plant, its conveyance system and outfall, as well as to provide comment on the final selection of a site.

TTP-9: The King County Executive shall have the final decision of which site will become the location for a North Treatment Plant.

Conveyance Policies (CP)

Existing Policies

There are no existing Conveyance Policies.

New Policies

CP-1: To protect public health and water quality, King County shall plan, design, and construct wastewater facilities to avoid sanitary sewer overflows. The 20-year design storm shall be used as the design standard for King County's separated wastewater system except for the Renton Effluent Transfer System (RETS) which shall be designed with a two-year design standard. When effluent volumes exceed the two-year design standard and exceed the capacity of the RETS, secondary treated effluent from the East Treatment Plant will be discharged to the Green/Duwamish River until the flow subsides such that the flow can be discharged through the RETS.

CP-2: King County shall construct the necessary wastewater infrastructure (pipelines, pumps, regulators, etc.) to convey wastewater to the treatment plants for treatment as well as convey treated effluent to waterbodies for discharge.

CP-3: King County shall evaluate assumptions used to size future conveyance facilities to allow for flexibility to convey future flows that may differ from present population projections or development patterns.

Inflow/Infiltration Policies (I/IP)

Existing Policies

I/IP-1: ~~A 20-year peak flow shall be the minimum design standard for conveyance capacity in the Water Control Division's separated system. Higher peak flow standards will be pursued when shown to be cost-effective or required by local agreement.~~

I/I-2: ~~The Water Pollution Control Division shall rehabilitate portions of its system to prevent~~ I/I ~~whenever the cost of rehabilitation is less than the costs of conveying and treating that flow.~~

I/I-3: ~~The Water Pollution Control Division shall work collaboratively with local agencies to reduce I/I into the conveyance system by providing information, technical advice cost-minimizing strategies and by developing an equitable funding strategy.~~

I/I-4: ~~The Water Pollution Control Division shall monitor component agency systems for inflow and infiltration in order to better identify long-term system operating and capital needs and aid in the equitable distribution of costs.~~

New Policies

I/IP-1: King County is committed to controlling I/I within its regional conveyance system and shall provide the resources necessary to ensure I/I levels remain within accepted standards.

I/IP-2: King County shall work collaboratively with local service providers to reduce I/I in local conveyance systems by providing regional focus, financial assistance, and technical support.

I/I-3: King County shall share the cost of assessing the current status of I/I in the local collection systems tributary to King County. These assessments shall be completed by 2003 and will define current I/I levels in local conveyance systems and establish cost effective removal levels.

I/I-4: King County shall commit through 2010 to share in the cost of correcting local system I/I that is judged to be cost effective to eliminate (less expensive to control locally than to transport and treat regionally) and of regional significance.

I/I-5: King County shall implement an excessive I/I surcharge by the year 2010 specifically designed to encourage local service providers to remove I/I that is cost effective to control locally and which unfairly burdens King County's regional facilities.

Combined Sewer Overflow Reduction Policies (CSORP)

Existing Policies

CSORP-1: ~~The Water Pollution Control Division shall plan to control CSO discharges and to work with state and federal agencies to develop cost-effective regulations that protect water quality. The Water Pollution Control Division shall meet current regulations and agreements, which are the following:~~

~~The Federal Water Pollution Control Act (Public Law 92-500) of 1972 and its amendments, NPDES Permit Requirements (No. WA-002918-1(m), S11.C.2, and Chapter 173-245 of the Washington Administrative Code. By agreement with the Washington State Department of Ecology, the Water Pollution Control Division will reduce the volume of CSOs by 75 percent (from baseline established in 1988) over the Water Pollution Control Division's entire service area by the year 2005.~~

King County shall plan to control CSO discharges and to work with state and federal agencies to develop cost-effective regulations that protect water quality. King County shall meet current regulations and agreements, such as the Federal Water Pollution Control Act (Public Law 92-500) of 1972 and its amendments; NPDES Permit Requirements (No. WA-002918-1(m), S11.C.2; and Chapter 173-245 of the Washington Administrative Code.

CSORP-2: ~~The Water Pollution Control Division shall give CSO discharges that can potentially impact human health the highest priority for control~~. King County shall give CSO discharges that have the highest potential to impact human health the highest priority for control.

CSORP-3: ~~The Water Pollution Control Division~~ King County shall participate with the City of Seattle in the Municipal Stormwater NPDES permit application process.

CSORP-4: Although ~~the Water Pollution Control Division's~~ King County's wastewater collection system is impacted by the intrusion of clean stormwater, conveyance and treatment facilities shall not be designed for the interception, collection and treatment of clean stormwater.

CSORP-5: To protect water quality, ~~the Water Pollution Control Division~~ King County shall accept stormwater runoff from industrial sources and shall establish a fee to capture the cost of transporting and treating this stormwater. ~~A permit~~ Specific authorization for such discharge is required.

CSORP-6: ~~The Water Pollution Control Division~~ King County, in conjunction with the City of Seattle, shall implement stormwater management programs in a cooperative manner that results in a coordinated joint effort and avoids duplicative or conflicting programs.

New Policies

CSORP-7: King County shall develop a long-range sediment management strategy to prioritize clean up of contaminated sediments at specific CSO locations.

CSORP-8: King County shall complete the CSO Water Quality Assessment in 1998 and will use its results to assess CSO projects and priorities prior to the issuance of the year 2000 *CSO Update*.

Biosolids Policies (BP)

Existing Policies

BP-1: ~~The Water Pollution Control Division~~ King County shall strive to achieve beneficial use of wastewater solids. A beneficial use can be any use that proves to be environmentally safe, ~~and~~ economically sound, and utilizes the advantageous qualities of the material.

BP-2: Biosolids derived products shall be used as a soil amendment in landscaping projects funded by King County.

BP-3: New and innovative technologies for wastewater solids processing, energy recovery, and beneficial uses brought forward by public or private interests shall be considered~~, along with King County or other public and private ownership of facilities.~~ King County shall seek to advance the beneficial use of wastewater solids, effluent, and methane gas through research and demonstration projects.

BP-4: ~~The Water Pollution Control Divison~~ King County shall seek to maximize program reliability and minimize risk by: (a) maintaining reserve capacity to manage approximately 150 percent of projected biosolids; (b) considering diverse technologies, end products, and beneficial uses; and/or (c) pursuing contractual protections including interlocal agreements, where appropriate.

BP-5: ~~The Water Pollution Control Division~~ King County shall produce and use wastewater solids within the stipulations of state and federal laws.

BP-6: ~~The Water Pollution Control Division~~ King County shall strive to produce the highest quality biosolids economically and practically achievable and ~~will~~ shall continue efforts to reduce trace metals in biosolids consistent with 40 CFR 503 pollutant concentration levels (exceptional quality) for individual metals. King County shall continue to provide Class B biosolids and explore technologies that will enable the County to generate Class A biosolids, cost-effectively or for better marketability. Future decisions shall be based on marketability of biosolids products.

BP-7: When biosolids derived products are distributed outside the ~~Water Pollution Control Division~~ King County wastewater service area, ~~the property owners~~ local sponsors using the products shall act as lead in securing any permits required by the local government body.

BP-8: ~~The Water Pollution Control Division~~ King County shall work cooperatively with statewide organizations on biosolids issues.

BP-9: ~~The Water Pollution Control Division~~ King County shall seek to minimize the noise and odor impact associated with processing, transporting and applying of biosolids, consistent with constraints of economic and environmental considerations and giving due regard to neighboring communities.

BP-10: Where cost-effective, King County shall beneficially use methane produced at the treatment plants for energy and other purposes.

~~**BP-11:** The Water Pollution Control Division shall seek to advance the beneficial use of wastewater solids through research and demonstration projects.~~ Deleted as included under BP-3.

~~**BP-10**: King County shall continue to beneficially reuse biosolids, make decisions based on marketability of biosolids product, and provide Class B biosolids~~. Deleted as included under BP-6.

New Policies

There are no new Biosolids Policies.

Water Reuse Policies (WRP)

Existing Policies

~~**WRP-1:** Recycled wastewater could provide a significant source of water supply for the region's non-potable uses, and could reduce the demand for fresh water supply. Therefore, the Regional Wastewater Services Plan shall include a plan for a water reuse program in keeping with the following:~~

- ~~The cost of making the supply of recycled water available should be borne by water users (suppliers), and sewer rate subsidies of these programs eliminated.~~
- ~~The Water Pollution Control Division's financial participation in the provision of recycled water should be equal to sewer system costs that are reduced or avoided due to the recycling program.~~
- ~~The Water Pollution Control Division shall actively participate in the development of water quality laws, standards and programs to ensure cost-effective maintenance or enhancement of environmental and public health.~~

New Policies

WRP-1: King County shall encourage the use of reclaimed water while protecting the health and safety of all citizens in the County and the protection of the environment. The County shall develop a reclaimed water program to help meet the goals of the County to preserve water supplies within the region and to ensure that any reclaimed water reintroduced back into the environment will protect the water quality of the receiving water body and the aquatic environment.

WRP-2: Recycling and reusing highly-treated reclaimed water shall be investigated by King County as a possible significant new source of water to enhance or maintain fish runs, supply additional water for the Region's non-potable uses, preserve environmental and aesthetic values, and defer the need to develop new potable water supply projects.

WRP-3: King County's Water Reuse Program and projects shall be coordinated with the regional water supply plans and regional basin plans, in accordance with State and Federal standards. King County recognizes that water reuse and water supply/resources must be developed in conjunction with each other to allow the most effective management of resources in the County.

WRP-4: Direct non-potable projects shall continue to be implemented on a case-by-case basis. To evaluate direct non-potable projects, King County shall develop criteria which may include, but are not limited to: cost, environmental benefits, fisheries habitat maintenance and enhancement potential, community and social benefits and impacts, public education opportunities, risk and liability, demonstration of new technologies, and enhancing economic development.

WRP-5: King County shall work with local water purveyors, when the local purveyors update their water comprehensive plans, to evaluate the opportunities for water reuse within their local service area.

WRP-6: King County shall develop a proactive reclaimed water public education and involvement program. This program shall be developed to correspond with the development of the Water Reuse Program and be coordinated with other water conservation education programs.

WRP-7: King County shall establish a forum or multiple forums to provide opportunities for coordination and communication with the Washington State departments of Health and Ecology (which have the State regulatory role in the planning, design, and construction of reuse facilities). King County shall involve other stakeholders, including but not limited to: the Corps of Engineers, Washington Department of Fish and Wildlife, National Marine Fisheries Service, US Fish and Wildlife Service, regional water suppliers, tribal governments, local water and wastewater districts, cities, local health departments, watershed forums, and environmental and community groups.

WRP-8: King County shall work, on a case-by-case basis, with the Washington State Departments of Health and Ecology on those types of water reuse projects which are not specifically cited in the 1997 Department of Health and Ecology Water Reclamation and Reuse Standards..

WRP-9: King County shall hold and maintain the exclusive right to any reclaimed water generated by the wastewater treatment plants owned and operated by King County.

WRP-10: The projects potentially planned under King County's Water Reuse Program shall not impair any existing water rights unless compensation or mitigation for such impairment is agreed to by the holder of the affected water rights.

WRP-11: King County shall retain the flexibility to produce and distribute reclaimed water at all treatment plants including retaining options to add additional levels of treatment.

WRP-12: King County shall continue to fund pilot-scale and water reclamation demonstration projects, in whole or in part, from the wastewater utility rate base.

WRP-13: King County shall complete an economic and financial feasibility assessment, including environmental benefits, when water reclamation projects other than pilot scale or demonstration projects are proposed. The economic analysis, with a scope consistent with the size of the project, shall include the assessment of marginal costs including stranded costs and benefits to estimate equitable cost splits between participating governmental agencies and utilities. The analysis shall also include a review of existing and planned water and wastewater facilities in an approved plan to ensure that reuse facilities are justified when any resulting redundant capacity is taken into account.

Financial Policies (FP)

Existing Policies

FP-1: The Water Quality Program will maintain a multi-year financial plan and cash-flow projection of six years or more, estimating service growth, operating expenses, capital requirements, reserves and debt service. The financial plan will be reviewed and adopted by the Council and used as a policy basis for budget and related financial planning.

FP-2: Bond covenants will set requirements that ensure a prudent budget standard. Net operating income (operating income minus operating expense) must exceed parity bond debt service requirements by at least 15 percent. The resulting balance on operations is available along with bond proceeds to cover annual capital expenditures. Staff will advise Council if either operating or capital expenditures are expected to exceed adopted levels.

FP-3: If the operations and maintenance component of the proposed annual budget increases by more than a reasonable cost of the addition of new facilities, increased flows, new programs authorized by the Council, and inflation, a feasible alternative spending plan will be presented, identifying steps to reduce cost growth. An alternative-spending plan will also be available in the event that actual revenues drop below prudent estimates. A program of reviewing business practices for savings and efficiency potential will be ongoing.

FP-4: Reserves needed for future liabilities, claims, and replacement will be reported in budget planning.

FP-5: To maintain sufficient funds to meet bond convenants for betterment reserves, requirements for cash flow and potential future liabilities, the water quality program will maintain a minimum cash balance of $5 million each year. This amount may be changed in budget planning and will be included in the annual Sewer Rate Explanation Report.

Sewer rates will be set at a level sufficient to meet the following financial policies (FP-6 to FP-9):

FP-6: *Debt Service Coverage*: Bond covenants require the ratio of net operating income to debt service to be 1.15. For rate-setting purposes, the policy is to target the ratio at a minimum of 1.25. Budgets will be planned and monitored against this 1.25 standard. This policy assures budgets are planned with a margin of error so that bond covenant agreements are met.

FP-7: *Emergency Reserves*: Bond covenants require three emergency funds. The Operating Reserve is required to have a balance the greater of $300,000 or five percent of total operating and maintenance costs and may be used for operating costs if sufficient revenues are not available. The Contingency Reserve is required to have a minimum balance of $2,000,000 and may be used for emergency repairs or unforeseen capital improvements. The Betterment Reserve is required to have a minimum deposit each year of $750,000 and may be used for emergency repairs, capital improvements in the Comprehensive Water Pollution Abatement Plan, replenishment of other reserves, and payment of outstanding parity bonds. Council approval shall be sought for any use of these funds.

FP-8: *Maintenance of the System*: Revenues will be sufficient to maintain capital assets in sound working condition, providing for maintenance and rehabilitation of facilities at a level intended to minimize total cost while continuing to provide reliable, high quality service and maintain high water quality standards.

FP-9: *Sewer Bond Covenant Provisions*: Covenants contained in Resolution No. 90 and subsequent resolutions authorizing issuance of bonds are hereby affirmed.

FP-10: King County will attempt to structure the term of its borrowings to match the expected useful life of the assets to be funded. The water quality capital program will be financed predominantly by

annual staged issues of long-term general obligation or parity bonds backed by sewer revenues, provided that:

- All available sources of grants are utilized;
- The balance on operations available after reserve requirements are met will be used for the capital program; any excess reserves may also be used for capital;
- Consideration is given to competing demands for use of King County's overall general obligation debt capacity; and
- Consideration is given to the overall level of debt financing that can be sustained over the long term given the size of future capital expenditures, potential impacts of credit ratings, and other relevant factors such as intergenerational rate equity and the types of projects appropriately financed with long-term debt.

FP-11: To achieve a better maturity matching of assets and liabilities, thereby reducing interest rate risk, short-term borrowing will be used to fund a portion of the capital program, provided that:

- Outstanding short-term debt comprises no more than 15 percent of total outstanding parity and general obligation bonds;
- Appropriate liquidity is in place to protect the day-to-day operations of the division.

FP-12: A report will be prepared in support of the proposed annual sewer rates, including the following information:

> *Key Assumptions*: Key financial assumptions such as inflation, bond interest rates, investment income, size and timing of bond issues, and the considerations underlying the projection of future growth in residential customer equivalents;
>
> *Significant Financial Projections*: All key projections, including the annual projection of operating and capital costs, debt service coverage, cash balances, revenue requirements, revenue projections, and a discussion of significant factors that impact the degree of uncertainty associated with the projections; and
>
> *Historical Data*: A discussion of consistent over or under projections of costs and revenues from previous recent budgets, and;
>
> *Policy Options*: Calculations and/or analyses of the effect of certain policy options on the overall revenue requirement. These options will include alternative capital improvement accomplishment percentages (including a 90 percent, a 95 percent, and a 100 percent accomplishment rate), and that rate will be selected which most accurately matches historical performance for capital projects and which will not negatively impair the bond rating.

FP-13: Water quality services performed for a fee for other public or private organizations will be reimbursed to recover all direct and indirect costs of the service unless otherwise directed by council. The Department Director may waive this policy in specific circumstances where recovery of all direct and indirect expenses may interfere in the wastewater program goals or mission.

- King County should periodically review the sewage treatment capacity charge to ensure that the true costs of system expansion are reflected in the assessed charge. All reasonable steps should be taken to coordinate fee assessments and accounting with local sewer service providers to reduce redundant program overhead costs.

- ~~Selective monitoring should be increased for inflow and infiltration system flows of component agencies. While this may not have an immediate financial impact, it could better identify long-term system operating and capital needs, and could aid in the equitable distribution of costs.~~ **See new policies on I/I reduction.**

- As a program policy, King County will continue its long-standing commitment to research and development funding at least at current functional levels.

- Expenditures from the Water Quality Program budget on behalf of septic systems will be conducted only if financially beneficial to sewer customers.

- King County will attempt to adopt a multi-year sewer rate to provide stable costs to ~~Water Pollution Control customers~~ sewer customers. If a multi-year rate is established, a rate stabilization reserve account will be created to ensure that adequate funds are available to sustain the rate through completion of the rate cycle. Funds will not be removed from this rate stabilization account without prior review of the Regional Water Quality Committee.

- King County will prepare explicit policies for the setting of customer rates, in consultation with the Regional Water Quality Committee, for adoption into future budget policies by the Metropolitan King County Council.

FP-14: ~~The customers of the Water Pollution control sewer system~~ Sewer customers will pay their pro rata share of the cost of the system which serves them. To implement this policy:

- A capacity charge is levied against new connections, reconnections, or establishment of a new service. This charge is intended to ensure that excess capacity built into the system to serve future customers is paid for by these new customers. ~~to pay for the capital cost of excess capacity that has already been built to serve future customers.~~ The charge is currently set at the maximum amount permitted by state law. King County shall pursue changes in state law to attain greater flexibility in setting capacity charges in order to ensure that new growth will pay an equitable portion of the costs of expanding system capacity.

- Based on an analysis of residential construction patterns, ~~Water Pollution *Control*~~ King County currently uses a value of 750 cubic feet per month to convert water consumption of volume-based customers to residential customer equivalents for billing purposes. King County will periodically review the appropriateness of this value to ensure that all accounts pay their fair share of the cost of the sewer system.

FP-15: Water quality activities, programs and projects, in addition to those that are functions of sewage treatment, may be eligible for funding assistance from sewer rate revenues as may be recommended by the Regional Water Quality Committee after consideration of criteria and limitations suggested by the Metropolitan Water Pollution Abatement Advisory Committee, and will be limited to 1.5 percent of the annual ~~Water Quality Program's~~ Wastewater ~~annual~~ operating budget. This policy will remain in effect until such time as a financial plan for the Surface Water Regional Needs Assessment is developed.

FP-16: The calculation of general government overhead to be charged to the wastewater fund will be based on a methodology which provides for the equitable distribution of overhead costs throughout Metropolitan King County government. Estimated overhead charges will be calculated in a fair and consistent manner, utilizing a methodology that best matches the estimated cost of the services provided to the actual overhead charge. The overall allocation formula and any subsequent modifications will be reported to the Regional Water Quality Committee.

FP-17: The assets of the water quality fund are pledged to be used for the benefit of the sewer system including operating expenses, debt service payments and capital improvements associated therewith. The fund will be fully reimbursed for the costs associated with any use or transfer of such assets for

other county government purposes. The Executive will provide reports to the Regional Water Quality Committee pertaining to any significant transfers of assets for other county government purposes in advance of and subsequent to any such transfers.

New Policies

FP-18: King County shall charge its customers rates sufficient to cover the costs of constructing, operating and maintaining its facilities and services and shall strive to maximize other sources of revenue.

Wastewater Services Policies (WWSP)

Existing Policies

WWSP-1: ~~The Water Pollution Control Division~~ King County shall provide wastewater services to fulfill the contractual commitments to its component agency customers in a manner that promotes environmental stewardship, recognizes the value of wastewater in the regional water resource system, and reflects a wise use of public funds.

WWSP-2: ~~The Water Pollution Control Division~~ King County shall ~~should~~ continue to establish ~~government-to-government (e.g. tribal)~~ tribal relations as appropriate and structure processes for joint water quality stewardship.

WWSP-3: ~~The Water Pollution Control Division~~ King County shall not accept additional wastewater directly from private facilities within the boundaries of a local public agency without the prior written consent of such local public agency.

WWSP-4: ~~The Water Pollution Control Division's~~ King County's service area generally has been developed along those boundaries defined in the original *Metropolitan Seattle Sewerage and Drainage Survey*, which was adopted as ~~The Water Pollution Control Division's~~ King County's wastewater comprehensive plan and amended. ~~The Water Pollution Control Division's~~ King County's service area is, specifically, an aggregation of the service areas of the local governments with whom a sewage disposal agreement has been established (Agreement for Sewage Disposal, Section 2.). ~~The Water Pollution Control Division's~~ King County's service area boundary is therefore coincident with the perimeter of this aggregation, and shall not exceed the Urban Growth Boundary for King County and the portion of sewer service provided to Snohomish County and Pierce County within ~~that~~ those ~~County's~~ Counties Urban Growth Boundar~~y~~ies.

WWSP-5: Proposed extensions to an existing interceptor owned by ~~the Water Pollution Control Division~~ King County must be consistent with King County's land use plans and policies, and certified by potentially affected land use jurisdictions as consistent with their adopted land use plans and policies.

WWSP-6: ~~The Water Pollution Control Division~~ King County shall operate and maintain its facilities to protect public health and the environment, comply with regulations, and improve services in a fiscally responsible manner.

WWSP-7: ~~The Water Pollution Control Division~~ King County shall plan, design and construct wastewater facilities in accordance with standards established by regulatory agencies and manuals of practice for engineering.

WWSP-8: ~~The Water Pollution Control Division~~ King County facilities shall be constructed, operated, and maintained to prevent raw sewage overflows and to contain overflows in the combined collection system. In the event of a raw sewage overflow, a rapid and coordinated response including notification of public health agencies, the media, the public, and the affected jurisdiction shall be initiated. Preserving water quality and public health shall be the top priority, to be implemented by immediately initiat-

ing repairs or constructing temporary diversion systems that return flow back to the wastewater system.

WWSP-9: To ensure the region's multi-billion dollar investment in wastewater facilities, ongoing maintenance and repair shall be a high priority of ~~the Water Pollution Control Division~~ King County. The Wastewater Treatment Division's maintenance budget, staffing levels and priorities shall be developed to reflect the long-term useful life of wastewater facilities.

WWSP-10: ~~The Water Pollution Control Division~~ King County King County shall establish a ~~five-year Capital~~ Facilities Assets Management Plan, updated annually, establishing replacement of worn, inefficient and/or depreciated capital assets to ensure continued reliability of the wastewater infrastructure.

WWSP-11: ~~To ensure worker, public and system safety, the Water Pollution Control Division~~ King County shall design, construct, operate, and maintain its facilities to meet or exceed regulatory requirements for air, water and solids emissions as well as to ensure worker, public and system safety.

.**WWSP-12:** ~~The Water Pollution Control Division~~ King County shall accept sewage, septage and biosolids from outside its service area provided that it is consistent with the King County Comprehensive Plan, capacity is available and no operating difficulties are created. King County will establish a rate to recover costs from accepting sewage, septage and biosolids from outside its service area.

WWSP-13: ~~The Water Pollution Control Division shall transport, treat and dispose/recycle sewerage within those portions of the Lake Washington and Lower Green River basins in the Urban Growth Area in a reliable and cost-efficient manner.~~ Deleted as covered under other policies.

~~**WWSP-14:** The Water Pollution Control Division shall provide water pollution abatement service for areas within the Urban Growth Area when such areas can be feasibly served under the terms, conditions and rates established by the King County Council.~~

New Policies

There are no new Wastewater Services Policies.

Water Quality Protection Policies (WQPP)

Existing Policies

WQPP-1: ~~The Water Pollution Control Division~~ King County shall participate in identifying and resolving water quality issues pertaining to public health and ecosystem protection in the region to ensure that the public's investment in wastewater facilities and water resource management programs is protected.

WQPP-2: ~~The Water Pollution Control Division~~ King County shall evaluate the impacts and benefits of actions that affect the quality of the region's waters and identify measures to meet and maintain water quality standards.

WQPP-3: ~~Forecast future aquatic resource conditions that may affect wastewater treatment decisions and work collaboratively to identify cost-effective alternatives to mitigate water quality problems and enhance regional water quality.~~ King County shall forecast future aquatic resource conditions that may affect wastewater treatment decisions and work cooperatively to identify cost-effective alternatives to mitigate water quality problems and enhance regional water quality.

WQPP-4: ~~The Water Pollution Control Division~~ King County shall participate with its regional partners to identify methods, plans and programs to enhance water quality and water resources in the region.

WQPP-5: ~~The Water Pollution Control Division~~ King County shall share and make publicly available water quality information resulting from water resource sampling, monitoring, analysis and other Department of Natural Resources ~~Division~~ research activities.

WQPP-6: ~~To support the National Pollutant Discharge Elimination System (NPDES) and other permit applications, and ensure permit compliance, the Water Pollution Control Division shall implement and maintain water quality, monitoring, evaluating and reporting programs.~~

King County shall implement and maintain water quality, monitoring, evaluating and reporting programs to support the National Pollutant Discharge Elimination System (NPDES) for wastewater and other permit applications, and ensure permit compliance.

WQPP-7: ~~The Water Pollution Control Division~~ King County shall actively participate in the development of water quality laws, standards and program development to ensure cost-effective maintenance or enhancement of environmental and public health.

WQPP-8: ~~The Water Pollution Control Division~~ King County shall assess the risk to human health and the environment from wastewater treatment and conveyance activities, and use this information in evaluating water pollution abatement control options.

WQPP-9: ~~The Water Pollution Control Division will disseminate information and provide education to the general public, private sector, and governmental agencies regarding the status, needs and potential futures of the region's water resources.~~ Deleted as covered under public involvement.

New Policies

There are no new Water Quality Protection Policies.

Wastewater Planning Policies (WWPP)

Existing Policies

WWPP-1: ~~The Water Pollution Control Division~~ King County shall plan comprehensively to provide for the design and construction of facilities that meet the wastewater system needs of the service area and shall coordinate with other local jurisdictions to ensure that construction-related disruption to neighborhoods is minimized.

WWPP-2: In planning future treatment systems, ~~the Water Pollution Control Division~~ King County shall make a long-term assessment of wastewater treatment needs.

WWPP-3: The comprehensive plan (Regional Wastewater Services Plan) shall provide a framework for the allocation of capital funds.

WWPP-4: In planning for facilities, ~~the Water Pollution Control Division~~ King County shall work collaboratively with other jurisdictions and look for opportunities to achieve cost savings.

WWPP-5: Facility sizing shall take into account the need to accommodate build-out population.

New Policies

WWPP-6: King County shall monitor conditions that could affect the plan and "check in" at key points during implementation to ensure that decisions are appropriate. Conditions to be monitored shall include but not be limited to population growth, development in new technologies, regulations, environmental conditions, and public opinion.

WWFPP-7: King County shall actively solicit and incorporate public opinions throughout the implementation of its wastewater plan.

Environmental Mitigation Policies (EMP)

Existing Policies

EMP-1: ~~In developing mitigation for environmental impacts created by the operation, maintenance, expansion or replacement of sewage conveyance, treatment and disposal facilities, mitigation measures shall be:~~

- ~~Causally related to these actions.~~
- ~~Related to specific adverse environmental impacts on the Water Pollution Control Division's proposed actions, and to impacts identified in the Water Pollution Control Division's environmental documents.~~
- ~~Reasonable, and although expenditures for mitigation need not be strictly proportional to the impacts, cost is recognized as a factor in determining reaasonableness.~~

King County shall work with affected communities to develop mitigation measures for environmental impacts created by the construction, operation, maintenance, expansion or replacement of wastewater conveyance, treatment, and disposal facilities. These mitigation measures shall:

- Address the adverse environmental impacts caused by the project
- Address the adverse environmental impacts identified in King County's environmental documents; and
- Be reasonable in terms of cost and magnitude as measured against severity and duration of impact.

EMP-2: Mitigation measures identified through the SEPA process shall be incorporated into design plans and construction contracts to ensure full compliance.

New Policies

EMP-3: The siting process and mitigation for new facilities shall be consistent with the Growth Management Act and the State Environmental Policy Act, as well as the requirements and conditions established by the jurisdictions governing the permitting process.

EMP-4: King County shall mitigate the long-term and short-term impacts for wastewater facilities in the communities in which they are located. The County's goal is to construct regional facilities that enhance the quality of life in the region and in the local community, and are not detrimental to the quality of life in their vicinity. Mitigation as it is used in this policy is as defined in SEPA (WAC 197-11-768).

Public Involvement Policies (PIP)

Existing Policies

PIP-1: ~~The Water Pollution Control Division~~ King County shall maintain public information/ education programs and engage the public and component agencies of local sewer service in the planning, designing, and operating decisions affecting them.

PIP-2: Public information and education programs shall be developed to support ~~the Water Pollution Control Division~~ King County wastewater programs, and ~~will~~ shall lay the groundwork for public understanding of and involvement in specific ~~Departmental~~ Department of Natural Resources programs.

PIP-3: ~~The Water Pollution Control Division~~ King County shall involve public officials and citizens of affected jurisdictions early and actively in the planning and decision-making process for capital projects.

PIP-4: Affected residents and businesses shall be informed in advance of capital construction projects. ~~Every reasonable effort shall be made to mitigate identified impacts.~~

~~**PIP-5**: **Citizens' Water Resources Advisory Committee. Purpose:** A standing citizen advisory committee shall act in an advisory capacity to the King County Executive and Council on matters concerning water resource issues, and shall have a strong role in Water Pollution Control Division planning activities.~~

New Policies

PIP-5: King County shall disseminate information and provide education to the general public, private sector, and governmental agencies regarding the status, needs and potential futures of the region's water resources.

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