INTRODUCTION

2.1 PROJECT DESCRIPTION

2.1.1 Purpose and Scope

Currently, King County (County) is unable to consistently meet the combined sewer overflow (CSO) control objective as defined by the State of Washington and as described in the 2008 *CSO Control Plan Update* (King County, June 2008). To address this problem, the County needs to make improvements to County infrastructure in the North Beach Basin (illustrated in Figure 2.1). The Barton, Murray, Magnolia, and North Beach CSO Facilities Project was initiated to identify improvements needed to meet the County's CSO control requirements. This report presents the "Facility Plan" for the North Beach Basin developed as a result of this work.

2.1.2 Problem Description

The North Beach Pump Station conveys wastewater from the North Beach Basin to the Carkeek Pump Station. From there it is pumped to the West Point Treatment Plant. The capacity of the North Beach Pump Station and Force Main limits the peak flow rate that can be conveyed downstream to approximately 3 million gallons per day (mgd), but the current 1-year peak wet-weather flow (PWWF) through the combined sewer system upstream of the North Beach Pump Station is approximately 9.6 mgd, well in excess of this limit.

Flows in excess of 3 mgd overflow the system's fixed weirs into the existing outfalls that empty into Puget Sound. There were an average of 10 such overflows annually from 1991 to 2009, with an average annual total overflow of 2.2 million gallons. According to the Combined Sewer Overflow Control Program's 2009 *Annual Report* (King County, July 2010), there were 14 overflow events totaling 966,000 gallons in 2009. That year's weather was characterized by several small storms that caused small overflows, and a few large storms that produced the bulk of the overflow volume.

2.1.3 Project Goal

The goal of the Barton, Murray, Magnolia and North Beach CSO Facilities Project is to develop facility plans to meet the CSO control objective - reduce overflows to no more than one event per year on a long-term average.

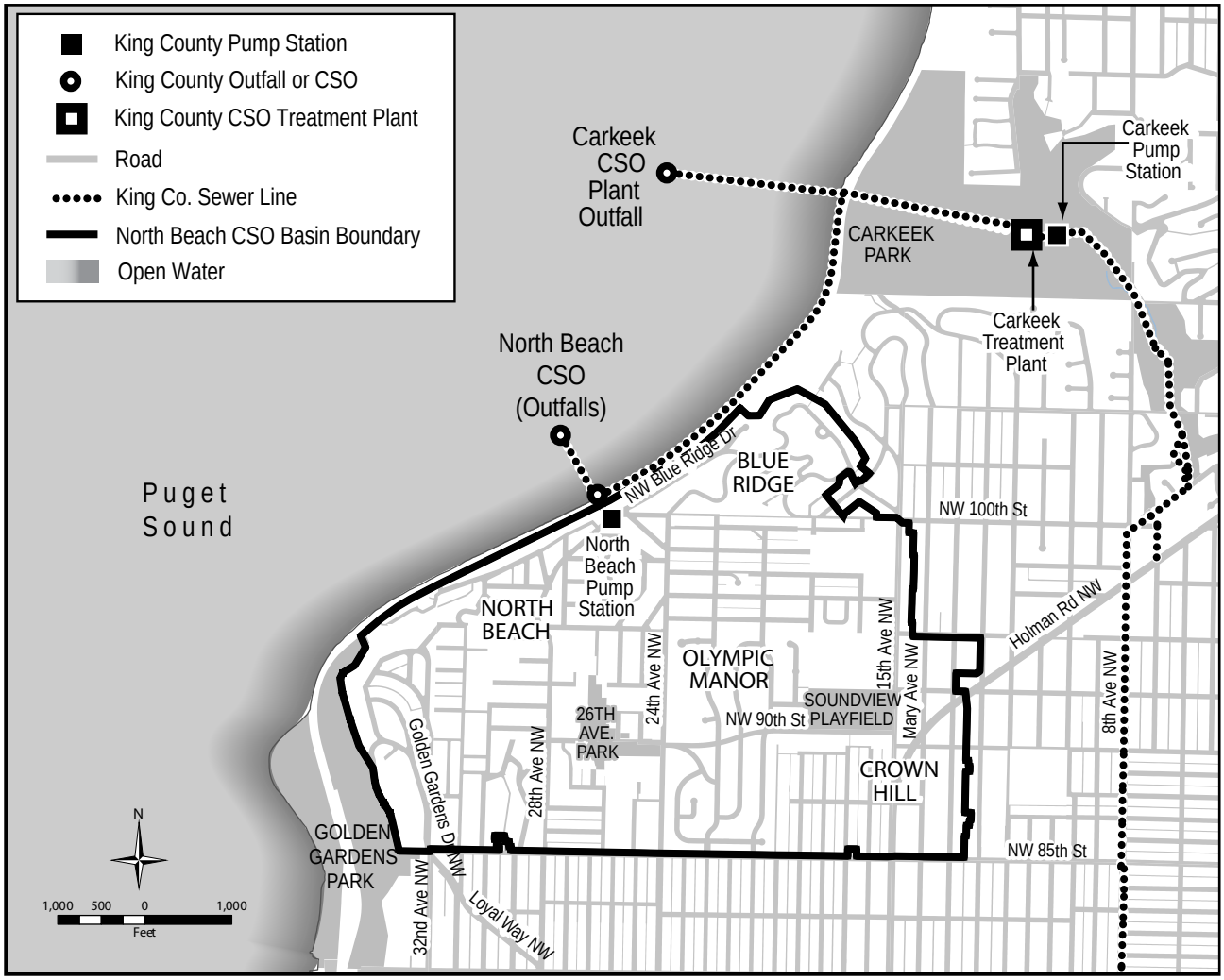

Figure 2-1.ai

Figure 2.1
NORTH BEACH BASIN

King County
Department of Natural Resources and Parks
Wastewater Treatment Division

2.2 FACILITY PLAN REQUIREMENTS

This Facility Plan has been prepared in the format required by the Washington Administrative Code (WAC) 173-240-060, and the requirements of the State of Washington, *Criteria for Sewage Works Design* (also known as "the Orange Book") (Washington State Department of Ecology, August 2008). The requirements of these two documents are presented in Table 2.1. The chapter where those requirements are addressed in this Facility Plan are also presented in Table 2.1.

2.3 CONTACT INFORMATION

The owner of this project is King County. The project representative is:

Shahrzad Namini, Project Manager
King County Department of Natural Resources and Parks
Wastewater Treatment Division
King Street Center
KSC-NR-0507
201 S. Jackson St.
Seattle, WA 98104-3855
shahrzad.namini@kingcounty.gov
(206) 263-6038

Table 2.1 Facility Plan Requirements

WAC 173-240-060 Requirement	Location Addressed
• The name, address, and telephone number of the owner of the proposed facilities, and the owner's authorized representative.	Chapter 2
• A project description that includes a location map and a map of the present and proposed service area.	Chapter 2
• A statement of the present and expected future quantity and quality of wastewater, including any industrial wastes that may be present or expected in the sewer system.	Chapter 4
• The degree of treatment required based upon applicable permits and rules, the receiving body of water, the amount and strength of wastewater to be treated, and other influencing factors.	Chapters 2 and 4
• A description of the receiving water, applicable water quality standards, and how water quality standards will be met outside any applicable dilution zone.	Chapters 2, 3, and 4
• The type of treatment process proposed, based upon the character of the wastewater to be handled, the method of disposal, the degree of treatment required, and a discussion of the alternatives evaluated and the reasons they are unacceptable.	Chapters 4, 5, and 6
• The basic design data and sizing calculations of each unit of the treatment works, expected efficiencies of each unit and also of the entire plant, and anticipated effluent character.	Chapters 4, 5, and 6
• Discussion of the various sites available and the advantages and disadvantages of the site or sites recommended. The proximity of residences or developed areas to any treatment plant site and the various plant units.	Chapter 5
• A flow diagram that shows the general layout of the various units, the location of the effluent discharge, and a hydraulic profile of the system that is the subject of the facility plan and any hydraulic related portions.	Chapter 6
• A discussion of infiltration and inflow problems, overflows and bypasses, and proposed corrections and controls.	Chapters 4 and 5

Table 2.1 Facility Plan Requirements

• A discussion of any special provisions for treating industrial wastes, including any pretreatment requirements for significant industrial sources.	Not Applicable
• Detailed outfall analysis or other disposal method selected.	Not Applicable
• A discussion of the method of final sludge disposal and any alternatives considered.	Not Applicable
• Provisions for future needs.	Chapter 6
• Staffing and testing requirements for the facilities.	Chapter 6
• An estimate of the cost and expenses of the proposed facility and the method of assessing these costs and expenses. The total amount shall include both capital and operations and maintenance costs for the life of the project, and must be presented in terms of the total annual cost and present worth.	Chapter 7
• A statement regarding compliance with any applicable state or local water quality management plan or any plan adopted under the Federal Water Pollution Control Act as amended.	Chapter 9
• A statement regarding compliance with the State Environmental Policy Act (SEPA) and the National Environmental Policy Act (NEPA), if applicable.	Chapters 6 and 9
Orange Book Requirement	**Location Addressed**
• Well documented site description, problem identification, and map.	Chapter 2
• Well documented description of discharge standards.	Chapter 2
• Background information including:	
– Existing environment (water, air, sensitive areas, flood plains, shore lands, wetlands, endangered species/habitats, public health, prime or unique farmland, archaeological and historical sites, any federally recognized “wild and scenic rivers,” threatened species).	Chapters 3 and 6

Table 2.1 Facility Plan Requirements

Orange Book Requirement	Location Addressed
– Demographic and land use (current population, present wastewater treatment, advanced wastewater treatment need evaluated, infiltration and inflow (I/I) studies, CSOs, sanitary surveys for unsewered areas, determination that I/I is not excessive).	Chapters 3 and 4
• Future conditions, including appropriateness of population data source, zoning changes, future domestic and industrial flows, and flow reduction options, future flows and loading, reserved capacity, future environment without project, discussion of whether recreation and open space alternatives could be incorporated.	Chapter 4
• Alternatives: list of specific alternative categories, including no action, collection system alternatives, sludge management/use alternatives, flow reduction, costs, environmental impacts, public acceptability, rank order, recommended alternative, description of innovative and alternative technologies.	Chapter 5
• Final recommended alternative: site layout, flow diagram, sizing, environmental impacts, design life, sludge management, ability to expand, O&M/staffing needs, design parameters, feasibility of implementation.	Chapter 6
• Financial Analysis: costs, user charges, financial capability, capital financing plan, implementation plan.	Chapters 7 and 8
• Other:	
– Conformance to water quality management plan.	Chapter 9
– SEPA approval, list required permits, environmental issues analysis.	Chapters 6, 8 and 9
– SERP compliance.	Chapter 9
– Documentation that the project is identified in a sewer general plan.	Chapters 2 and 9
– Capital improvement plan.	Chapter 7
– Documentation of adequate public involvement process.	Chapter 9

2.4 CSO CONTROL REQUIREMENTS

Amendments to the Federal Water Pollution Control Act, also known as the "Clean Water Act," or "CWA," were passed in 1972 and later expanded in 1977 and 1987. The purpose of this body of law is to "restore and maintain the chemical, physical, and biological integrity of the Nation's waters" (33 CFR 26.I§1251(a)). This objective translates into two overarching goals: 1) to eliminate the discharge of pollutants into the nation's waters, and 2) to achieve and maintain fishable and swimmable waters. The first goal, elimination of pollutant discharge, is met, in part, through the National Pollutant Discharge Elimination System (NPDES) permitting program. The second goal, restoration and maintenance of water quality, is being addressed by developing pollution control programs to meet specific water quality standards for specific water bodies.

The CWA requires all wastewater treatment facilities and industries that discharge effluent into surface waters to have NPDES permits. In Washington State, NPDES permits are issued by the Washington State Department of Ecology (Ecology). These permits define appropriate technology controls and specify limits on the allowed quality and quantity of effluent discharged from point sources such as treatment plants, CSOs, and industrial facilities.

CSOs were recognized by Ecology in the early 1980s as a unique category of discharge that was not adequately covered by existing federal or state regulations.

In 1984, Ecology introduced legislation requiring agencies with CSOs to develop plans for "the greatest reasonable reduction [of CSOs] at the earliest possible date." In January 1987, Ecology published a new regulation (WAC 173-245) that defined the greatest reasonable reduction in CSOs as: "control of each CSO such that an average of one untreated discharge may occur per year." This new regulation also defined standards for treated CSOs, which were essentially technology standards. Water quality standards allow a once-per-year

Regulations that Affect CSO Control Planning

Clean Water Act (CWA)—Adopted in 1972 (and expanded in 1977 and 1987) to eliminate the discharge of pollutants into the nation's waters and to achieve and maintain fishable and swimmable waters.

National Pollutant Discharge Elimination System (NPDES)—The Washington State Department of Ecology (Ecology) implements the CWA by issuing NPDES permits to wastewater agencies and industries that discharge effluent (including combined sewer overflows, or CSOs) to water bodies.

Water Quality Standards—To implement the CWA, Ecology has developed biological, chemical, and physical criteria to assess a water body's health and to impose NPDES permit limits accordingly.

State CSO Control Regulations—Ecology requires agencies to develop plans for controlling CSOs at the earliest possible date, so only an average of one untreated discharge per year occurs at each location.

Wet Weather Water Quality Act of 2000 (based on the CSO Control Policy)—The U.S. Environmental Protection Agency (EPA) requires agencies to implement "Nine Minimum Controls," and to develop long-term CSO control plans.

Sediment Quality Standards—Ecology developed chemical criteria to characterize healthy sediment quality and identified a threshold for sediment cleanup.

Endangered Species Act (ESA)—Three fish species that use local water bodies where CSOs occur have been listed as threatened under the ESA.

exemption from the mixing zone standards for "one untreated discharge" from CSO treatment facilities. Water quality based effluent limits also apply to treated CSO discharges where determined needed by Ecology.

The United States Environmental Protection Agency's (US EPA's) 1994 CSO Control Policy was codified as the Wet Weather Water Quality Act of 2000 (H.R. 4577, 33 U.D.C. 1342(q)). This act requires implementation of "Nine Minimum Controls" for CSOs and the development of long-term CSO control plans. The purpose of the Nine Minimum Controls is to implement early actions that can improve water quality before the protracted and more expensive capital projects in a control plan are built. EPA has determined that the Nine Minimum Controls are equal to the Best Available Technology (BAT). Agencies must show that water quality standards are met after implementation of their CSO control plan. The requirements of this act are incorporated in the NPDES permit for the West Point Treatment Plant.

2.5 CSO CONTROL PROGRAM OVERVIEW

In 1958, the Municipality of Metropolitan Seattle (Metro) was formed to clean up the waters of Lake Washington and the Seattle waterfront. In the 1960s, Metro assumed ownership of the City of Seattle's wastewater treatment plants and portions of its sewer system. It built large pipes, called interceptors, to carry regional wastewater from local systems to the treatment plants. In 1994, King County assumed Metro's responsibilities for regional wastewater management. In most of the Seattle area, wastewater and stormwater were combining in one conveyance system. The regional improvements in collecting, conveying, and treating wastewater that were made after the formation of Metro continue to be effective, even as the population and regional development have grown dramatically over the intervening decades.

In response to the Clean Water Act of 1972, Metro adopted the Combined Sewer Overflow Control Program in 1979. Since adoption of this first program, Metro, and then King County, have modified their CSO plans as CSO regulations have evolved and changed, including Ecology's current control standard of no more than one untreated discharge per year on average at each CSO location.

Strategies for reducing or mitigating the effects of CSOs include: pollution prevention through source control, stormwater management, operational controls that transfer as much CSO flow as possible to regional treatment plants, upgrades of existing facilities, and construction of CSO control facilities.

Construction of CSO control facilities in the region began in the late 1970s. Figure 2.2 illustrates the positive impact these CSO control efforts have had on sewer overflows. Since 1988, when systematic monitoring and measuring of CSO flows began, CSO volumes have dropped by more than half due to various improvement projects, from an estimated 2.4 billion gallons per year to approximately 900 million gallons per year.

So far, about $360 million (in 2008 dollars) has been spent by the County to control CSOs. Another $400 million in expenditures is planned to implement the CSO control projects in the long-term control plan approved in 1999 as part of the County's Regional Wastewater

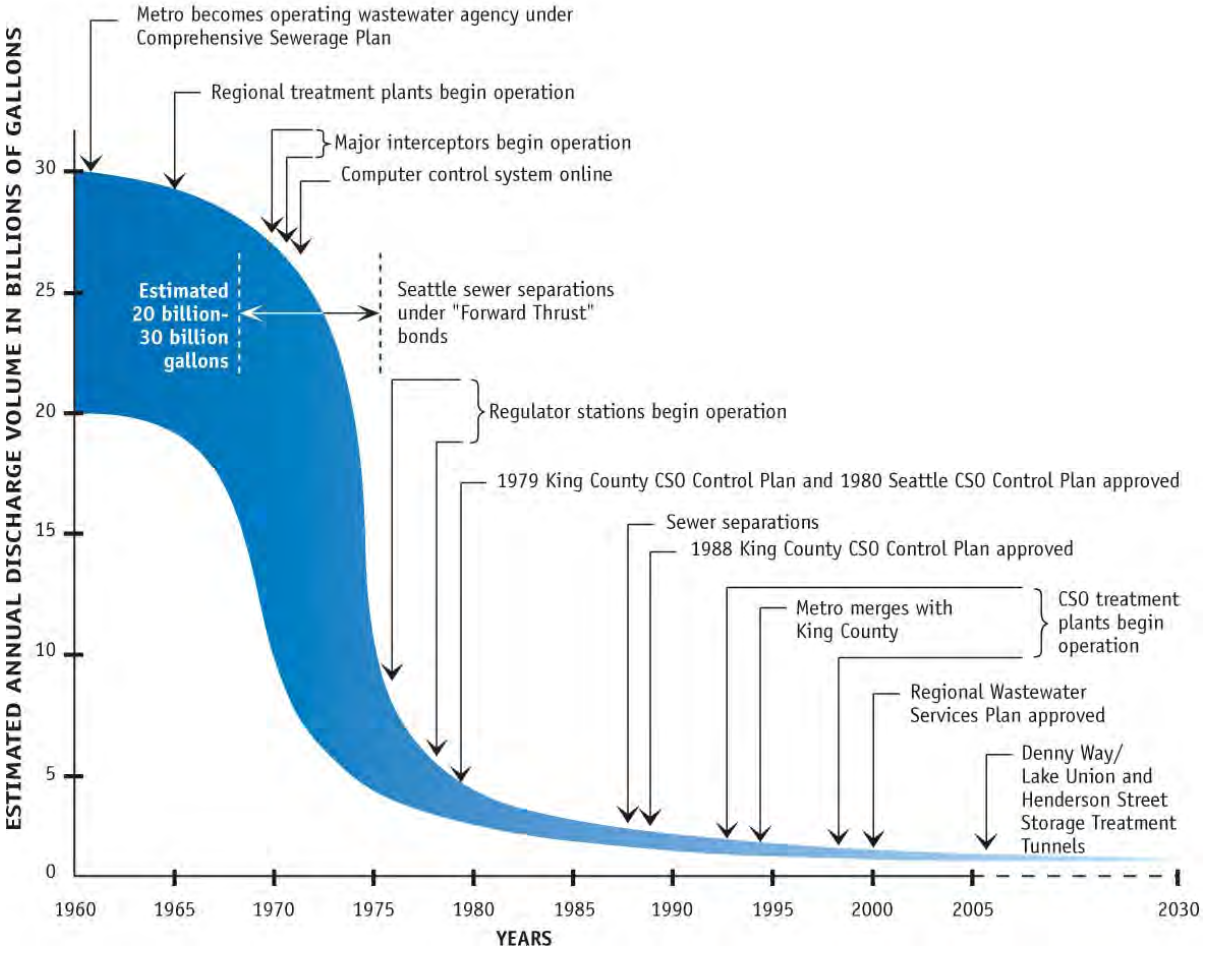

Figure 2.2
KING COUNTY CSO CONTROL PROGRAM OVERVIEW

King County
Department of Natural Resources and Parks
Wastewater Treatment Division

Figure 2.2.ai

DRAFT – December 2010

Services Plan (RWSP). Many early projects involved sewer separation, flow diversion, and construction of storage tunnels. Most current and future CSO projects involve the construction of conveyance improvements, storage tanks, and treatment facilities.

The most recent update to the King County CSO Control Program is described in the 2008 *CSO Control Plan Update* (King County, June 2008) and in the Regional Wastewater Services Plan (2008 Annual Report).

Control facilities that were under construction prior to RWSP adoption - the Mercer/Elliott West and the Henderson/Norfolk CSO control systems - were brought on-line in 2005. Now, based on the last seven years of monitoring, 13 of King County's 38 CSOs are controlled to Ecology's standard. The control status at five more CSO sites where projects have been completed will be assessed after the facilities have operated a sufficient number of years. The remaining 20 uncontrolled CSOs will meet state standards as capital improvement projects are completed between 2013 and 2030.

The North Beach CSO control project is one of four Priority 1 projects, as shown in Figure 2.3 (RWSP Annual Update, September 2009). (Note: The SW Alaska project was removed from the priorities list subsequent to the 2008 update as this CSO is now adequately controlled as a result of the Alki Transfer Project.) The CSO projects after Mercer/Elliott West and Henderson/Norfolk given the highest priority were at locations with recreational uses, such as swimming, where direct human contact with the water is likely to occur. Priorities for future projects may change based on upcoming CSO Program reviews and updates.

2.6 PREVIOUS STUDIES

King County and its predecessor agency, Metro, have consistently relied on scientific information to inform their wastewater management decisions. When information has not been available, they have initiated or participated in special studies to develop the needed data. This section describes the foundational studies that have shaped King County's decisions on CSO control.

2.6.1 1958 Metropolitan Seattle Wastewater and Drainage Study

Beginning with the 1958 *Metropolitan Seattle Wastewater and Drainage Study*, regional agencies have collaborated on studies to identify major environmental protection needs, and to identify and prioritize corrective actions. This study recognized that providing better wastewater management would result in the most environmental improvement. As part of a larger three-stage schedule of projects, this study recommended a program of sewer separation and storage, as needed, to control overflows in the City of Seattle.

2.6.2 1978 Area-wide Section 208 Water Quality Plan

In the late 1970s, Metro completed a two-year water quality investigation under Section 208 of the CWA. Toxic chemicals were identified as one of the five main water quality problems facing the Seattle-King County region. The plan recommended CSO control as part of improved wastewater management, and identified the need for more understanding of the toxic impacts of CSOs on the local environment.

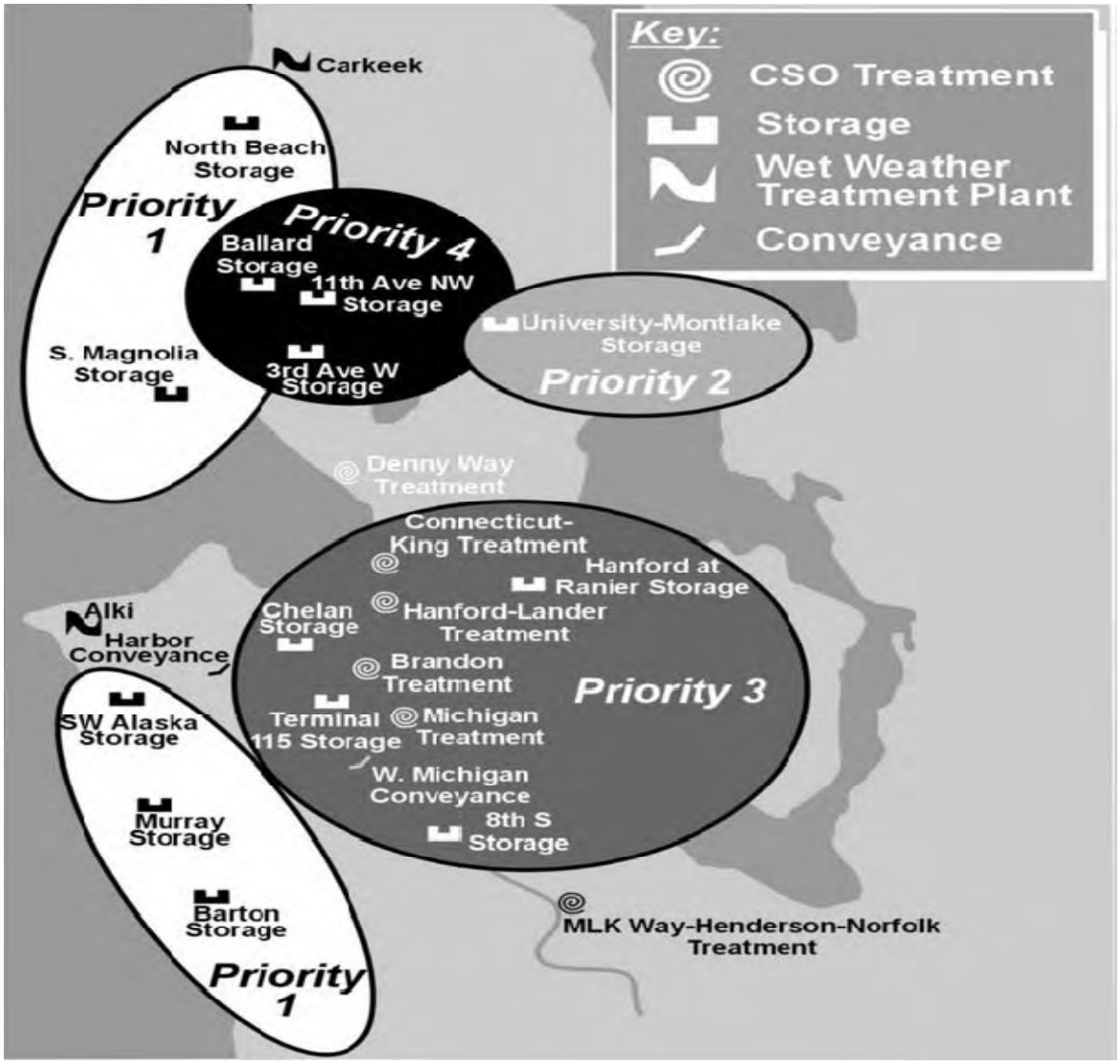

Figure 2.3
KING COUNTY CSO CONTROL PROJECT PRIORITIES

King County
Department of Natural Resources and Parks
Wastewater Treatment Division

Figure 2.3.ai

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2.6.3 1979–1984 Toxicant Pretreatment Planning Study

In 1979, Metro, with the support of the EPA and Ecology, initiated a 5-year, $7-million (in 1979 dollars) study—the *Toxicant Pretreatment Planning Study* (TPPS)—to develop a better understanding of what toxic chemicals were present in the local environment and wastewater, what the impacts of these toxicants were, and the treatability of these flows. A

scientific advisory panel provided advice, oversight, and review during the study. The TPPS recommended that CSO control should be part of a coordinated Elliott Bay Action Plan, and that source control, including enhancing Metro's pretreatment program, should be a priority.

2.6.4 1983 Water Quality Assessment of the Duwamish Estuary

Because of the potential conflict between uses of the Duwamish Waterway, the EPA and Ecology have classified this estuary as a high-priority study area. In a 1982 state/EPA agreement, both agencies identified the Duwamish Waterway as having one of the four worst water quality problems in Washington. As the designated water quality management agency for the Green/Duwamish basin, Metro was awarded a grant to inventory pollutants entering and impacting the waterway, and to develop a strategy for improved pollution control. The 1983 *Water Quality Assessment of the Duwamish Estuary* (also known as the Harper-Owes Study) documented this work. It overlapped TPPS activities in some areas.

This assessment synthesized the findings of the many Duwamish studies performed through July 1982 in order to identify data strengths, deficiencies, and gaps. Public input and interagency task force review comments were considered in developing a ranked list of beneficial uses of the estuary. Mass balances were performed on 20 parameters to identify pollutant impacts to beneficial uses. Upstream sources were found to contribute more than two-thirds of the total sediment, iron, and mercury load, as well as much of the organic carbon and pesticides. Major negative impacts to beneficial uses were attributed to ammonia, residual chlorine, copper, lead, mercury, polychlorinated biphenyls (PCBs), and polycyclic aromatic hydrocarbons (PAHs). Temperature, dissolved oxygen demand, nitrite, cadmium, DDT, pathogens, and sediments were found to produce only minor effects.

The Renton Treatment Plant (now called the South Treatment Plant) was found to contribute nearly 80 percent of the total ammonia load. The anticipated diversion of plant effluent out of the Duwamish River in 1986 was expected to result in marked reductions in ammonia, chlorine, dissolved oxygen demand, nitrite, and cadmium impacts to the Duwamish Estuary. In contrast, although CSOs were found to be a source of all the pollutants measured, their contribution was comparatively small. One exception was fecal coliform bacteria. An estimated 80 percent of the total pathogens released to the estuary were estimated to originate from CSOs. While concentrations of toxicants were found to be relatively high in the CSO flows, the small annual overflow volume made them only a minor source of contaminants.

The most significant finding was that the majority of metal and organic toxicants found in the estuary could not be attributed to documented sources. This shifted attention to the heavy industrial and commercial activity along the river. Future conditions were projected to adversely impact beneficial uses. Temperature, sediment, pathogens, copper, lead,

mercury, PCBs, and PAHs were identified as the greatest contributors to future adverse impacts.

At the conclusion of this work, CSOs were identified as a minor contributor to the larger pollution problem and CSO control was recommended as a part of the solution.

2.6.5 1988 Draft Elliott Bay Action Plan

In 1985, the Puget Sound Estuary Program (PSEP) was formed to minimize toxic chemical contamination of Puget Sound and to protect its living resources. The Urban Bay Action Program, an element of the PSEP, developed the 1988 *Action Plan* (King County, 1988) for the Elliott Bay Action Program. Its objectives were as follows:

- Identify specific toxic areas of concern in the Bay and the Duwamish Waterway based on chemical contamination-associated adverse biological effects;
- Identify historical and on-going sources of contamination;
- Rank toxic problem areas and sources (to the extent possible) in terms of priority for development of corrective actions; and
- Implement corrective actions to reduce or eliminate sources of on-going pollution and restore polluted areas to support natural resources and beneficial uses.

Early accomplishments of the Elliott Bay Action Program included more than 175 inspections at 102 sites, identification of 42 unpermitted discharges, and the development of permits and best management practices for shipyards. Fifteen contaminated upland sites were identified for cleanup, two cleanups were completed, and negotiations of cleanup for 12 additional sites were finalized. By September 1987, enforcement actions included 36 notices of violation, 22 administrative orders, and 28 fines totaling $44,500 (in 1988 dollars).

Through these efforts, most known direct industrial discharges to the Bay and River were terminated or routed to the municipal sewer system under permits. In addition, the effluent discharge point from the Metro Renton Treatment Plant was relocated from the Duwamish River to Puget Sound off Duwamish Head in 1987. The remaining on-going contaminant sources were believed to include contaminated groundwater, storm drains, CSOs, and a few unidentified direct discharges.

To characterize contaminant inputs from CSOs and storm drains (SDs), sediment was collected from the downstream end of seven CSOs, 20 SDs, and 15 combination CSO/SDs. These in-line sediments were compared to off-shore sediments to evaluate CSO and SD contributions to the contamination in priority areas and stations. Ten priority drainages were identified for source-control activities.

Control of direct discharges and stormwater sources were identified as the greatest needs; these controls were expected to improve CSO discharge quality. Metro's Denny Way and Michigan CSOs were identified as priorities for control. Although the Denny Way CSO was not identified as a candidate for source control activities, it was determined that controlling the site would benefit the Denny Way "problem area."

2.6.6 1988–1996 Metro Receiving Water Monitoring Program

In Administrative Order DE-84-577, Ecology instructed Metro to develop and implement a plan for monitoring receiving waters in the vicinity of its primary treatment plants—West Point, Alki, Carkeek, and Richmond Beach—and in other point-source discharge areas. (The Renton plant provided secondary treatment.) The proposed plan included:

- Water column surveys of fecal coliform and enterococcus bacteria;
- Sub-tidal sediment surveys including benthic taxonomy and amphipod bioassays;
- Analysis of conventional constituents (particle size distribution, total organic carbon, oil, and grease), metals, and extractable organic priority pollutants, plus a survey;
- Intertidal monitoring of water for bacteria, and monitoring of sediments for metals and extractable organic priority pollutants; and
- Analysis of clam and algae tissue samples for the presence of bacteria, metals, and extractable organic priority pollutants.

Monitoring was to occur quarterly to biennially at a range of stations near the treatment plants and nearby shorelines.

This “point source” monitoring program was approved by Ecology on April 5, 1988, in a first amendment to Administrative Order DE-84-577. Data were reported to Ecology as quality assurance/quality control (QA/QC) was completed. These data were also summarized in annual marine water quality status reports. The monitoring program was implemented until the 1996 NPDES permit for the West Point plant was issued, which was upgraded to provide secondary treatment after closure of the Richmond Beach plant. Post-1996, Metro focused its monitoring program on collecting data on key parameters that could be used in long-term trend assessments. In parallel, an ambient monitoring program was implemented to provide background data that could be compared to the point-source monitoring data. This comparison helps identify impacts related to Metro discharges, and helps ensure that water quality improvements are not undermined.

These monitoring efforts affirmed that CSO control was a minor-to-moderate part of a larger wet-weather problem. While CSO control was part of the solution, it would not bring the largest benefit.

2.6.7 1988–1997 Metro/King County CSO Discharge and Sediment Characterization Study

In approving Metro’s 1988 CSO control plan, Ecology required CSO and sediment characterization. The purpose of the effort was to obtain additional information to be used in setting site-control priorities and a control project schedule. Because some sampling had already been done, the approved monitoring plan called for taking four discharge samples at five active overflow sites per year until all the sites had been sampled. This sampling was completed in 1994. Sediment sampling was also completed for all sites at the rate of five sites per year. When the state promulgated the Sediment Management Standards and

attendant testing protocols, additional sediment sampling was done to fully meet these requirements. This additional sampling was completed in 1997.

Analysis of overflow samples showed that the variability between different samples at a given site was generally greater than the variability among sites. Sediment sampling confirmed that the local sediments had been significantly impacted by pollution and that the contamination resulted from many sources. Recognizing that further understanding of sediment contamination was needed, the County made it a focus of both the 1999 *CSO Water Quality Assessment for the Duwamish River and Elliott Bay* and the 1999 *Sediment Management Plan*.

The Denny Way CSO, overflow from the Elliott Bay Interceptor which is transported via the Interbay Pump Station, was slightly higher in pollutant concentrations than the other CSOs, affirming it as a priority site for control; chemistry at other overflows did not greatly influence their control priority.

2.6.8 1999 Combined Sewer Overflow Water Quality Assessment for the Duwamish River and Elliott Bay

King County completed the 1999 *CSO Water Quality Assessment for the Duwamish River and Elliott Bay* (WQA) with support from a large stakeholder group and a peer-review panel. The WQA reviewed the health of the Duwamish River and Elliott Bay Estuary and the effects of CSO discharges. A computer model was developed to predict existing and future water and sediment quality conditions, and a risk assessment was undertaken to identify risks to aquatic life, wildlife, and human health. Findings identified during the course of the WQA were taken into account during development of the RWSP CSO control program.

The findings of the WQA affirmed that CSO pollution is a very small part of a larger problem, mainly because of the low pollutant concentrations in CSOs and the brief and infrequent exposure of the estuary to CSOs. It recommended that CSO control continue to meet state regulations and helped determine the priority of the CSO projects in the RWSP. It recommended that locations with greater potential for human contact - the Puget Sound beaches - be controlled first. It identified sediment contamination as the largest risk in the river environment.

2.6.9 1999 Sediment Management Plan

The *Sediment Management Plan* (King County, June 1999) assessed areas near seven county CSOs listed on the Washington State Contaminated Sites list. These areas were assessed for their risk, preferred cleanup approach, partnering opportunities, and potential for recontamination after remediation.

The *Sediment Management Plan* highlighted the growing interest in sediment management as a factor in CSO control planning and the need for more information about CSOs as an on-going or historical contributor to contamination. The Sediment Management Program was formed to implement the *Plan* and any new projects developed after the *Plan* in the broader context of wastewater planning. The program addresses sediment quality issues near CSO discharges and treatment plant outfalls, evaluates and addresses emerging

wastewater treatment sediment quality issues, and incorporates sediment quality considerations into the County's comprehensive long-term planning.

2.6.10 1999 Regional Wastewater Services Plan

In 1999, King County adopted the *Regional Wastewater Services Plan* (King County, November 1999), a comprehensive 30-year wastewater plan. RWSP CSO policies are intended to guide the County in controlling CSO discharges so that all CSO locations meet state and federal regulations. In setting schedules for implementing CSO control projects, the RWSP gives the highest priority to locations with the greatest potential to impact human health, bathing beaches, and ESA-listed species. These policies call for regular assessment of CSO projects, priorities, and opportunities using the most current data available. Another CSO control policy addresses the cleanup of contaminated sediments near county CSOs. The policy directs the County to implement its long-range sediment management strategy and, where applicable, to participate with partners in sharing the responsibilities and costs of cleaning up sites. Sediments near the North Beach CSO outfalls do not require any cleanup at this time. However, pre-construction monitoring will be performed as part of the project to re-evaluate this conclusion.

2.6.11 2000 and 2008 CSO Control Plan Updates

The 2000 *CSO Control Plan* (King County, June 2000) documents King County's compliance with state and federal CSO requirements and updates the CSO Control Plan in the 1999 RWSP. Updates include: redefining the definition of a CSO event, studying alternative methods for CSO control and treatment, researching potential total maximum daily load requirements, developing watershed management programs, studying sediment contamination, developing a sediment management plan, developing a CSO posting and notification program, and listing Chinook salmon under the Endangered Species Act.

The 2008 *CSO Control Plan Update* (King County, June 2008) provides updates required to the County's 2000 *CSO Control Plan*. An Ecology CSO regulation (WAC 173-245) requires that updates coincide with each NPDES permit renewal for the West Point Treatment Plant. Updates are intended to document progress on implementing the county's previous CSO control program, identify the plan for the next five years, and provide a vehicle for making changes in the overall long-term program.

2.6.12 Sediment Quality Summary Report for CSO Discharge Locations

The *Comprehensive Sediment Quality Summary Report for CSO Discharge Locations* (King County, December 2009) documents sediment sampling near the North Beach outfalls.

Sediment samples were collected from six locations proximal to the North Beach Pump Station discharge point in October 1996. Five of the stations formed a transect perpendicular to the end of the outfall and the sixth station was located approximately 1,000 feet from the outfall. Organic carbon concentrations in these six samples ranged from 867 to 1,970 mg/Kg dry weight or approximately 0.09 to 0.20 percent dry weight. Because of these low organic carbon concentrations, organic data from this site were compared to the lowest apparent effects threshold (LAET) and second lowest apparent effects threshold (2LAET) values rather than Sediment Quality Standards (SQS) and cleanup screening level (CSL)

chemical criteria for those compounds generally normalized to organic carbon. The phenol concentration of 461 μg/Kg dry weight detected in the sample collected from one station exceeded the dry weight normalized SQS of 420 μg/Kg dry weight. This station is located approximately 230 feet from the end of the outfall. All other detected chemical concentrations were less than their respective SQS criteria or LAET values. No sediment remediation activity is planned at this time.

2.7 PROJECT PLANNING PERIOD

The North Beach Basin CSO Control Project is one of four CSO control projects undertaken as part of the King County long-term control plan. CSO control volumes described in this Facility Plan to meet the CSO control requirements have been determined based on historical flow monitoring from December 2007 through June 2008, pump tests performed in December 2008 and November 2009, and modeling using long-term rainfall records. The proposed facilities have been evaluated based on an anticipated construction start date of 2013 and a project life of 35 years.