RESTORE OUR WATERS
SEATTLE PUBLIC UTILITIES
COMBINED SEWER OVERFLOW REDUCTION

Henderson Basin 44 CSO Reduction Project

Final Environmental Impact Statement

January 2013

HDR CH2MHILL

City of Seattle
Seattle Public Utilities

January 3, 2013

Dear Affected Agencies, Tribes, Organizations, and Interested Parties,

Enclosed is the Final Environmental Impact Statement (Final EIS) for the proposed Henderson Basin 44 Combined Sewer Overflow (CSO) Reduction Project.

The proposed project consists of an underground storage tank to store excess sewage and stormwater flows from Basin 44 in southeast Seattle during heavy rains, and associated infrastructure, shoreline, and landscape improvements. Once constructed, the project would reduce the number and volume of raw sewage and untreated stormwater overflows to Lake Washington, which would help protect public health and would improve water quality in the lake. The proposed project also is needed to bring the basin into compliance with state and federal regulations that limit the number of raw sewage overflows to a long-term average of no more than one per year.

The FEIS evaluated three alternatives:

- **Tennis Courts Alternative** - Storage under Seward Park Tennis Courts (the preferred alternative)
- **Parking Lot Alternative** - Storage under Seward Park Parking Lot
- **No Action Alternative** – No reduction in sewage overflows

Both the Tennis Courts and Parking Lot Alternatives include four main components:

- An underground, 2.4-million-gallon storage tank and associated infrastructure
- Shoreline treatment
- Replacement of the existing CSO overflow pipe into Lake Washington
- Transfer of Urban Park and Recreation Recovery (UPARR) grant restrictions and upland landscaping enhancements along Lake Washington Boulevard

The Final EIS analyzes the environmental impacts of the proposed alternatives. Environmental issues include short-term construction impacts (e.g., noise, dust, vibration, odors, parking, truck traffic) and long-term impacts on park users and adjacent neighbors, and loss of trees. The key issue is whether the storage facility should be located under the tennis courts or under the parking lot.

Ray Hoffman, Director
Seattle Public Utilities
700 5th Avenue, Suite 4900
PO Box 34018
Seattle, WA 98124-4018

Tel (206) 684-5851
Fax (206) 684-4631
TDD (206) 233-7241
ray.hoffman@seattle.gov

http://www.seattle.gov/util

The Final EIS responds to comments received during the Draft EIS comment period and includes some modification and revisions to the analysis provided in the Draft EIS as appropriate. The Final EIS is a standalone document addressing all of the State Environmental Policy Act (SEPA) required environmental elements (rather than a summary of the changes from the Draft EIS).

The appeal period associated with this Final EIS is January 3, 2013 through January 17, 2013.

Thank you for your interest in the Henderson Basin 44 CSO Reduction Project.

Sincerely,

Betty Meyer
SEPA Responsible Official

Fact Sheet

Name of Proposal

Henderson Basin 44 Combined Sewer Overflow (CSO) Reduction Project

Proponent

City of Seattle; Seattle Public Utilities (SPU)

Location

The proposed project would be located in Basin 44 in southeast Seattle. Basin 44 is the geographic area that contributes CSOs to Lake Washington via CSO Outfall 44 near Seward Park. The eastern boundary of Basin 44 is Lake Washington. Other Basin 44 boundaries are generally 52nd Avenue South to the west, South Hudson Street to the north, and South Morgan Street to the south. The 375-acre basin includes residential neighborhoods and Seward Park.

Most of the proposed project components would be located in Seward Park with some minor components at a site approximately one mile north of Seward Park near the intersection of Lake Washington Boulevard South and 53rd Avenue South.

Purpose

The proposed project consists of an underground storage tank to store excess sewage and stormwater flows from Basin 44 during heavy rains, and associated infrastructure, shoreline, and landscape improvements. Once constructed, the project would reduce the number and volume of raw sewage and untreated stormwater overflows to Lake Washington, which would help protect public health and would improve water quality in the lake. The proposed project also is needed to bring the basin into compliance with state and federal regulations that limit the number of raw sewage overflows to a long-term average of no more than one per year.

Proposed Alternatives

SPU identified the following alternatives for evaluation in the Final EIS:

- Tennis Courts Alternative - Storage under Seward Park Tennis Courts (the preferred alternative)
- Parking Lot Alternative - Storage under Seward Park Parking Lot
- No Action Alternative - No reduction in sewage overflows

Tennis Courts and Parking Lot Alternatives: Both alternatives consist of the four main components listed below. Project components for the two alternatives would be similar; the main difference would be the location of the CSO storage tank and shoreline treatment. The project components for the Tennis Courts and Parking Lot Alternatives include the following:

- An underground, 2.4-million-gallon storage tank and associated infrastructure
- Shoreline treatment
- Replacement of the existing CSO overflow pipe into Lake Washington
- Transfer of Urban Park and Recreation Recovery (UPARR) grant protections and upland landscaping enhancements

The first three elements would be located in Seward Park. The fourth element would be located in a portion of Lake Washington Boulevard Park approximately one mile north of Seward Park near the intersection of Lake Washington Boulevard South and 53rd Avenue South.

No Action Alternative: Under the No Action Alternative, the CSO storage tank and associated infrastructure would not be built. The shoreline treatment next to the CSO storage tank and the transfer of UPARR grant protections would also not be implemented. The existing CSO outfall pipe would eventually be replaced because it is in poor condition and was previously recommended for replacement. The outfall replacement is expected to occur between 2015 and 2020, under the SPU Outfall Rehabilitation Program.

Implementation Date

If the project is approved, construction is anticipated to occur from mid-2015 to the end of 2017.

Final Action

The proposed project may not proceed unless the City Council approves the project pursuant to Ordinance 118477 (a.k.a., “Initiative 42”), and before permits and approvals are obtained from government agencies. The Council is expected to hold a public hearing regarding the proposed project, and decide whether to approve it, in 2013. Decisions approving or denying permits and approvals are expected to occur in 2013-2014.

Date of Final Action

Construction is anticipated to occur from mid-2015 to the end of 2017.

Required Approvals or Permits

The table below lists the anticipated permits and approvals.

Agency/Jurisdiction	Permit/Approval
Federal	
National Park Service	• Section 1010 UPARR Impact Mitigation Approval • National Environmental Policy Act (NEPA) Compliance
U.S. Army Corps of Engineers	• Rivers and Harbors Act Section 10/Clean Water Act Section 404 Permit
U.S. Fish and Wildlife Service/National Marine Fisheries Service	• Section 7 Endangered Species Act Compliance
State	
Washington State Recreation & Conservation Office	• Land Use Approval
Washington Department of Ecology	• Facility Plan Approval • NPDES Construction Stormwater General Permit • 401 Water Quality Certification[1] • Coastal Zone Consistency Determination[1]
Washington Department of Fish and Wildlife	• Hydraulic Project Approval
Washington Department of Archaeology and Historic Preservation	• Section 106 National Historic Preservation Act Consultation
Local	
Seattle City Council	• Initiative 42 Approval (Park Lands Conversion) • Partial Transfer of Jurisdiction
Seattle Department of Planning and Development	• Type V Council Land Use Decision – Concept Approval for City Facility • Master Use Permit II – SEPA Conditioning Approval • Master Use Permit II – Shoreline Substantial Development Permit • Environmental Critical Areas Approval • Clear and Grade Permit • Building Permit – Storage Tank, Facilities Vault, and Shoring • Electrical Permit • Plumbing Permit • Mechanical Permit
Seattle Design Commission	• Project Review
Seattle Department of Transportation	• Street Use Permit
Seattle Parks and Recreation	• Revocable Use Permit
Seattle Public Utilities	• State Environmental Policy Act (SEPA) Compliance
Public Health – Seattle & King County	• Health Permit (Air Gap)
King County	• Industrial Waste Discharge Permit/Construction Dewatering Approval

[1]These may be included as part of a Corps of Engineers Permit.

Authors and Principal Contributors to this EIS

This EIS has been prepared under the direction of Seattle Public Utilities. The following consulting firms provided research and analysis associated with this EIS:

- **HDR Engineering** – lead EIS consultant; document preparation; writing of the following chapters: recreation; aesthetics, light, and glare; habitat, wildlife, and plants; transportation; water resources; air quality, odor, and climate change; geology; land and shoreline uses; noise and environmental hazards; energy and natural resources; public services and utilities; environmental justice; cumulative impacts
- **CH2M Hill** – engineering support; writing cultural resources chapter
- **HBB Landscape Architecture** – conceptual landscaping design; recreation research
- **Urban Forestry Services, Inc.** – tree inventory of Seward Park
- **Historical Research Associates, Inc.** – cultural resources research
- **Shannon & Wilson** – geotechnical research

Project Proponent and Lead Agency

City of Seattle, Seattle Public Utilities
Seattle Municipal Tower, Suite 4900
P.O. Box 34018
Seattle, WA 98124-4018

SPU SEPA Responsible Official

Betty Meyer
Seattle Public Utilities
Seattle Municipal Tower, Suite 4900
P.O. Box 34018
Seattle, WA 98124-4018
betty.meyer@seattle.gov

Project Information / Background Data Contact Person

Kathy Robertson, PE, SPU Project Manager
kathy.robertson@seattle.gov
Ph: (206) 733-9396

Date of Issuance of this Final EIS

January 3, 2013

Availability of the Final EIS and Background Materials

The Final EIS is available for viewing at the following locations:

- Seattle Public Utilities, Director's Office Main Reception Area, Seattle Municipal Tower, Suite 4900, 700 Fifth Avenue, Seattle, Washington
- Seattle Central Library, Public Review Documents, Level 5 Reference
- Online at www.seattle.gov/cso/northhenderson

The Final EIS can be downloaded for free from the www.seattle.gov/cso/northhenderson website or purchased on CD for $10 or in paper form for $170. Purchased copies will be mailed upon receipt of a check made payable to Seattle Public Utilities.

Additional background materials can be viewed on the www.seattle.gov/cso/northhenderson website. They may also be viewed in paper form by arranging a time with Kathy Robertson, PE, SPU Project Manager, at kathy.robertson@seattle.gov or (206) 733-9396.

The Final EIS and the background materials will be available until the close of the Final EIS appeal period, which is January 3 to January 17, 2013.

Appeal of the Final EIS

Appeals of the Final EIS must be accompanied by a $85.00 filing fee and must be filed by 5:00 p.m. on January 17, 2013.

- Written appeals must be sent to:
  City of Seattle Hearing Examiner
  700 5th Avenue Suite 4000
  P.O. Box 94729
  Seattle, WA 98124-4729
- Appeals can be filed electronically. Details on electronic filing procedures are available under "e-File" at the Office of the Hearing Examiner's web site: http://www.seattle.gov/examiner/
- Filing fees must be paid by the appeal deadline and can be paid via check (made payable to the City of Seattle) or credit/debit card (Visa and MasterCard only). Credit/debit card payments can be made in-person or over-the-phone.

You should be prepared to make specific factual objections. Please refer to the Hearing Examiner Rules of Practice and Procedure for rules that govern appeals, which are available on the Hearing Examiner's website at www.seattle.gov/examiner/rules-toc.htm or by calling 206-684-0521.

This page was left intentionally blank.

Table of Contents

List of Tables

List of Figures

Appendices

List of Acronyms

ADA	Americans with Disabilities Act
APE	Area of Potential Effects
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CIG	Climate Impacts Group
Corps	U.S. Army of Corps of Engineers
CSO	Combined Sewer Overflow
CWA	Clean Water Act
DAHP	Department of Archaeology and Historic Preservation
dBA	decibels
dbh	diameter at breast height
DPD	Department of Planning and Development
DS	Determination of Significance
EIS	Environment Impact Statement
EPA	Environmental Protection Agency
ESA	Endangered Species Act
FHWA	Federal Highway Administration
FOSP	Friends of Seward Park
FWHCA	Fish and Wildlife Habitat Conservation Areas
HPI	Historic Property Inventory
HRA, Inc.	Historical Research Associates
HVAC	heating, ventilation, and air conditioning
kWh	kilowatt hours
MG	million gallons
MOA	Memorandum of Agreement
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
ND	no data
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NPS	National Park Service
NRHP	National Register of Historic Places

PCBs	polychlorinated biphenyls
PCE	primary constituent element
PDO	Pacific Decadal Oscillation
PM2.5	particulate matter 2.5 micrometers or less
PM10	particulate matter 10 micrometers or less
PPM	part per million
PSCAA	Puget Sound Clean Air Agency
REC	recognized environmental conditions
RCW	Revised Code of Washington
SDOT	Seattle Department of Transportation
SEPA	State Environmental Policy Act
SHPO	State Historic Preservation Officer
SMC	Seattle Municipal Code
SPU	Seattle Public Utilities
UPARR	Urban Park and Recreation Recovery
US BTS	U.S. Bureau of Transportation Statistics
US EIA	U.S. Energy Information Administration
USFWS	U.S. Fish and Wildlife Service
WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WHR	Washington Heritage Register
WISAARD	Washington Information System for Architectural and Archaeological Records Data (DAHP online database)
WPA	Works Progress Administration
WSDOT	Washington State Department of Transportation

1 Summary

1.1 What is the Henderson Basin 44 CSO Reduction Project and why is it needed?

Sewers in the project area carry raw sewage away from the neighborhood for treatment at King County's West Point and South treatment plants before discharge to Puget Sound. When it rains, these same sewers also carry untreated stormwater from neighborhood roofs, foundation drains, and some streets. During heavy rains, if the amount of raw sewage and untreated stormwater exceeds the sewer system capacity, the excess flows discharge into Lake Washington. The term for these overflows is "Combined Sewer Overflows," or CSOs, and they are a public health and environmental concern. The goal of the Henderson Basin 44 CSO Reduction Project is to reduce the number and volume of these sewage overflows from the project area. Basin 44 is in southeast Seattle along the western shoreline of Lake Washington.

Seward Park is owned and managed by the Seattle Department of Parks and Recreation (Seattle Parks) and is the site of the Henderson Basin 44 CSO Reduction Project. The proposed project consists of building a 2.4-million-gallon (MG) underground storage tank to store excess sewage and stormwater flows in Basin 44 during heavy rain events. The project also includes additional infrastructure, shoreline, and landscape improvements.

The proposed project would help protect public health, improve water quality in Lake Washington, and comply with regulations by reducing the number of CSO events in Basin 44 to a long-term average of no more than one untreated discharge per year per outfall.

1.2 What Alternatives does this EIS consider?

SPU identified the following alternatives for evaluation in this EIS:

- Tennis Courts Alternative - Storage under Seward Park Tennis Courts (the preferred alternative)
- Parking Lot Alternative - Storage under Seward Park Parking Lot
- No Action Alternative

1.2.1 Tennis Courts and Parking Lot Alternatives

Both the Tennis Courts and the Parking Lot Alternatives consist of the following four main elements (see Figure 1-1). The two alternatives are similar; the main difference is the location of the CSO storage tank and shoreline treatment.

- An underground, 2.4 MG CSO storage tank and associated infrastructure
- Shoreline treatment
- Replacement of an existing CSO outfall pipe
- A transfer of Urban Park and Recreation Recovery (UPARR) grant protections and upland landscaping enhancements

The first three elements are located in Seward Park. The fourth element is located in a portion of Lake Washington Boulevard Park approximately one mile north of Seward Park near the intersection of Lake Washington Boulevard South and 53rd Avenue South.

- **CSO Storage Tank and Associated Infrastructure:** A new underground 2.4 MG CSO storage tank in the southwest corner of Seward Park, next to Lake Washington. The CSO storage tank would be located under the tennis courts and an adjacent parking lot (Parking Lot 1) for the Tennis Courts Alternative and under a different parking lot (Parking Lot 2) for the Parking Lot Alternative. These two locations are approximately 300 feet apart. An underground facilities vault attached to the CSO storage tank would contain odor control, mechanical, electrical, and control systems. A small, nearby area would contain several aboveground features (e.g., electrical cabinet, air intakes and exhaust vents, and odor control exhaust vent). Additional aspects include adding combined sewer pipes and a water pipe, and making minor modifications to the existing combined sewer system.
- **Shoreline Treatment:** For both the Tennis Courts and the Parking Lot Alternatives, the proposed locations for the CSO storage tank are adjacent to the shoreline where there are existing bulkheads (or retaining walls) waterward to control beach erosion from wave action. SPU has options on how the shoreline could be restored after construction of the CSO storage tank. The shoreline could be retained in its current state with the existing bulkhead and the area between the CSO storage tank and the lake could be planted with lawn and upland native landscaping. Alternatively, SPU could remove the existing bulkhead and construct a new, rounded-gravel beach, with native beach and upland landscaping shoreward and large woody debris or other features anchored in the water that provide cover for fish. Between the beach and the new CSO storage tank, SPU would install a new wall made of stone, concrete, or similar material to protect the CSO storage tank and the tennis courts or parking lot (depending on the Alternative selected) from wave action during storms. The final configuration of the shoreline would be decided during the project's design phase.
- **Replacement of the Existing CSO Outfall:** The outfall pipe that conveys CSOs from Basin 44 into Lake Washington. A previous evaluation of SPU's CSO outfalls determined that the existing 24-inch-diameter wood pipe is in poor condition and recommended the outfall for replacement (SPU 2006). SPU decided to replace the CSO outfall pipe as part of the proposed project because a single construction project would be less disruptive to Seward Park.

D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EIS\map_AP_DEIS_Fig01-01_v5_exec_sum.mxd 12/4/2012

Legend

- UPARR Grant Protections Removed
- Potential Project Areas
- Shoreline Treatment
- Basin 44
- Road

0 300 600 1,200 Feet

N

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

TENNIS COURTS AND PARKING LOT ALTERNATIVES

JANUARY 2013 | **FIGURE 1-1**

This page was left intentionally blank.

- **Transfer of UPARR Grant Restrictions and Upland Landscaping Enhancements:** The National Park Service's (NPS) Urban Park and Recreation Recovery (UPARR) program funded several previous improvements within Seward Park by a federal grant. A condition of receiving the funds was that the property remains in recreational use in perpetuity. Several aspects of this project conflict with that condition. The UPARR program allows for a transfer of the grant protections to another area not already associated with the grant. Therefore, the grant protections would be removed from a small area in Seward Park and transferred to a portion of Lake Washington Boulevard Park north of Seward Park near the intersection of Lake Washington Boulevard South and 53rd Avenue South (the UPARR replacement area). Several aboveground features would be constructed in the area in Seward Park that would have the grant protections removed. Additionally, upland landscaping enhancements in the UPARR replacement area would be implemented, consisting of removing invasive species and planting native shrubs and trees along the waterfront. The upland landscaping enhancements would occur both within and adjacent to the area where the grant protections would be added.

1.2.2 No Action Alternative

Under the No Action Alternative, the CSO storage tank and associated infrastructure would not be built. The shoreline treatment and the transfer of UPARR grant protections also would not be implemented. The existing CSO outfall would eventually be replaced because it is in poor condition and was previously recommended for replacement. The outfall replacement is expected to occur between 2015 and 2020, under the SPU Outfall Rehabilitation Program.

Under the No Action Alternative, there would be no reduction in the number or volume of raw sewage discharges and the number of CSO events would continue to exceed the regulatory requirement of a long-term average of no more than one untreated discharge per year, in violation of federal and state law. Penalties for not meeting the regulatory requirement include fines and imprisonment.

1.3 How was the preferred alternative identified and how was the public involved in the process?

SPU identified and analyzed a number of alternatives to control CSOs in the vicinity of Seward Park (Basin 44). The process of identifying and analyzing alternatives was completed in conjunction with a public participation process that began in Summer 2010. The process was as follows:

- Step 1 – Identify and Evaluate High-level CSO Control Options
- Step 2 – Identify and Evaluate Storage Themes and Sewer Separation /Natural Drainage Systems
- Step 3 – Identify and Evaluate General Storage Locations
- Step 4 – Identify and Evaluate Site-Specific Storage Alternatives

Step 1 – Identify and Evaluate High-Level CSO Control Options

In 2010, SPU began with identifying four high-level CSO control options for Basin 44. A "CSO control option" is a technology that can be implemented to reduce CSOs. The four high-level CSO control options were: treatment, storage, sewer separation and Natural Drainage Systems, and flow transfers. These control options were evaluated for costs, technical feasibility, and community impacts. The evaluation identified storage and sewer separation/Natural Drainage Systems as the only viable CSO control options. SPU held a public workshop on November 18, 2010, to present the options and their evaluation.

Step 2 – Identify and Evaluate Storage Themes and Sewer Separation/Natural Drainage Systems

SPU identified and evaluated sewer separation/Natural Drainage Systems and three different storage themes: tunnel storage, pump and storage in Martha Washington Park, and storage in the vicinity of Seward Park. The storage themes and the sewer separation/Natural Drainage Systems option were evaluated for their costs and impacts. SPU held three public workshops on December 14, 2010, January 19, 2011, and March 10, 2011, to discuss the evaluation. The evaluation identified storage in the vicinity of Seward Park as the viable storage theme for Basin 44.

Step 3 – Identify and Evaluate General Storage Locations

SPU identified three general storage locations in the vicinity of Seward Park:

- Storage underneath private property
- Storage underneath Lake Washington Boulevard South
- Storage in Seward Park

For each of the general storage locations, representative locations were identified to provide an example of where the storage facility would be located and its costs and impacts. Through the public process and SPU's evaluation of the costs and benefits, SPU selected storage in Seward Park as its general storage location. The public workshops held on December 14, 2010, January 19, 2011, and March 10, 2011, included the evaluation of the general storage location.

Step 4 – Identify and Evaluate Site-Specific Storage Alternatives

In Summer 2011, SPU identified and developed two site-specific alternatives for storage in Seward Park. Those two alternatives were the Tennis Courts Alternative and the Parking Lot Alternative. The two site-specific alternatives were presented at a scoping meeting for the Draft EIS on June 7, 2011. (See following paragraph for details on the scoping process.) Following the scoping meeting, SPU analyzed the environmental impacts of the alternatives and issued a Draft EIS for public review.

Prior to the EIS scoping meeting and in accordance with the State Environmental Policy Act (SEPA), SPU issued a Determination of Significance and Request for Comments on Scope of EIS (DS) on May 26, 2011 (see Appendix A). The DS described the purpose of the proposed project, the three alternatives that would be considered in an EIS (Parking Lot Alternative, Tennis Courts Alternative, and No Action Alternative), and the environmental elements that would be discussed in the EIS. The DS invited agencies, affected tribes, and members of the public to comment on the scope of the EIS; provided the date, time, and location of the public scoping meeting; provided the name, address, email address, and phone number of the SEPA Responsible Official; and directed people to respond with their comments via email or in writing by June 16, 2011 to the SEPA Responsible Official. Additional SEPA required public notification included the following:

1. The DS was posted on the Seattle Department of Planning and Development's Land Use Bulletin on May 26, 2011.
2. The DS was posted on the Washington State Department of Ecology's SEPA Register on May 26, 2011.
3. The DS was published in the Daily Journal of Commerce on May 26, 2011.
4. The DS was published in the South Seattle Beacon on June 1, 2011.
5. The DS was mailed to agencies with jurisdiction and to organizations and individuals who had provided written request for such notices (see DS Distribution List in Appendix A).
6. The DS was available for public review at SPU's main office on the 49th floor of the Seattle Municipal Tower.

Additional voluntary public outreach included the following:

1. The DS was posted on SPU's North Henderson project website.
2. The DS was mailed to additional organizations SPU assumed might have an interest in the project (see DS Distribution List in Appendix A).
3. Postcards were mailed to every residence in Basins 44 and 45 (see map in Appendix A, approximately 1,700 total), notifying residents of the EIS scoping process; the date, time, and location of the scoping meeting; and the address and deadline for submitting scoping comments.
4. One of the postcards also was posted on the project sign at Seward Park.
5. An email announcing the public scoping meeting was sent to people who had previously requested to be included on the North Henderson listserv to receive updates on the North Henderson CSO reduction projects.
6. A notice was posted on the City's online public outreach and engagement calendar.
7. Advanced meeting notice was provided in the Rainier Valley Post.
8. Meeting flyers were delivered to community centers, public libraries, synagogues, and post offices.

9. A community guide to the proposed project was developed for the scoping meeting to help explain the proposed project and the three alternatives to the public.
10. A comment form was developed for the scoping meeting, to help encourage meeting attendees to provide input and feedback.
11. Following the scoping meeting, the community guide and the comment form were posted on SPU's North Henderson project website.
12. Following the scoping meeting, a scoping summary report was prepared and posted on the SPU's North Henderson project website.

Fourteen people attended the scoping meeting, and eight people submitted comments. The scope of the EIS was adjusted to reflect scoping input, and the environmental impacts of each alternative were analyzed.

The environmental analysis indicated that both the Parking Lot Alternative and the Tennis Courts Alternative would have environmental impacts, some of which were the same for these two alternatives and some of which were not. Once the environmental analysis was complete, SPU identified the preferred alternative based on a review of the types of impacts and their significance. The Tennis Courts Alternative was identified as the preferred alternative because: (a) Seward Park is a destination park; visitors from all over the Seattle area come to the Park to enjoy its many amenities; (b) the Tennis Courts Alternative would have less short-term (construction) impacts on recreation than the Parking Lot Alternative; and (c) other environmental impacts were not significant as defined by SEPA (i.e., there was not a reasonable likelihood of more than a moderate adverse impact on environmental quality). SPU then prepared a Draft EIS summarizing the findings of the environmental analysis and indicating the preferred alternative.

SPU issued a Notice of Availability of the Draft EIS on September 17, 2012 (see Appendix A). The Notice of Availability described the purpose of the proposed project and the three alternatives that were considered in the Draft EIS (Parking Lot Alternative, Tennis Courts Alternative, and No Action Alternative). The Notice of Availability invited agencies, affected tribes, and members of the public to comment on the Draft EIS; provided the date, time, and location of the Draft EIS public hearing; provided the name, address, email address, and phone number of the project manager and the SEPA Responsible Official; and directed people to respond with their comments via email or in writing by October 17, 2012 to the SEPA Responsible Official. Additional SEPA required public notification included the following:

1. The Notice of Availability was posted on the Seattle Department of Planning and Development's Land Use Bulletin on September 17, 2012.
2. The Notice of Availability was posted on the Washington State Department of Ecology's SEPA Register on September 17, 2012.
3. The Notice of Availability was published in the Daily Journal of Commerce on September 17, 2012.
4. The Notice of Availability was published in the Seattle Times on September 17, 2012.

5. The Notice and the DEIS were mailed to agencies with jurisdiction, organizations and individuals who requested copies, and organizations and individuals who commented during the scoping process (see Draft EIS Distribution Lists in Appendix A).
6. The Draft EIS was available for public review at SPU's main office on the 49th floor of the Seattle Municipal Tower and the Seattle Central Library.

Additional voluntary public outreach included the following:

1. The Notice of Availability and Draft EIS were posted on SPU's North Henderson project website.
2. The Notice of Availability, or the Notice of Availability and Draft EIS, were mailed to additional individuals and organizations SPU assumed might have an interest in the project (see Notice of Availability and Draft EIS Distribution Lists in Appendix A).
3. Postcards were mailed to every residence in Basins 44 and 45 (see map in Appendix A, approximately 1,700 total), notifying residents of the date, time, and location of the Draft EIS public hearing; providing the address and deadline for submitting comments on the Draft EIS; and providing the address of SPU's North Henderson project website for more information.
4. An email announcing the public hearing was sent to people who had previously requested to be included on the North Henderson listserv to receive updates on the North Henderson CSO reduction projects.
5. SPU staff contacted the individuals whose property adjoins the tennis courts to ensure they knew about the Draft EIS and the public hearing.

Twenty-eight people attended the public hearing and nine individuals testified. Comments also were received by email and by US Postal Service from nineteen individuals, organizations, and agencies. The comments and responses are included in Appendix B.

In 2013, there will be an additional opportunity for the public to provide input on the Tennis Courts Alternative and the Parking Lot Alternative at a City Council public hearing to address the requirements of Seattle City Ordinance 118477 (aka, "Initiative 42"). Per Initiative 42, the Seattle City Council must hold a public hearing prior to making a determination whether there is "no reasonable and practical alternative" to constructing the facility in Seward Park. Similarly, the City Council will decide which of the two locations within Seward Park (tennis courts vs. parking lot) is preferred. Finally, the City Council will make a determination whether or not the proposed underground storage tank is "compatible with park use." SPU expects the City Council to hold the public hearing and make these determinations in 2013.

1.4 Are there significant areas of controversy or uncertainty?

A significant area of controversy is the location of the preferred alternative. Nearby neighbors of Seward Park believe that identifying the Tennis Courts Alternative as the preferred alternative prioritizes Seward Park users over the neighbors who live immediately west of the tennis courts. As many of the comments on the Draft EIS have noted (see Appendix B), although the Tennis Courts Alternative may have lesser impacts on park users, visitors to the park are present intermittently and for shorter durations, and they also have an option regarding which park they visit. In contrast, the Tennis Courts Alternative will have greater impacts on the park's neighbors, who do not have other options on where to live. Neighbors have identified that the Tennis Courts Alternative will have greater impacts on their residences with respect to construction noise, dust, odors, and vibration, and operational noise and odors. The neighbors have also expressed concerns regarding the removal of trees separating the residences from the park, and the potential for increased crime activity as a result. In contrast, Seward Park users have expressed their support for the Tennis Courts Alternative because of the lesser impacts to the Audubon Center, the clay studio, the playground, the picnic shelter, and parking.

The impacts identified in the EIS, as well as all the comments from the project stakeholders, will be presented to the City Council in 2013 during the final site selection for the project, as described in Section 1.3.

1.5 What are the potential impacts of the proposed project?

Table 1-1 summarizes the identified potential impacts, as well as measures that SPU would take to help reduce or eliminate potential impacts.

1.6 Would there be significant adverse impacts that could not be reduced or eliminated?

Construction of the proposed project would potentially have the following short-term unavoidable impacts on recreation:

- **Temporary Closure of Tennis Courts:** For the Tennis Courts Alternative, the tennis courts would be closed for up to approximately 30 months for construction of the CSO storage tank under that location. For the Parking Lot Alternative, the tennis courts would be closed for 18 to 30 months if selected as a location for construction staging. The closure of the tennis courts would require people to travel to other tennis courts in the area and increase the competition for court time.
- **Temporary Closure of Parking Lot 1:** For the Tennis Courts Alternative, Parking Lot 1 would be closed for up to approximately 30 months for construction of the CSO storage tank under that location. For the Parking Lot Alternative, Parking Lot 1 would be closed for 18 to 30 months if selected as a location for construction staging. The closure of Parking Lot 1 would reduce available parking, increase traffic congestion, reduce staging areas for special events, and make recreational facilities less accessible within Seward

Park, particularly on weekends and in the summer. Some park users may choose to use on-street parking outside of the park, reducing the availability of on-street parking for other uses, or use other parks, increasing the level of activity at those locations.

- **Temporary Closure of Parking Lot 2:** For the Parking Lot Alternative, Parking Lot 2 would be closed for up to approximately 30 months for construction of the CSO storage tank under that location. For the Tennis Courts Alternative, Parking Lot 2 would be closed for 18 to 30 months if selected as a location for construction staging. The closure of Parking Lot 2 would reduce available parking, increase traffic congestion, reduce staging areas for special events, and make recreational facilities less accessible within Seward Park, particularly on weekends and in the summer. Some park users may choose to use on-street parking outside of the park, reducing the availability of on-street parking for other uses, or use other parks, increasing the level of activity at those locations.

Other potential impacts (e.g., construction noise, dust, vibration, odors, and truck traffic and operational noise and odors) are expected to be less than significant because of measures designed to reduce or eliminate adverse impacts.

This page was left intentionally blank.

Table 1-1. Summary of Potential Impacts and Measures to Reduce or Eliminate Impacts

Resources	Tennis Courts Alternative		Parking Lot Alternative		No Action Alternative [1]		Measures to Reduce or Eliminate Potential Impacts
	During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)	
Recreation	• Loss of UPARR protection for aboveground features area. • Close and demolish tennis courts for 30 months. • Close Parking Lot 1 for 30 months. • Close Parking Lot 2 fully or partially for 18 to 30 months. • Remove row of poplar trees next to tennis courts. • Increase use of on-street parking in adjacent neighborhood. • Suspend recreation in the construction area including shoreline access. • Disturb nearby park users at playground and Picnic Shelters 1 and 2 (but less so than the Parking Lot Alternative). • Increase traffic and noise in park. • Reduce parking for users of Audubon Center, Clay Studio, Picnic Shelters, and amphitheater.	• Restrict certain future uses in location of CSO facilities (including in above ground features area). • Loss of two public parking spaces in Parking Lots 1 and 2. • Temporarily close tennis courts and part of Parking Lot 1 for maintenance activities.	• Loss of UPARR protection for aboveground features area. • Close tennis courts for 18 to 30 months. • Close Parking Lot 1 fully or partially for 18 to 30 months. • Close Parking Lot 2 for 30 months. • Remove row of poplar trees next to Parking Lot 2. • Increase use of on-street parking in adjacent neighborhood. • Suspend recreation in the construction area including shoreline access. • Disturb nearby park users at playground and picnic shelters 1 and 2 (more so than the Tennis Courts Alternative). • Increase traffic and noise in park. • Reduce parking for users of Audubon Center, Clay Studio, Picnic Shelters, and amphitheater.	• Restrict certain future uses in location of CSO facilities (including in aboveground features area). • Loss of five public parking spaces in Parking Lots 1 and 2. • Temporarily close part of Parking Lot 2 for maintenance activities.	• None	• None	**Park Use and Access** • Consider a range of construction staging methods and sites, including offsite locations, to minimize impacts on park users. • Return recreational uses disrupted during construction to pre-construction conditions or better. • Schedule construction to avoid or minimize overlap with the construction of other projects in the vicinity to the extent feasible. • Provide advance public notice, signage, and website information regarding restrictions to shoreline areas, parking lots, tennis courts, and options for other nearby recreation areas and parking areas. • Perform routine maintenance activities during periods of low park use. • Restore the shoreline using native Northwest plants, guidance from the Seward Park Vegetation Management Plan, and review and approval from Seattle Parks. • Restore the landscaping around the aboveground features with native plants and a planting plan that incorporates Olmsted design principles. • Improve ADA access to picnic shelters such as 3, 4, and 5. **Parking** • Provide advance public notice, signage, and website information regarding alternative parking locations. • Continue communications and outreach efforts, including briefings to community and stakeholder groups and SPU tables at events in Seward Park and other community events. • Place signage at the entrance of Seward Park showing locations of alternative parking locations within the park and alternative playground areas. • Provide drop off zone and short-term parking to unload passengers, strollers, kayaks, etc., near the entrance to Seward Park. • Provide temporary ADA parking spaces to replace those unavailable during construction. • Restore as many parking spaces as possible. • Restore use of parking lot as soon as feasible. **Special Events** • Coordinate construction hours with the scheduling of special events at Seward Park. • Suspend construction in the park during Seafair. • Work with Seattle Department of Parks and Recreation and event coordinators to find new staging locations (e.g., the Seward Park meadow or Genesee Park) for use during special events. • Avoid scheduling routine maintenance during special events. • Provide advance public notice, signage, and website information regarding construction dates. **Safety** • Install fencing around the construction site and clearly mark construction areas. • Use flaggers when trucks and heavy equipment enter or exit the park. • Monitor construction to confirm that the contractor complies with public safety plans. • Provide advance public notice, signage, and website information regarding construction dates.

Resources	Tennis Courts Alternative		Parking Lot Alternative		No Action Alternative [1]		Measures to Reduce or Eliminate Potential Impacts
	During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)	
Cultural Resources	• Loss of UPARR protection for aboveground features area is an adverse effect under Section 106 of the National Historic Preservation Act. • Adversely affect a contributing resource to the Seward Park Historic District and Designed Landscape by removing tennis courts during construction.	• Improve historic character by removal of trees near the tennis courts.	• Loss of UPARR protection for aboveground features area is an adverse effect under Section 106 of the National Historic Preservation Act. • Adversely affect a contributing resource to the Seward Park Historic District and Designed Landscape by removing bulkhead during construction.	• Improved historic character by removal of trees near Parking Lot 2.	• None	• None	• Transfer UPARR protection to area along Lake Washington shoreline. • Replace tennis courts following construction. • Maintain shoreline protection function of bulkhead using natural looking features more in keeping with Olmsted principles. • Likely, visually screen aboveground features with landscaping. • Follow procedures in RCW 68.60: Abandoned and Historic Cemeteries and Historic Graves, and RCW 27.44: Indian Graves and Records if human remains are discovered during project-related construction, maintenance, or operation activities. • Implement inadvertent discovery plan, as provided in Section 7.5 of the Cultural Resources Inventory report. In summary, if evidence of cultural artifacts or human remains, either prehistoric or historic, is encountered during excavation, work in that immediate area would be suspended and the find would be examined and documented by a professional archaeologist in consultation with SHPO and NPS.
Aesthetics, Light, and Glare	• Alter the visual character of the parks. • Potentially introduce new sources of light and glare.	• Rebuilt tennis courts, rebuilt/resurfaced parking lots, new landscaping, new natural looking shoreline, hatches, and several aboveground features.	• Same as the Tennis Courts Alternative.	• Same as the Tennis Courts Alternative.	• None	• None	• Locate the majority of the facilities underground; keep aboveground features to a minimum and likely screen with vegetation. • Screen construction equipment staging areas to buffer views of construction equipment and materials, where feasible. • Re-vegetate areas disturbed during construction. • Locate and aim any artificial lighting away from adjacent roadways and residential areas; use minimum wattage necessary to provide the necessary illumination.
Habitat, Wildlife, and Fish	• Disturb 1.43 acres of upland habitat. • Remove 43 trees, including 2 “exceptional” trees. • Prevent access to habitat within the limits of construction. • Water quality impacts to aquatic habitat and fish. • Burial of benthic aquatic invertebrates.	• Improve aquatic food web by improving water quality. • Improve shoreline habitat.	• Disturb 1.36 acres of upland habitat. • Remove 26 trees, including 10 “exceptional” trees. • Prevent access to habitat in the construction area. • Water quality impacts to aquatic habitat and fish. • Burial of benthic aquatic invertebrates.	• Same as the Tennis Courts Alternative.	• None	• Continued water quality impacts to aquatic habitat and fish due to continued sewage overflows.	• Limit work in Lake Washington during specific seasonal windows (July 16 – December 31) to avoid adverse impacts to fish. • Limit construction disturbances to the minimum area needed, the shortest duration, and the greatest distance away from water bodies, as practicable. • Develop and implement a Construction Stormwater and Erosion Control Plan (CSECP), including a Stormwater Pollution Prevention Plan (SWPPP) and Spill Prevention and Countermeasures Plan (SPCP), to reduce the potential for sediment, waste materials, construction-related leaks, and spills to contaminate surface, ground, and runoff water. • Implement measures to contain turbidity (e.g., sheeted trenches, silt curtains) for in-water work related to the CSO pipe replacement. • Take appropriate precautions when storing equipment, hazardous fuels, and other materials used in construction of the project. • Provide an emergency response plan in accordance with the SPU spill prevention plan and know proper hazardous material storage, handling, and emergency procedures, including spill notification and response requirements. • Implement appropriate BMPs from the City of Seattle’s Stormwater Code SMC 22.800 – 22.808, Director’s Rule: 2009-004 SPU/16-2009 DPD, and Volume 2 Construction Stormwater Control Technical Requirements Manual to control erosion and sediment transport from the project site during construction. • Provide water quality treatment as necessary to improve the quality of stormwater flows from adjacent impervious surfaces. • Develop and implement a revegetation plan in accordance with the Seward Park Vegetation Management Plan.

Resources	Tennis Courts Alternative		Parking Lot Alternative		No Action Alternative [1]		Measures to Reduce or Eliminate Potential Impacts
	During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)	
Transportation	• Increase traffic volume and delays (maximum delay of 3.5 seconds at an intersection) from construction. • Potentially damage roads. • Impact to bicyclists.	• None	• Same as the Tennis Courts Alternative.	• None	• None	• None	• Schedule the construction of project elements so they do not overlap, when feasible, to reduce the number of vehicle trips occurring at one time. • Provide information at Seward Park and on SPU and Seattle Parks websites regarding alternate routes drivers and bicyclists could use to avoid construction traffic. • Perform a condition assessment on the construction route prior to the proposed project so roads could be restored to their prior condition or better.
Water Resources	• Potentially introduce sediment and other pollutants via runoff or disturbance of potentially contaminated soil near the existing CSO outfall pipe. However, uncontrolled discharges will be avoided by mitigation measures (see far right column). • Temporary localized lowering of groundwater table near CSO storage tank.	• Improved water quality due to reduced frequency and volume of CSO events and the addition of stormwater treatment in Parking Lot 1.	• Same as the Tennis Courts Alternative.	• Same as the Tennis Courts Alternative, except the stormwater treatment would be for Parking Lot 2 and part of its access road.	• None	• Continued water quality impacts due to continued sewage overflows.	• Limit construction disturbances to the minimum area needed, the shortest duration, and the farthest distance away from water bodies, as practicable. • During construction, implement Best Management Practices (BMPs), as identified in the City of Seattle's Stormwater Code SMC 22.800 – 22.808, Director's Rule: 2009-004 SPU/16-2009 DPD, and Volume 2 Construction Stormwater Control Technical Requirements Manual to control erosion and sediment transport from the project site. Typical measures include silt fencing, plastic sheeting, and straw wattles to prevent sediment discharge. • Develop and implement a Construction Stormwater and Erosion Control Plan (CSECP), including a Stormwater Pollution Prevention Plan (SWPPP) and Spill Prevention and Countermeasures Plan (SPCP) to reduce the potential for sediment, waste materials, construction-related leaks, and spills to contaminate surface, ground, and runoff water. • Provide water quality treatment as necessary to improve the quality of intercepted stormwater flows from adjacent impervious surfaces. • Re-vegetate disturbed shorelines.
Air Quality, Odor, and Climate Change	• Generate particulate matter, carbon monoxide, and nitrogen dioxide. • Generate construction odors. • Produce greenhouse gases.	• Potentially generate sewer odors. • Produce greenhouse gases.	• Same as the Tennis Courts Alternative, except quantities generated would be slightly different.	• Same as the Tennis Courts Alternative.	• None	• None	• Follow best management practices for controlling fugitive dust. • Minimize odors by incorporating odor control and automated flushing systems into the design of the CSO storage tank, minimizing the time combined sewage is stored in the tank, maintaining the air space in the tank at slightly negative pressure, providing odor control, and scheduling maintenance of the odor control system during cold temperatures and periods of low flow. • Encourage practices that reduce greenhouse gas emissions such as limiting idling of equipment, encouraging construction workers to carpool, and buying products manufactured/produced locally.
Geology	• Vibration or ground movement (higher potential impacts to residences compared to park facilities). However, with proposed mitigation measures (see far right column) implemented, SPU does not anticipate damage to nearby structures.	• None	• Same as the Tennis Courts Alternative, except excavated quantities would be slightly different and the potential for vibration and ground movement would be higher at nearby park facilities compared to nearby residences.	• None	• None	• None	• Use construction methods that do not produce significant vibration, such as secant pile walls (vertical elements drilled into place) or drilled/grouted shoring systems, to not impact adjacent structures. • Specify threshold vibration levels in the contract documents. • Perform pre and post-construction surveys of nearby structures and utilities. • Implement a monitoring program to measure vibration levels and any movement of nearby existing structures. • If blasting is used for excavation, specify a threshold value for air overpressure based on acceptable levels; control the powder factor, the charge weight per delay, and delay pattern; and provide proper stemming, blasting mats, and proper relief for each blast. • Dispose of excavated soil at an appropriate, permitted, offsite disposal facility.

Resources	Tennis Courts Alternative		Parking Lot Alternative		No Action Alternative [1]		Measures to Reduce or Eliminate Potential Impacts
	During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)	
Land and Shoreline Uses	• None	• The presence of the project facilities would result in a dedicated use of the sub-surface area and would restrict certain future uses in the surface area.	• None	• Same as the Tennis Courts Alternative.	• None	• None	• Return the project area affected during construction to pre-construction conditions or better.
Noise and Environmental Hazards	• Increased noise levels at both nearby residences and park facilities (however, higher noise levels at residences compared to park facilities). • Potentially release hazardous material.	• Increased noise levels at nearby residences and park facilities (however, higher noise levels at residences compared to park facilities).	• Same as the Tennis Courts Alternative, except for noise impacts, noise levels would be higher at nearby park facilities compared to nearby residences.	• Same as the Tennis Courts Alternative, except for noise impacts, noise levels would be higher at nearby park facilities compared to nearby residences.	• None	• None	• Encourage noise-reducing measures such as using sound-control devices on equipment, prohibiting equipment with unmuffled exhaust, minimizing idling time of equipment and vehicles, and installing acoustic barriers around stationary sources of construction noise. • Conduct on-site noise monitoring to ensure compliance with SMC provisions, if necessary. • Perform sediment characterization sampling and analysis near the existing CSO outfall for the potential contaminants that may include the following parameters: petroleum hydrocarbons, volatile organic compounds, semi-volatile organic compounds, and priority pollutant metals. If contaminants are found, limit their migration by best management practices, such as use of underwater silt curtains and sheet piles, and disposing of sediments in an approved offsite facility. • Develop and implement plans for pollution prevention, to control and manage spills, and for sediment handling, testing, and disposal.
Energy and Natural Resources	• Consumption of fuel and electricity. • Use of petroleum, rock, gravel, and sand, metals, water, and plants.	• Consumption of fuel and electricity. • Use of petroleum and metals.	• Same as the Tennis Courts Alternative.	• Same as the Tennis Courts Alternative.	• None	• None	• Encourage efficient energy use, such as limiting idling equipment, and encouraging construction workers to carpool. • Acquire natural resources, such as backfill material and concrete mix, from local stockpiles to reduce the energy consumption associated with transportation of those materials. • Size equipment used within the facility to maximize energy efficiency.
Public Services and Utilities	• Potentially reduced response times for police, fire, and safety services.	• Use of water. • Improved sewer system. • Treated storm water. • Use of electricity.	• Same as the Tennis Courts Alternative.	• Same as the Tennis Courts Alternative.	• None	• None	• Notify law enforcement and fire and safety agencies of estimated truck trips and schedules so they can adjust their service area and routes as needed to maintain response times. • Notify law enforcement and fire/emergency services providers in advance when access to Seward Park would be reduced. • Recycle and compost construction debris to the extent possible to minimize solid waste.
Environmental Justice	• Potential to disproportionately affect the more diverse minority population that uses Seward Park.	• No disproportionate impacts.	• Same as the Tennis Courts Alternative.	• Same as the Tennis Courts Alternative.	• None	• None	• Measures implemented for the other resources would also benefit environmental justice populations.

[1]For the purpose of this table, the focus of the No Action Alternative is not building the CSO storage tank. While the existing CSO outfall would be replaced under the No Action Alternative as part of the SPU Outfall Rehabilitation Program, the impacts of the CSO outfall replacement would be addressed by a separate SEPA environmental review process that would be conducted prior to the CSO outfall replacement.

2 Introduction to the Project

2.1 What is the purpose and need of the Henderson Basin 44 CSO Reduction Project?

The purpose of the Henderson Basin 44 CSO Reduction Project is to reduce the number and volume of untreated CSO events in Basin 44, thus reducing the amount of untreated wastewater entering Lake Washington. Basin 44 is in southeast Seattle and extends along the western shoreline of Lake Washington (see Figure 2-1).

Sewers in the project area carry raw sewage away from the neighborhood for treatment at King County's West Point and South treatment plants before discharge to Puget Sound. When it rains, these same sewers also carry untreated stormwater from neighborhood roofs, foundation drains, and some streets. During heavy rains, if the amount of raw sewage and untreated stormwater exceeds the sewer system capacity, the excess flows discharge into Lake Washington. These "Combined Sewer Overflows" or "CSOs" are a public health and environmental concern. The purpose of the Henderson Basin 44 CSO Reduction Project is to reduce the number and volume of these sewage overflows into Lake Washington.

The proposed project consists of building a 2.4 MG underground storage tank to store excess sewage and stormwater flows in Basin 44 during heavy rain events to prevent excess flows from discharging into Lake Washington. The proposed project would be located in Seward Park, which is owned and managed by Seattle Parks, and includes additional infrastructure, shoreline, and landscape improvements. Detailed project descriptions are in Chapter 3 Alternatives.

The proposed project is needed to protect public health, improve water quality in Lake Washington, and comply with regulations by reducing the number of CSO events in Basin 44 to a long-term average of no more than one untreated discharge per year per outfall.

2.2 What is a CSO?

A combined sewer overflow, or CSO, is a discharge of untreated sewage and stormwater into a receiving body of water, such as Lake Washington. CSOs are a public health concern because they carry pollutants, primarily untreated sewage and stormwater runoff, into the receiving water bodies. CSOs are related to the type of sewer system. The City has three types of sewer systems:

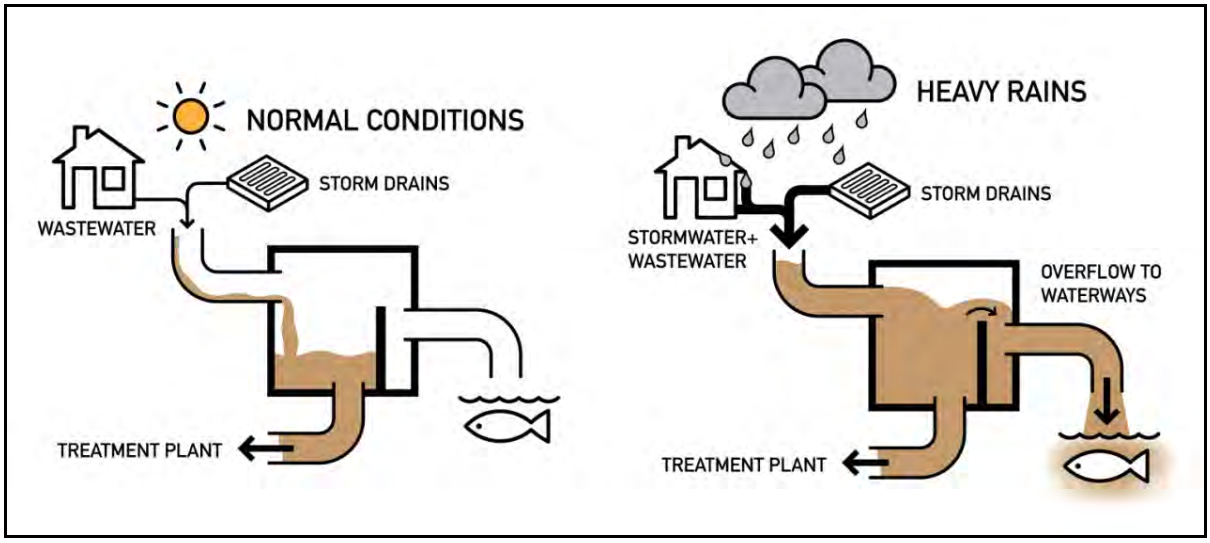
- **Combined Sewer Systems** convey both sewage and stormwater in the same pipe. The sewage is generated from homes and businesses. The stormwater is generated from sources such as streets, parking lots, roof drains, and foundation drains.

  Under dry weather conditions, the flows in the combined sewer system, which are primarily sewage, are sent to a wastewater treatment plant. The treated effluent is discharged into receiving water bodies. Under wet weather conditions, sewage and stormwater both enter the combined sewer system. As long as the flows are within the capacity of the combined sewer system, all of the flows are conveyed to a wastewater

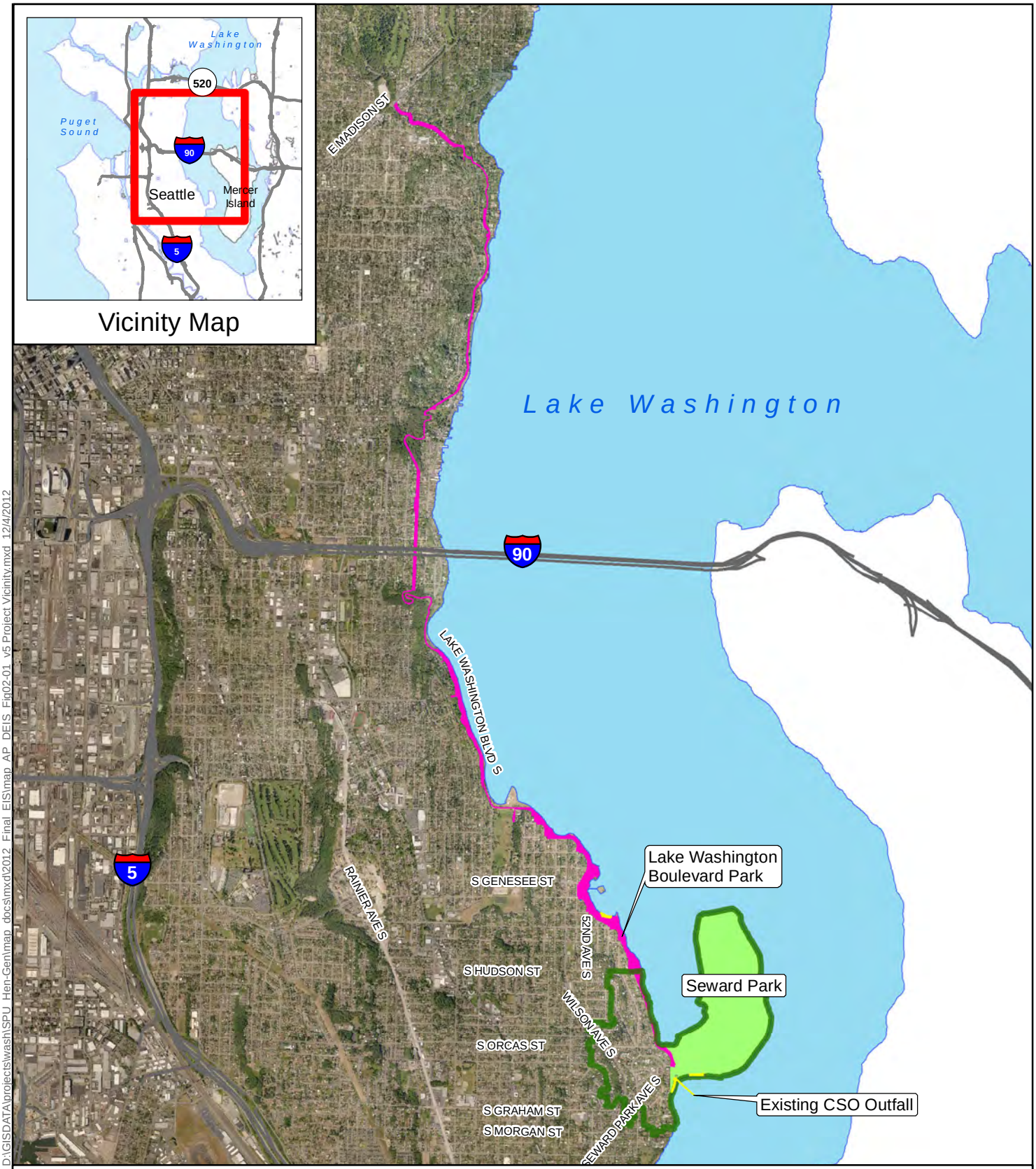
treatment plant. However, if flows in the combined sewer exceed the capacity of the system, the excess flow of untreated sewage and stormwater discharges into receiving water bodies through permitted outfalls. This discharge is called a "Combined Sewer Overflow" or "CSO."

- **Separated Sewer Systems** convey sewage and stormwater in two distinct systems: a sanitary sewer system and a drainage system. The sanitary sewer system primarily collects sewage, and conveys it to a treatment plant. The drainage system collects only stormwater, and conveys it directly to local water bodies or, in some cases, partially treats it and then sends it to local water bodies.
- **Partially Separated Systems** are hybrid systems where sewage and some stormwater flows are handled in one system, while other stormwater flows are conveyed separately. In Seattle, stormwater from private property (such as roof drains and private parking lots) typically flows to the combined sewer system. Stormwater from public property (such as streets and rights-of-ways) typically flows to separate storm drains that convey the stormwater directly to receiving water bodies.

The two images below depict what occurs under normal conditions and under heavy rain conditions in combined sewer systems.



In a combined sewer system, CSO events may occur during heavy rains.



Legend

- Lake Washington Blvd Park (to Madison St.)
- Seward Park
- Basin 44
- Potential Project Areas

0 2,000 4,000 8,000 Feet

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

PROJECT VICINITY

JANUARY 2013 | **FIGURE 2-1**

This page was left intentionally blank.

2.3 How are CSOs regulated?

The federal Clean Water Act[1] requires that municipalities obtain authorization to discharge wastewater (like CSOs) into surface water bodies. To implement this authorization, the Clean Water Act established the National Pollutant Discharge Elimination System (NPDES) Permit program. In Washington, the Washington State Department of Ecology (Ecology) administers the NPDES Permit program. Ecology issued SPU's most recent CSO NPDES permit (WA-033168-2) in October 2010. This permit allows wet weather discharges from certain permitted CSO outfalls.

Washington State law (Revised Code of Washington [RCW] 90.48.480[2]) requires local governments to achieve a reasonable reduction in CSOs at the earliest possible date. Per Washington regulations (WAC 173-245-240), the greatest reasonable reduction is defined as a long-term average of no more than one untreated discharge per year per outfall. In October 2010, Ecology and SPU signed Agreed Order 8040, stipulating that the deadline for achieving the greatest reasonable reduction is December 31, 2025. On an annual basis, SPU is required to report the duration and volume of each CSO discharge during the most recent year, steps taken during the most recent year to reduce CSOs, the CSO outfalls now meeting the definition of greatest reasonable reduction (a long-term average of no more than one untreated discharge per year per outfall), and work planned for the next year to reduce CSOs. In 2015, SPU is required to submit an updated plan to Ecology, describing the remaining projects that will be implemented to reduce and bring CSOs under control.

2.4 Why is the proposed project needed now?

Basin 44 exceeds the regulatory requirement of a long-term average of no more than one untreated discharge per year per outfall, and it discharges into a highly-sensitive receiving water body, Lake Washington. From 1998 to 2011, Basin 44 had approximately 17 CSO events per year, with an average annual volume of approximately 37 MG of untreated CSO discharge. SPU's current NPDES permit requires that SPU begin construction of a project to reduce CSOs from Basin 44 by May 31, 2015.

2.5 What makes up the sewer system in Basin 44?

The sewer system in Basin 44 is considered a partially separated system. The sewer system was constructed in the 1910s and 1920s as combined sewers, and modified so stormwater from public streets and parking lots is conveyed in storm drains instead, leaving only the stormwater runoff from private property in the combined sewers (see Figure 2-2).

SPU built a CSO storage facility in Basin 44 in 1985. The facility, called "CSO Facility 8," provides approximately 50,000 gallons of excess flow storage in two parallel, large-diameter (72- and 84-inch) pipes and is located in Seward Park, adjacent to the tennis courts. Control

[1] 33 United States Code (U.S.C.) § 1251 et seq. (1972): Clean Water Act

[2] RCW 90.48.480: Reduction of Sewer Overflows – Plans – Compliance Schedule

structures near the storage pipes route flows to treatment facilities (either King County's West Point Treatment Plant or South Treatment Plant), to storage, or to a CSO outfall, depending on the volume of flows. Basin 44 has a CSO outfall, built in 1932, that consists of a 24-inch-diameter wood pipe that extends approximately 680 feet from shore.

2.6 How was the preferred alternative identified and how was the public involved in the process?

SPU identified and analyzed a number of alternatives to control CSOs in the vicinity of Seward Park (Basin 44). The process of identifying and analyzing alternatives was completed in conjunction with a public participation process that began in Summer 2010. The process was as follows:

- Step 1 – Identify and Evaluate High-level CSO Control Options
- Step 2 – Identify and Evaluate Storage Themes and Sewer Separation/Natural Drainage Systems
- Step 3 – Identify and Evaluate General Storage Locations
- Step 4 – Identify and Evaluate Site-Specific Storage Alternatives

Step 1 – Identify and Evaluate High-Level CSO Control Options

In 2010, SPU began with identifying four high-level CSO control options for Basin 44. A "CSO control option" is a technology that can be implemented to reduce CSOs. The four high-level CSO control options were: treatment, storage, sewer separation and Natural Drainage Systems, and flow transfers. These control options were evaluated for costs, technical feasibility, and community impacts. The evaluation identified storage and sewer separation/Natural Drainage Systems as the only viable CSO control options. SPU held a public workshop on November 18, 2010, to present the options and their evaluation.

Step 2 – Identify and Evaluate Storage Themes and Sewer Separation/Natural Drainage Systems

SPU identified and evaluated sewer separation/Natural Drainage Systems and three different storage themes: tunnel storage, pump and storage in Martha Washington Park, and storage in the vicinity of Seward Park. The storage themes and the sewer separation/Natural Drainage Systems option were evaluated for their costs and impacts. SPU held three public workshops on December 14, 2010, January 19, 2011, and March 10, 2011, to discuss the evaluation. The evaluation identified storage in the vicinity of Seward Park as the viable storage theme for Basin 44.

Step 3 – Identify and Evaluate General Storage Locations

SPU identified three general storage locations in the vicinity of Seward Park:

- Storage underneath private property
- Storage underneath Lake Washington Boulevard South
- Storage in Seward Park

D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EISmap_AP_DEIS_Fig02-02_v5_sewer_system.mxd 12/4/2012

Legend

- SPU Drainage Pipe
- SPU Sanitary Sewer Pipe
- SPU Combined Sewer Pipe
- Existing CSO Storage
- Basin 44
- Potential Project Areas
- Road

0 300 600 1,200 Feet

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

EXISTING SEWER SYSTEM BASIN 44

JANUARY 2013 | **FIGURE 2-2**

This page was left intentionally blank.

For each of the general storage locations, representative locations were identified to provide an example of where the storage facility would be located and its costs and impacts. Through the public process and SPU's evaluation of the costs and benefits, SPU selected storage in Seward Park as its general storage location. The public workshops held on December 14, 2010, January 19, 2011, and March 10, 2011 included the evaluation of the general storage location.

Step 4 – Identify and Evaluate Site-Specific Storage Alternatives

In Summer 2011, SPU identified and developed two site-specific alternatives for storage in Seward Park. Those two alternatives were the Tennis Courts Alternative and the Parking Lot Alternative. The two site-specific alternatives were presented at a scoping meeting for the Draft EIS on June 7, 2011. (See following paragraph for details on the scoping process.) Following the scoping meeting, SPU analyzed the environmental impacts of the alternatives and issued a Draft EIS for public review.

Prior to the EIS scoping meeting and in accordance with the State Environmental Policy Act (SEPA), SPU issued a Determination of Significance and Request for Comments on Scope of EIS (DS) on May 26, 2011 (see Appendix A). The DS described the purpose of the proposed project, the three alternatives that would be considered in an EIS (Parking Lot Alternative, Tennis Courts Alternative, and No Action Alternative), and the environmental elements that would be discussed in the EIS. The DS invited agencies, affected tribes, and members of the public to comment on the scope of the EIS; provided the date, time, and location of the public scoping meeting; provided the name, address, email address, and phone number of the SEPA Responsible Official; and directed people to respond with their comments via email or in writing by June 16, 2011 to the SEPA Responsible Official. Additional SEPA required public notification included the following:

1. The DS was posted on the Seattle Department of Planning and Development's Land Use Bulletin on May 26, 2011.
2. The DS was posted on the Washington State Department of Ecology's SEPA Register on May 26, 2011.
3. The DS was published in the Daily Journal of Commerce on May 26, 2011.
4. The DS was published in the South Seattle Beacon on June 1, 2011.
5. The DS was mailed to agencies with jurisdiction and to organizations and individuals who had provided written request for such notices (see DS Distribution List in Appendix A).
6. The DS was available for public review at SPU's main office on the 49th floor of the Seattle Municipal Tower.

Additional voluntary public outreach included the following:

1. The DS was posted on SPU's North Henderson project website.
2. The DS was mailed to additional organizations SPU assumed might have an interest in the project (see DS Distribution List in Appendix A).

3. Postcards were mailed to every residence in Basins 44 and 45 (see map in Appendix A, approximately 1,700 total), notifying residents of the EIS scoping process; the date, time, and location of the scoping meeting; and the address and deadline for submitting scoping comments.
4. One of the postcards also was posted on the project sign at Seward Park.
5. An email announcing the public scoping meeting was sent to people who had previously requested to be included on the North Henderson listserv to receive updates on the North Henderson CSO reduction projects.
6. A notice was posted on the City's online public outreach and engagement calendar.
7. Advanced meeting notice was provided in the Rainier Valley Post.
8. Meeting flyers were delivered to community centers, public libraries, synagogues, and post offices.
9. A community guide to the proposed project was developed for the scoping meeting to help explain the proposed project and the three alternatives to the public.
10. A comment form was developed for the scoping meeting, to help encourage meeting attendees to provide input and feedback.
11. Following the scoping meeting, the community guide and the comment form were posted on SPU's North Henderson project website.
12. Following the scoping meeting, a scoping summary report was prepared and posted on the SPU's North Henderson project website.

Fourteen people attended the scoping meeting, and eight people submitted comments. The scope of the EIS was adjusted to reflect scoping input, and the environmental impacts of each alternative were analyzed.

The environmental analysis indicated that both the Parking Lot Alternative and the Tennis Courts Alternative would have environmental impacts, some of which were the same for these two alternatives and some of which were not. Once the environmental analysis was complete, SPU identified the preferred alternative based on a review of the types of impacts and their significance. The Tennis Courts Alternative was identified as the preferred alternative because: (a) Seward Park is a destination park; visitors from all over the Seattle area come to the Park to enjoy its many amenities; (b) the Tennis Courts Alternative would have less short-term (construction) impacts on recreation than the Parking Lot Alternative; and (c) other environmental impacts were not significant as defined by SEPA (i.e., there was not a reasonable likelihood of more than a moderate adverse impact on environmental quality). SPU then prepared a Draft EIS summarizing the findings of the environmental analysis and indicating the preferred alternative.

SPU issued a Notice of Availability of the Draft EIS on September 17, 2012 (see Appendix A). The Notice of Availability described the purpose of the proposed project and the three alternatives that were considered in the Draft EIS (Parking Lot Alternative, Tennis Courts Alternative, and No Action Alternative). The Notice of Availability invited agencies, affected tribes, and members of the public to comment on the Draft EIS; provided the date, time, and location of the Draft EIS public hearing; provided the name, address, email address, and phone number of the project manager and the SEPA Responsible Official; and directed people to respond with their comments via email or in writing by October 17, 2012 to the SEPA Responsible Official. Additional SEPA required public notification included the following:

1. The Notice of Availability was posted on the Seattle Department of Planning and Development's Land Use Bulletin on September 17, 2012.
2. The Notice of Availability was posted on the Washington State Department of Ecology's SEPA Register on September 17, 2012.
3. The Notice of Availability was published in the Daily Journal of Commerce on September 17, 2012.
4. The Notice of Availability was published in the Seattle Times on September 17, 2012.
5. The Notice and the DEIS were mailed to agencies with jurisdiction, organizations and individuals who requested copies, and organizations and individuals who commented during the scoping process (see Draft EIS Distribution Lists in Appendix A).
6. The Draft EIS was available for public review at SPU's main office on the 49th floor of the Seattle Municipal Tower and the Seattle Central Library.

Additional voluntary public outreach included the following:

1. The Notice of Availability and Draft EIS were posted on SPU's North Henderson project website.
2. The Notice of Availability, or the Notice of Availability and Draft EIS, were mailed to additional individuals and organizations SPU assumed might have an interest in the project (see Notice of Availability and Draft EIS Distribution Lists in Appendix A).
3. Postcards were mailed to every residence in Basins 44 and 45 (see map in Appendix A, approximately 1,700 total), notifying residents of the date, time, and location of the Draft EIS public hearing; providing the address and deadline for submitting comments on the Draft EIS; and providing the address of SPU's North Henderson project website for more information.
4. An email announcing the public hearing was sent to people who had previously requested to be included on the North Henderson listserv to receive updates on the North Henderson CSO reduction projects.
5. SPU staff contacted the individuals whose property adjoins the tennis courts to ensure they knew about the Draft EIS and the public hearing.

Twenty-eight people attended the public hearing and nine individuals testified. Comments also were received by email and by US Postal Service from nineteen individuals, organizations, and agencies. The comments and responses are included in Appendix B.

In 2013, there will be an additional opportunity for the public to provide input on the Tennis Courts Alternative and the Parking Lot Alternative at a City Council public hearing to address the requirements of Seattle City Ordinance 118477 (aka, "Initiative 42"). Per Initiative 42, the Seattle City Council must hold a public hearing prior to making a determination whether there is "no reasonable and practical alternative" to constructing the facility in Seward Park. Similarly, the City Council will decide which of the two locations within Seward Park (tennis courts vs. parking lot) is preferred. Finally, the City Council will make a determination whether or not the proposed underground storage tank is "compatible with park use." SPU expects the City Council to hold the public hearing and make these determinations in 2013.

2.7 Why and how was this Environmental Impact Statement developed?

SPU developed this Environmental Impact Statement (EIS) to comply with SEPA[3], which requires state and local agencies to consider the likely environmental consequences of a proposal before approving or denying the proposal. Under SEPA rules[4], a lead agency is designated as responsible for complying with SEPA requirements. SPU is serving as the lead agency for the Henderson Basin 44 CSO Reduction Project, and has determined that this proposal could have a significant adverse impact on the environment. This was recorded in the Determination of Significance (DS) that SPU issued for the proposed project on May 26, 2011 (SPU 2011a). Because there could be a significant impact on the environment and a DS was issued, SEPA requires that an EIS be prepared.

The primary purpose of an EIS is to ensure that SEPA's policies are an integral part of the ongoing programs and actions of state and local government[5]. State and local codes[6] list the required content of an EIS and identify elements of the environment for potential discussion.

Scoping is the first step in the EIS process. The purpose of scoping is to narrow the focus of the EIS to significant

The project's potential impact on recreation is a key element of the analysis in the EIS.

[3] Chapter 43.21C RCW: State Environmental Policy Act

[4] Chapter 197-11 WAC: SEPA Rules; SMC 25.05: Environmental Policies and Procedures

[5] WAC 197-11-400: Purpose of an EIS; SMC 25.05.400A: Purpose of an EIS

[6] WAC 197-11-440: EIS contents; WAC 197-11-444: Elements of the environment; SMC 25.05.440 EIS contents; SMC 25.05.444: Elements of the environment

environmental issues, to eliminate insignificant impacts from detailed study, and to identify alternatives to be analyzed in the EIS. During the scoping process (SPU 2011b), it was determined that the natural and built environmental elements listed in Table 2-1 would be included for evaluation of affected environment and impacts in the EIS with more detailed analyses conducted for recreation and transportation.

Table 2-1. Environmental Elements Included in EIS

Natural Environment	Built Environment
• Geology • Air, Odor, and Climate Change • Water Resources • Habitat, Wildlife, and Fish • Energy and Natural Resources	• Recreation • Transportation • Noise and Environmental Hazards • Land and Shoreline Uses • Cultural Resources • Public Services and Utilities • Environmental Justice • Aesthetics, Light, and Glare

2.8 What is the federal nexus for this project?

As discussed in Chapter 1, Seward Park previously received federal grant funding from the NPS under UPARR for improvements in several areas of the park (see Appendix C for more information regard UPARR). If the proposed project is to proceed, UPARR requirements must be met. Other lands must be placed under the protection of the UPARR grant or other improvements must be implemented. SPU would meet this condition by requesting that the NPS transfer the UPARR protection to other land located in Lake Washington Boulevard Park. The NPS must examine the potential impacts to recreation from the proposed transfer of UPARR protection to a new location, and any impacts this action would have on the rest of Seward Park.

Specifically, Section 1010 of the Urban Park and Recreation Recovery Act of 1978, as amended, Public Law 95-625, protects recreational sites rehabilitated through the UPARR program:

> *No property improved or developed with assistance under this chapter shall, without the approval of the Secretary, be converted to other than public recreation uses. The Secretary shall approve such conversion only if he finds it to be in accord with the current local park and recreation recovery action program and only upon such conditions as he deems necessary to assure the provision of adequate recreation properties and opportunities of reasonably equivalent location and usefulness.*

Based on coordination with NPS, it is anticipated that NPS would adopt this SEPA EIS to satisfy the requirements of the National Environmental Policy Act (NEPA 42 U.S.C. § 4321) created by the federal action of transferring UPARR protection. Section 40 CFR Part 1506.3, Adoption, describes adopting a SEPA EIS.

Chapter 3 Alternatives discusses this transfer of the UPARR grant protections in more detail.

2.9 What are direct, indirect, and cumulative impacts?

Direct impacts are caused by the project action and occur at the same time and place (40 CFR 1508.8(a), SMC 25.05.670). Direct impacts can be either short-term and temporary or long-term. For this EIS, the direct impact analysis for each discipline is divided into during construction and after construction.

Indirect impacts are caused by the proposed project and occur later in time or are farther removed in distance but are still reasonably foreseeable (40 CFR 1508.8(b), SMC 25.05.670). Indirect impacts result from one project but unlike direct impacts may involve a chain of cause-and-effect relationships that can take time to develop and occur at a distance from the proposed project site. Oftentimes, indirect impacts on a resource are the result of changes to another resource in the area, so cross-resource interactions must be considered as well. This makes indirect impacts difficult to predict and usually requires a qualitative estimate more general than estimates of direct impacts.

Cumulative impacts are impacts on the environment that would result from the incremental impacts of the proposed project when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor, but collectively significant, actions taking place over a period of time (40 CFR 1508.7). A cumulative impact is also the proposed project's direct and indirect impacts on a particular resource, combined with the past, present, and future impacts of other human activities on that same resource. The result is the likely expected future condition of the resource when all of the external factors known or likely to affect it are taken into account. Chapter 17 Cumulative Impacts includes additional information on cumulative impacts.

3 Alternatives

3.1 What alternatives are analyzed in this EIS?

3.1.1 Tennis Courts and Parking Lot Alternatives

The Tennis Courts and Parking Lot Alternatives consist of the following four main elements (see Figure 1-1). The two alternatives would be similar; the main difference would be the location of the CSO storage tank and shoreline treatment.

- An underground 2.4 MG CSO storage tank and associated infrastructure
- Shoreline treatment
- Replacement of an existing CSO outfall pipe
- Transfers of UPARR grant protections and upland landscaping enhancements

The first three elements are located in Seward Park. Figure 3-1 shows these elements for the Tennis Courts Alternative and Figure 3-2 shows these elements for the Parking Lot Alternative. The fourth element is located in a portion of Lake Washington Boulevard Park approximately one mile north of Seward Park near the intersection of Lake Washington Boulevard South and 53rd Avenue South (see Figure 3-3).

Location for the Tennis Courts Alternative

Location for the Parking Lot Alternative

3.1.1.1 CSO Storage Tank and Associated Infrastructure

The CSO storage tank and associated infrastructure include the following:

New CSO Storage Tank: A new, underground 2.4 MG CSO storage tank would be built in the southwest corner of Seward Park, next to Lake Washington. The CSO storage tank would be located under the tennis courts and an adjacent parking lot (Parking Lot 1) for the Tennis Courts Alternative and under a different parking lot (Parking Lot 2) for the Parking Lot Alternative. These two locations are approximately 300 feet apart.

For the Tennis Courts Alternative, the exterior dimensions of the tank would be approximately 390 feet long by 50 feet wide by 30 feet deep. For the Parking Lot Alternative, the exterior dimensions of the tank would be approximately 375 feet long by 50 feet wide by 30 feet deep. The difference in length between the alternatives is due to site conditions that require a slight bend in the tank for the Tennis Courts Alternative.

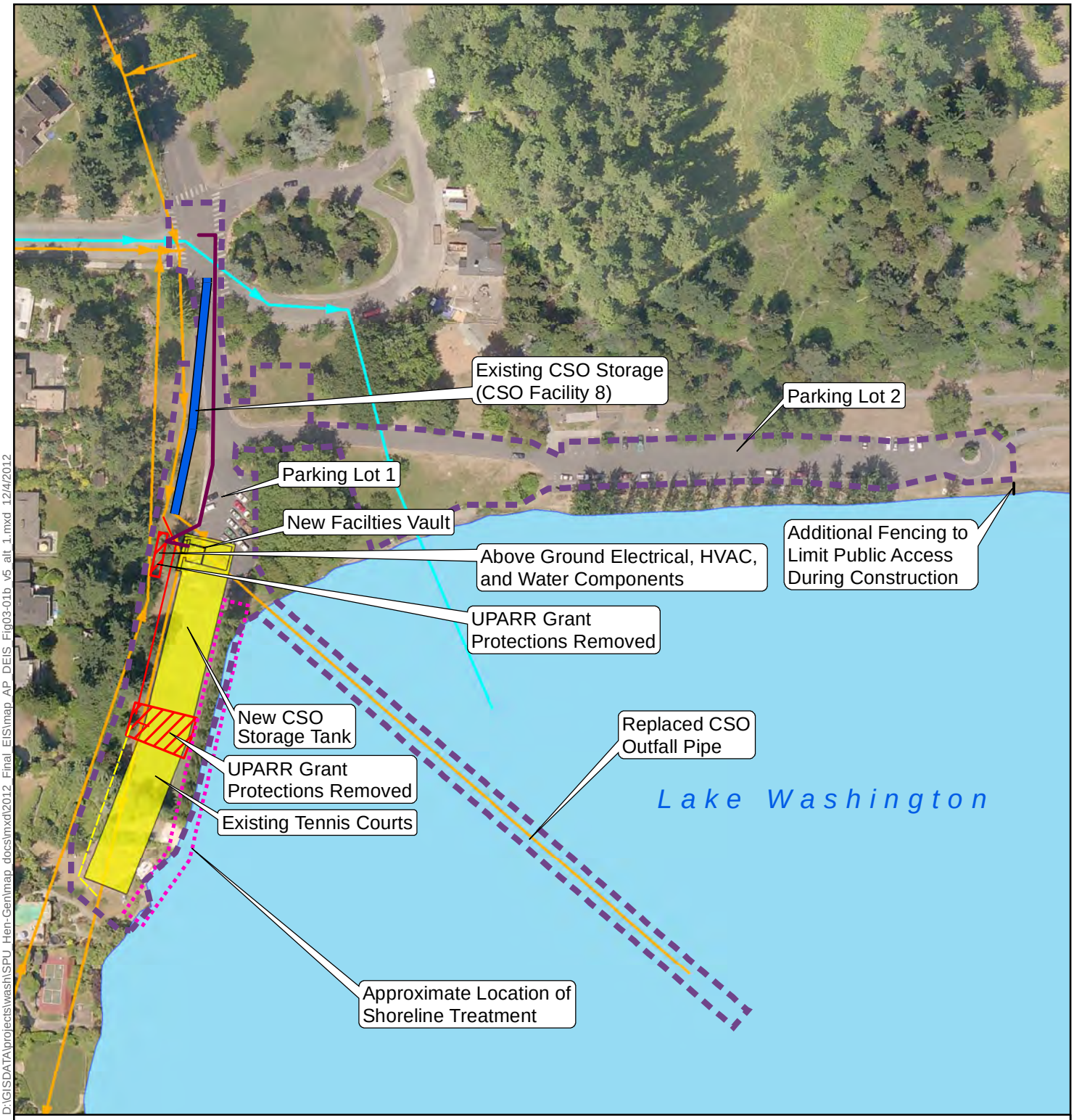
Access to the tank would be by hatches located between the two restored tennis courts. The size of the access hatches would range from approximately 2½ feet square to 3 feet wide by 6 feet long. This area would have the NPS' UPARR grant protections removed from it.

The required capacity of the tank was determined based on computer modeling and monitoring data that determined the volume of flows needed to be controlled to limit future CSO events to a long-term average of no more than one untreated discharge per year.

New Facilities Vault: An underground facilities vault attached to the CSO storage tank would contain odor control, mechanical, electrical, and control systems. The facilities vault would be attached to the northern end of the CSO storage tank for the Tennis Courts Alternative and to the eastern end of the CSO storage tank for the Parking Lot Alternative. Access to the vault would be by hatches and stairs from ground level in the respective parking lots. The size of the access hatches would range from approximately 2½ feet square to 4 feet wide by 14 feet long. The exterior dimensions of the facilities vault would be approximately 35 feet long by 50 feet wide. The depth from ground level to the vault floor would be approximately 10 feet.

New Aboveground Features: An area approximately 50 feet long by 15 feet wide (750 square feet) would contain several aboveground features. The area with the aboveground features would be just west of the facilities vault for the Tennis Courts Alternative and directly north of the facilities vault for the Parking Lot Alternative. This area would have the NPS' UPARR grant protections removed from it. The aboveground features would include the following:

- One electrical cabinet approximately 3 feet long by 1.5 feet wide by 6 feet high.
- Two heating, ventilation, and air conditioning (HVAC) air intakes approximately 3 feet long by 3 feet wide by 2 feet high.
- Two HVAC air exhausts approximately 3 feet long by 3 feet wide by 2 feet high.
- One odor control exhaust approximately 3 feet long by 3 feet wide by 2 feet high.
- An enclosure containing a reduced pressure backflow assembly associated with the potable water used to flush the tank, approximately 2.5 feet long by 1 foot wide by 1.5 feet high.



D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EIS\map_AP_DEIS_Fig03-01b_v5_alt_1.mxd 12/4/2012

Legend

- UPARR Grant Protections Removed
- Potential Limits of Construction
- Fence Outside Limits of Construction
- Existing CSO Storage
- Shoreline Treatment
- SPU Combined Sewer Pipe
- SPU Drainage Pipe
- New Combined Sewer Pipe
- Relocated Combined Sewer Pipe
- New Water Pipe

N

0 60 120 240

Feet

Seattle Public Utilities

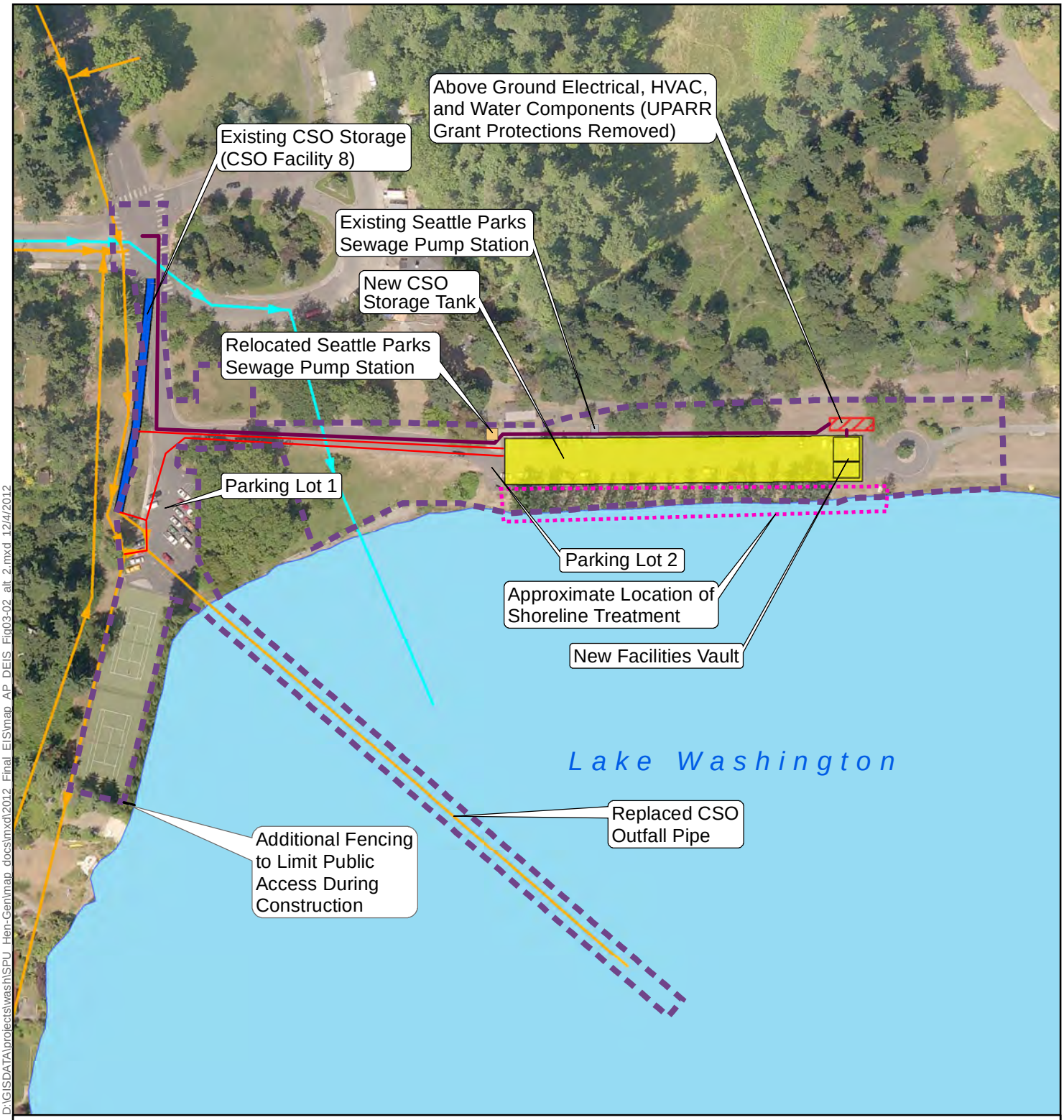
HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

TENNIS COURTS ALTERNATIVE
MAIN COMPONENTS IN SEWARD PARK

JANUARY 2013

FIGURE 3-1

This page was left intentionally blank.



D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EIS\map_AP_DEIS_Fig03-02_alt_2.mxd 12/4/2012

Legend

- UPARR Grant Protections Removed
- Potential Limits of Construction
- Fence Outside of Limits Construction
- Existing CSO Storage
- Shoreline Treatment
- SPU Combined Sewer Pipe
- SPU Drainage Pipe
- New Combined Sewer Pipe
- New Water Pipe

N

0 60 120 240 Feet

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

PARKING LOT ALTERNATIVE
MAIN COMPONENTS IN SEWARD PARK

JANUARY 2013 | **FIGURE 3-2**

This page was left intentionally blank.

D:\GIS\DATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012 Final EIS\map AP DEIS Fig03-03 v5 grant transfer.mxd 12/4/2012

Legend

- Area Receiving New UPARR Grant Protections
- Upland Landscaping Enhancements

0 25 50 100 Feet

N

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

UPARR REPLACEMENT AREA
MAIN COMPONENTS

JANUARY 2013 | **FIGURE 3-3**

This page was left intentionally blank.

New Sewer Pipes: New sewer pipes would convey flows to and from the new CSO storage tank. Flows would be conveyed to the CSO storage tank by gravity and pumped in force mains from the CSO storage tank. The gravity pipes would include approximately 250 feet of 36- to 48-inch-diameter sewer pipes for the Tennis Courts Alternative and 675 feet of 36-inch-diameter sewer pipes for the Parking Lot Alternative. The pressured pipes (force mains) would include approximately 30 feet of 12-inch-diameter pipe for the Tennis Courts Alternative and 625 feet of 18-inch-diameter pipe for the Parking Lot Alternative.

New Water Pipe: A new service pipe would be constructed to provide potable water to the CSO storage tank, so that the tank could be flushed and settled debris removed each time the tank was used to store combined sewage. The water pipe would extend from the intersection of South Juneau Street and Lake Washington Boulevard South to the aboveground features area and then into the facilities vault. The water pipe would be 3 inches in diameter and approximately 420 feet long for the Tennis Courts Alternative and 1,020 feet long for the Parking Lot Alternative.

Modifications to Existing Combined Sewer System: Several modifications would be made to the existing combined sewer system to work with the new CSO storage tank, facilities vault, and sewer pipe, as well as to better utilize the existing CSO storage at CSO Facility 8. The modifications would include changing the control structures that regulate and direct sewer flows, re-configuring sections of the sewer pipes, and replacing or adding maintenance holes. These modifications would all occur within the limits of construction in Seward Park shown on Figure 3-1 and Figure 3-2.

Relocate Existing Seattle Parks Pump Station (Parking Lot Alternative only): Seattle Parks operates a small sewer system in Seward Park to serve the restrooms in the park. As part of this system, there is a sewage pump station toward the northwest corner of Parking Lot 2. The pump station is a belowground structure; however, it has an access hatch that extends approximately two feet above ground and an aboveground electrical cabinet. For the Parking Lot Alternative only, SPU would remove the pump station and replace it with a new pump station located approximately 120 feet farther west, as well as move the Seattle Parks sewer pipes that are located in the footprint of Parking Lot 2. Figure 3-2 shows the locations of the existing and the relocated pump stations.

Seattle Parks Sewage Pump Station

3.1.1.2 Shoreline Treatment

Existing bulkhead near Parking Lot 2

For both the Tennis Courts and Parking Lot Alternatives, the proposed locations for the CSO storage tank are adjacent to the shoreline where there are existing bulkheads (or retaining walls) waterward to control beach erosion from wave action. SPU has options on how the shoreline could be restored after construction of the CSO storage tank. The options are described below and their advantages and disadvantages are shown in Table 3-1. Regardless of the option, construction of the storage tank would require removal of the existing shoreline trees.

The shoreline could be retained in its current state with the existing bulkhead and the area between the CSO storage tank and the lake could be planted with lawn and upland native landscaping.

Alternatively, SPU could remove the existing bulkhead and construct a new, rounded-gravel beach, with native beach and upland landscaping shoreward and large woody debris or other features anchored in the water to provide cover for fish. Between the beach and the new CSO storage tank, SPU could install a new wall made of stone, concrete, or similar material to protect the tank and the tennis courts or parking lot (depending on the alternative) from wave action. The shoreline treatment might be similar to one shown in the shoreline photos below.

The final configuration of the shoreline would be decided during the project's design phase, in coordination with Seattle Parks, the Army Corps of Engineers, the Muckleshoot Tribe, the Washington State Department of Fish and Wildlife (WDFW), the U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service, and other entities. The analysis in this EIS is based on removing the existing bulkhead because it is a conservative approach related to the impact analysis and the project schedule and budget.

Examples of shoreline treatment with removal of bulkhead

Table 3-1. Shoreline Treatment Options - Advantages and Disadvantages

Option	Advantages	Disadvantages
Leave Existing Bulkhead & Plant Lawn and Native Landscaping	• Reduces construction costs because the bulkhead would not be removed and the shoreline treatment would not be implemented. • Shortens construction time by approximately 6 months. • Does not reduce upland area. • Does not disturb aquatic habitat during construction except at the outfall location.	• Does not improve shoreline protection by replacing older bulkhead with new structure. • Does not provide enhanced aquatic habitat. • Leaves grounded stumps where the Poplar trees would be removed, which may limit opportunities for new vegetation.
Remove Existing Bulkhead & Construct Shoreline Treatment	• May improve shoreline protection by replacing older bulkhead with new structure. • Provides a more natural shoreline that may benefit aquatic wildlife, including ESA-listed species. • Allows for complete removal of the Poplar trees, which would not limit opportunities for new vegetation.	• Increases construction costs by adding bulkhead removal and shoreline treatment in the project. • Lengthens construction time by approximately 6 months. • May reduce upland area to create new, shallower shoreline. • Would disturb existing aquatic habitat during construction.

3.1.1.3 Replacement of the Existing CSO Outfall

The outfall pipe that conveys CSOs from Basin 44 into Lake Washington would be replaced. The existing 24-inch-diameter wood stave pipe is in poor condition and was previously recommended for replacement (SPU 2006). A decision was made to replace the entire CSO outfall pipe as part of the proposed project because a single construction project would be less disruptive to Seward Park than two separate construction projects.

The existing CSO outfall pipe is approximately 780 feet long and begins in a maintenance hole in Parking Lot 1. The outfall discharges approximately 19 feet below the average lake surface elevation. The outfall pipe consists of three sections: 1) buried upland (100 feet from maintenance hole to shoreline); 2) buried nearshore (100 feet from shoreline to 100 feet into the lake); and 3) lying on the bottom or buried offshore (580 feet farther into the lake).

The preliminary design concepts, which are subject to change during design, include the following:

- **Existing Outfall during Construction:** Continue use; both the Tennis Courts and Parking Lot Alternatives would require a temporary bypass of the upper section.
- **Existing Outfall after Construction:** Remove aboveground portions and abandon buried portions in place.
- **Location:** Within 15 feet of and parallel to the existing pipe.
- **Pipe Material:** Ductile iron or high-density polyethylene.
- **Excavation:** From shore and barge, use excavator and clamshell dredge; trenches with and without sheeting; treat dewatering water and discharge to the lake; use silt curtains; and dewater, test, and properly dispose of dredge materials.
- **Installation:** Piece-by-piece underwater or float and submerge the entire pipe.
- **Anchoring:** Combination of burial in engineered bedding and backfill, steel anchors, and concrete weights.
- **Energy Dissipation:** Energy dissipation pad (crushed rock) at the end of the pipe.

3.1.1.4 Transfer of UPARR Grant Protections and Upland Landscaping Enhancements

The NPS' UPARR program previously funded several park improvements within Seward Park by a federal grant. A condition of receiving the funds was that the property remains in recreational use in perpetuity. Three aspects of this project would conflict with that condition: 1) the presence of several permanent, aboveground features required for the proposed project; 2) the project facilities resulting in a dedicated use of the sub-surface area and restricting certain future uses in the surface area; and 3) a construction duration of more than 12 months.

The grant program allows for a transfer of the grant protections to another area not already associated with the grant. Therefore, the grant protections would be removed from a small area in Seward Park and transferred to a portion of Lake Washington Boulevard Park north of Seward Park near the intersection of Lake Washington Boulevard South and 53rd Avenue South (the UPARR replacement area).

UPARR Replacement Area

The areas in Seward Park that would have the grant protections removed are:

- The 750 square feet of area that would contain several aboveground features (Tennis Courts and Parking Lot Alternatives).
- The 3,100 square feet of area that contains access hatches between the tennis courts (Tennis Courts Alternative).

Figure 3-1 and Figure 3-2 show the locations that would have the grant protections removed as part of the Tennis Courts Alternative and the Parking Lot Alternative, respectively. Figure 3-3 shows the area receiving the transfer of grant protections, which is approximately 21,300 square feet. The replacement area is a passive park area similar to the areas being replaced, but it is much larger and would include upland landscape enhancements to replace invasive vegetation.

The upland landscaping enhancements in the UPARR replacement area would follow the Lake Washington Boulevard Vegetation Management Plan (Moller, Fischer, Silverman, and Andrews, 2010), would include removing invasive species and planting native shrubs and trees, and would maintain access and view opportunities to Lake Washington. The upland landscaping enhancements would occur both within and adjacent to the area where the grant protections would be added. Enhancing the landscaping is acceptable under the grant requirements.

3.1.2 No Action Alternative

Under the No Action Alternative, the CSO storage tank and associated infrastructure would not be built. Additionally, the shoreline treatment next to the CSO storage tank and the transfer of UPARR grant protections would not be implemented. The existing CSO outfall would eventually be replaced because it is in poor condition and was previously recommended for replacement. The outfall replacement is expected to occur between 2015 and 2020, under the SPU Outfall Rehabilitation Program.

Under the No Action Alternative, there would be no reduction in the number or volume of raw sewage discharges and the number of CSO events would continue to exceed the regulatory requirement of a long-term average of no more than one untreated discharge per year, in violation of federal and state law. Penalties for not meeting the regulatory requirement include fines and imprisonment.

3.2 When would construction occur?

For either the Tennis Courts Alternative or the Parking Lot Alternative, the construction is anticipated to take up to approximately two and a half years for the work at Seward Park and four to six weeks for the upland landscaping enhancements at the UPARR replacement area. Construction would begin in mid-2015 and continue through 2017. The City allows construction between 7 a.m. and 7 p.m. on weekdays and between 9 a.m. and 7 p.m. on weekends and holidays, per SMC 25.08.425. SPU would require the contractor to restrict workdays to non-holiday weekdays as much as reasonably possible. Work on holidays or weekends would be decided on a case-by case basis and would be coordinated with Seattle Parks with advance notice to park users. The construction schedule also would be coordinated to minimize impacts to major events such as Seafair.

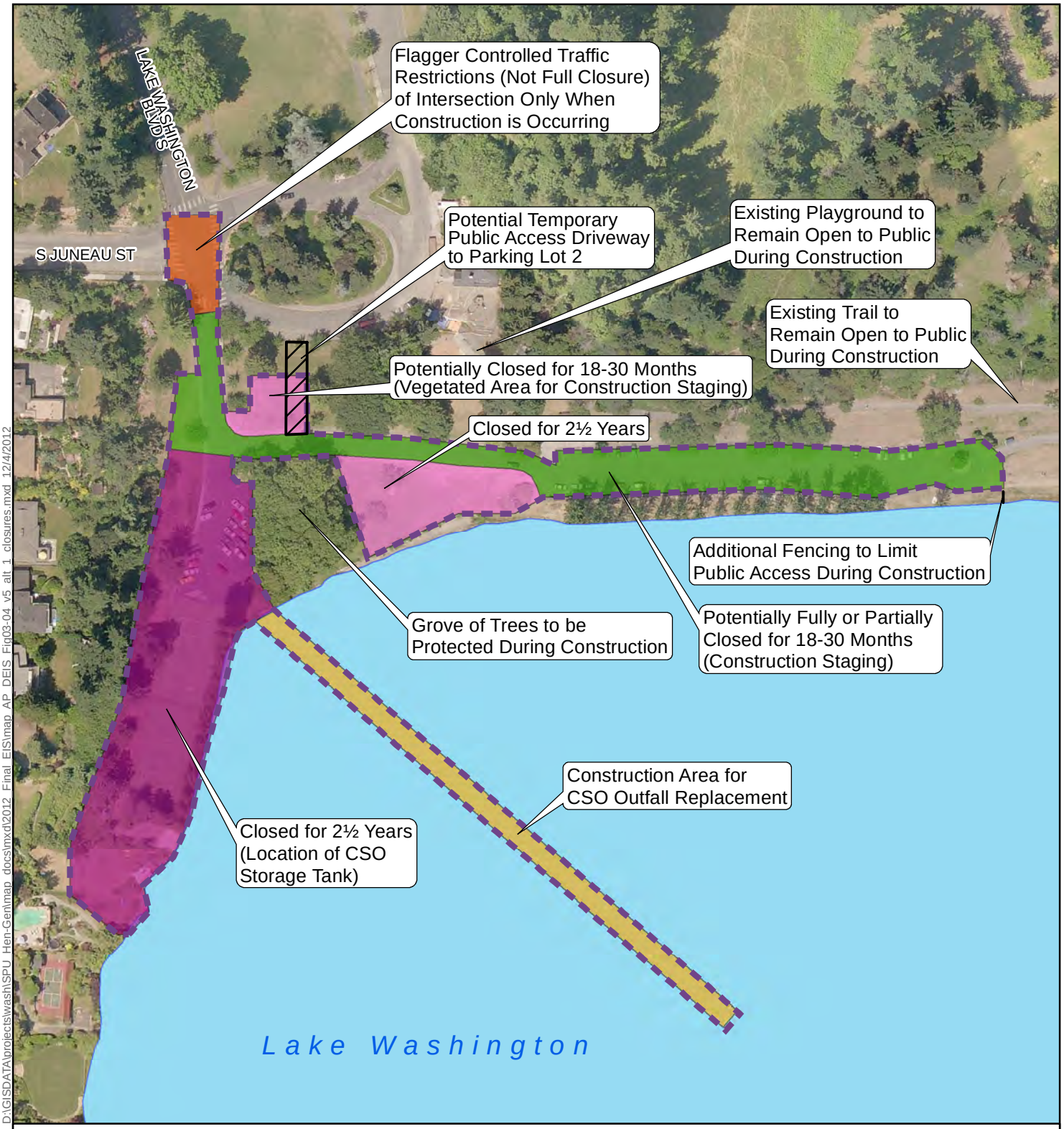
3.3 What public access restrictions would occur during construction?

Portions of Seward Park and the UPARR replacement area would temporarily be closed to the public during construction. The closed areas and durations are somewhat different for the Tennis Courts Alternative and the Parking Lot Alternative, as described below and shown in Figure 3-4 and Figure 3-5.

3.3.1 Areas for Project Components

- **Parking Lot 1 and Tennis Courts (Tennis Courts Alternative):** The new CSO storage tank and facilities vault would be located under Parking Lot 1 and the tennis courts. The public would not have access to these areas for the entire construction period, which is up to approximately two-and-a-half years.

- **Parking Lot 2 (Parking Lot Alternative):** The new CSO storage tank and facilities vault would be located under Parking Lot 2. The public would not have access to this area, as well as the access road to it, for the entire construction period, which is up to approximately two-and-a-half years. Seattle Parks maintenance staff would have access to Parking Lot 2 throughout construction. This would enable park maintenance staff to use the loop road, as well as to access the Seattle Parks pump station.
- **UPARR Replacement Area:** The public would not have access to most of the UPARR replacement area during planting of the upland landscaping enhancements, which would take approximately four to six weeks. Figure 3-9 shows the area that would be fenced during that period. Additionally, contractors may use a small portion of the adjacent parking lot for landscaping materials and equipment staging. Staging would eliminate 6 to 8 spaces in the 33-space parking lot.



D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EIS\map_AP_DEIS_Fig03-04_v5_alt_1_closures.mxd 12/4/2012

Legend

- Potential Limits of Construction
- Fence Outside Limits of Construction
- Potential Temporary Public Access Driveway to Parking Lot 2
- Closed for 2½ Years (Location of CSO Storage Tank)
- Potentially Closed for 18-30 Months (Vegetated Area for Construction Staging)
- Potentially Fully or Partially Closed for 18-30 Months (Construction Staging)
- Intermediate Closures
- Closed During CSO Outfall Replacement

0 60 120 240 Feet

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

TENNIS COURTS ALTERNATIVE
MAIN TEMPORARY CLOSURES IN SEWARD PARK

JANUARY 2013 | **FIGURE 3-4**

This page was left intentionally blank.

D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012 Final EIS\map_AP_DEIS_Fig03-05_v5_alt_2_closures_May2012.mxd 12/4/2012

Legend

- Potential Limits of Construction
- Fence Outside Limits of Construction
- Closed for 2½ Years (Location of CSO Storage Tank)
- Potentially Closed for 18-30 Months (Vegetated Area for Construction Staging)
- Potentially Fully or Partially Closed for 18-30 Months (Construction Staging)
- Intermediate Closures
- Closed During CSO Outfall Replacement

N

0 60 120 240 Feet

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

PARKING LOT ALTERNATIVE
MAIN TEMPORARY CLOSURES IN SEWARD PARK

JANUARY 2013 | **FIGURE 3-5**

This page was left intentionally blank.

3.3.2 Areas for Construction Staging and Contractor Parking

An area would be needed for contractor staging and contractor parking. The contractor staging would likely include space for a contractor trailer, a City inspector trailer, minor stockpiling of construction materials, and street-licensed construction equipment (e.g., trucks, trailer, graders, street sweeper, water truck). A certain amount of area would be needed for the entire construction period of up to approximately two-and-a-half years, while a larger area would be needed only for the first year and a half.

A range of options was considered for contractor staging and contractor parking. The options, including their advantages and disadvantages, are included in Table 3-2 and their locations are shown on Figure 3-6.

The contractor, working with the City, would select the actual staging approach and location based on a number of factors, including the ability to obtain permits. Use of any privately owned sites would require negotiation with the property owners. The analysis in this EIS is based on using the following areas for staging because they have the most impacts to the park and therefore provide a conservative approach to the recreation impact analysis and because they are the most desirable locations from a constructability perspective:

- **Seward Park - Parking Lot 1 and Tennis Courts (Parking Lot Alternative only):** From a constructability perspective, it would be ideal to fully close Parking Lot 1 and the tennis courts to the public for one-and-a-half years. After that time, Parking Lot 1 would reopen to the public either fully or on weekends during the last year of construction. A full reopening may be possible depending on the other staging areas used by the contractor and the contractor's staging and sequencing approach to building the tank facilities.
- **Seward Park - Parking Lot 2 (Tennis Courts Alternative only):** From a constructability perspective, it would be ideal to fully close Parking Lot 2 (and the access road to it) to the public for approximately one-and-a-half years. After that time, Parking Lot 2 would reopen to the public either fully or on weekends during the last year of construction. A full reopening would be possible depending on the other staging areas used by the contractor and the contractor's staging and sequencing approach to building the tank facilities. A full reopening is the assumption used in the EIS analysis.

  Another variation on using Parking Lot 2 would be to designate a portion of the parking lot for construction staging and contractor parking and leave the remaining portion as public parking. This variation would require traffic control that defines these two areas and could include barricades, cones, signing, temporary striping, and flaggers.

  Seattle Parks maintenance staff would have access to Parking Lot 2 throughout construction to access the loop road and the Seattle Parks pump station.
- **Seward Park – Two nearby Vegetated Areas:** From a constructability perspective, it would be ideal to close these areas to the public for one-and-a-half years. After that time, the areas could potentially reopen depending on the other staging areas used by the contractor and the contractor's staging and sequencing approach to building the tank facilities.

Table 3-2. Contractor Staging and Contractor Parking Options - Advantages and Disadvantages

Option	Advantages	Disadvantages
Seward Park - Parking Lot 1 and Tennis Courts (only for the Parking Lot Alternative) • Adjacent to construction site. • Approximately 0.7 acre.	• Does not require shuttling equipment, materials, and workers to construction site. • Does not impact vegetated park areas. • Less truck trips through neighborhood (compared to offsite locations).	• Impacts park users (reduces parking, reduces event staging, limits access to certain park areas). • Impacts neighborhood by shifting vehicles to on-street parking.
Seward Park - Parking Lot 2 (only for the Tennis Courts Alternative) • Adjacent to construction site. • Approximately 1.0 acre.	• Does not require shuttling equipment, materials, and workers to construction site. • Does not impact vegetated park areas. • Less truck trips through neighborhood (compared to offsite locations).	• Impacts park users (reduces parking, reduces event staging, limits access to certain park areas). • Impacts neighborhood by shifting vehicles to on-street parking.
Seward Park - Parking Lot 3 • Close to construction site. • Approximately 0.5 acre.	• Does not impact vegetated park areas. • Less truck trips through neighborhood (compared to offsite locations).	• Impacts park users (reduces parking, reduces event staging, limits access to certain park areas). • Impacts neighborhood by shifting vehicles to on-street parking. • Requires shuttling equipment, materials, and workers (short distance) to construction site.
Seward Park - Upper Parking Lots • Close to construction site. • Approximately 0.1 to 0.7 acre.	• Does not impact vegetated park areas. • Less truck trips through neighborhood (compared to offsite locations).	• Impacts park users (reduces parking, reduces event staging, limits access to certain park areas). • Impacts neighborhood by shifting vehicles to on-street parking on weekends and during special events. • Requires shuttling equipment, materials, and workers (short distance) to construction site. • Access is up a steep hill.
Seward Park - Two Nearby Vegetated Areas • Adjacent to construction site. • Approximately 0.1 to 0.4 acre.	• Does not require shuttling equipment, materials, and workers to construction site. • Less truck trips through neighborhood (compared to offsite locations). • Does not impacts neighborhood by shifting vehicles to on-street parking.	• Impacts park users (reduces event staging, limits access to certain park areas). • Impacts vegetated park areas.
Seward Park – North Meadow • Close to construction site. • Approximately 1.0 acre.	• Less truck trips through neighborhood (compared to offsite locations). • Does not impact neighborhood by shifting vehicles to on-street parking.	• Impacts park users (reduces event staging, limits access to certain park areas). • Impacts vegetated park areas. • Requires shuttling equipment, materials, and workers (short distance) to construction site.
Offsite Location #1 - SE Corner of Genesee Park • 1.50 miles from Seward Park. • Approximately 1 acre.	• Does not impact neighborhood by shifting vehicles to on-street parking. • Not a highly developed area of Genesee Park. • Not a highly used location of Genesee Park. • Restoration could be as simple as hydro seeding.	• Distance from construction site requires more precise planning/scheduling. • Requires shuttling equipment, materials, and workers to construction site. • Impacts park users (limits access to certain park areas). • Impacts vegetated park areas. • More truck trips through neighborhood (compared to Seward Park locations). • Noise could be a concern for residents adjacent to the staging site.
Offsite Location #2 – Vacant lot on MLK Jr. Way South and South Juneau Street • 1.65 miles from Seward Park. • Approximately ¼ acre.	• Does not impact vegetated park areas. • Less impacts to park users (compared to park locations). • Does not impact neighborhood by shifting vehicles to on-street parking. • Appears not to have a critical use. • Partially fenced for equipment security.	• Distance from construction site requires more precise planning/scheduling. • Requires shuttling equipment, materials, and workers to construction site. • More truck trips through neighborhood (compared to Seward Park locations). • Size may preclude some staging activities. • Access is not ideal since MLK Jr. Way South is a divided roadway.

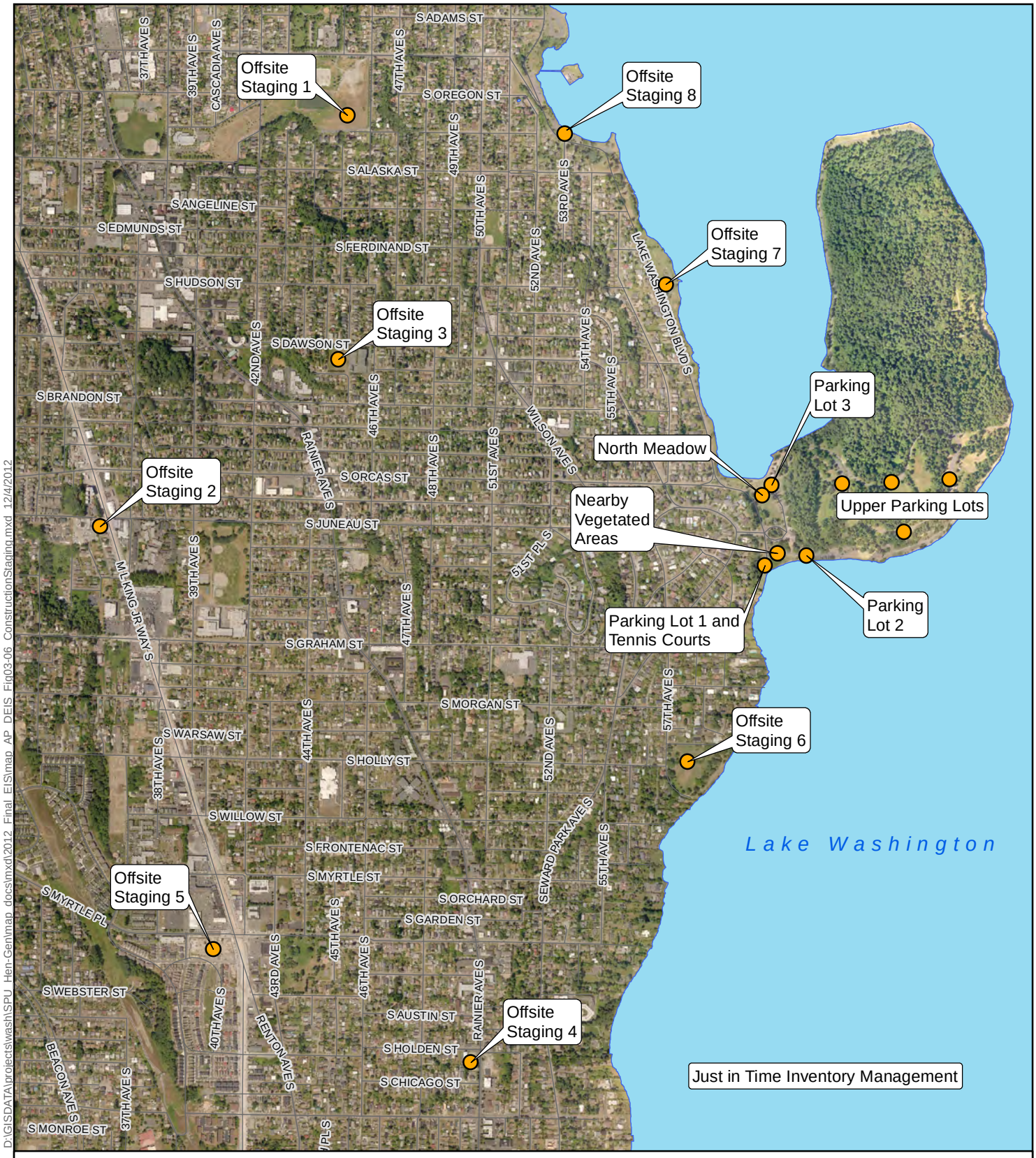
Option	Advantages	Disadvantages
Offsite Location #3 – Unimproved Sports Field at South Dawson Street and 45th Avenue South • 1.17 miles from Seward Park. • Approximately 1.4 acres.	• Does not impact vegetated park areas. • Less impacts to park users (compared to park locations). • Does not impact neighborhood by shifting vehicles to on-street parking. • Appears not to have a critical use. • Easy access to Rainier Avenue South and Seward Park Avenue South. • Restoration could be hydro seeding. • Partially fenced for equipment security.	• Distance from construction site requires more precise planning/scheduling. • Requires shuttling equipment, materials, and workers to construction site. • More truck trips through neighborhood (compared to Seward Park locations). • Adjacent to Whitworth Elementary School. • Security would be necessary to separate staging area from school kids. • Noise could be a concern for residents adjacent to the staging site.
Offsite Location #4 – Vacant Lot on Rainier Avenue South and South Holden Street • 1.5 miles from Seward Park. • Approximately ½ acre.	• Does not impact vegetated park areas. • Less impacts to park users (compared to park locations). • Does not impact neighborhood by shifting vehicles to on-street parking. • Appears not to have a critical use. • Easy access to Rainier Avenue South. • Noise not an issue since adjacent to a busy street. • Partially fenced for equipment security.	• Distance from construction site requires more precise planning/scheduling. • Requires shuttling equipment, materials, and workers to construction site. • More truck trips through neighborhood (compared to Seward Park locations). • Site would need good security (highly visible site). • Metro bus stop in front of site.
Offsite Location #5 – Abandoned Construction Site at MLK Jr. Way South and South Othello Street • 1.75 miles from Seward Park. • Approximately 2.8 acres.	• Does not impact vegetated park areas. • Less impacts to park users (compared to park locations). • Does not impact neighborhood by shifting vehicles to on-street parking. • Appears not to have a current critical use. • Easy access to South Othello Street and MLK Jr. Way South. • Noise not an issue since adjacent to a busy street. • Securely fenced for equipment security.	• Distance from construction site requires more precise planning/scheduling. • Requires shuttling equipment, materials, and workers to construction site. • More truck trips through neighborhood (compared to Seward Park locations). • Site would need good security (highly visible site). • Site construction could resume prior to CSO tank construction.
Offsite Location #6 – Martha Washington Park along South Warsaw Street • 0.6 miles from Seward Park. • Approximately ½ acre.	• Does not impact neighborhood by shifting vehicles to on-street parking. • Currently planned for staging for the Basin 45 CSO Reduction Project. • Central location to provide staging for both (Basin 44 & 45) project sites.	• Distance from construction site requires more precise planning/scheduling. • Requires shuttling equipment, materials, and workers to construction site. • Impacts park users (limits access to certain park areas). • Impacts vegetated park areas. • More truck trips through neighborhood (compared to Seward Park locations).
Offsite Location #7 - Parking Lot on Lake Washington Boulevard South near South Ferdinand Street • 0.6 miles from Seward Park. • Approximately 0.5 acre.	• Does not impact vegetated park areas. • Less impacts to Seward Park users (compared to Seward Park locations).	• Distance from construction site requires more precise planning/scheduling. • Requires shuttling equipment, materials, and workers to construction site. • Impacts park users (reduces parking, limits access to certain park areas). Impacts neighborhood by shifting vehicles to on-street parking. • More truck trips through neighborhood (compared to Seward Park locations).
Offsite Location #8 - Parking Lot at Lake Washington Boulevard South and 53rd Avenue South • 1.0 miles from Seward Park. • Approximately 0.5 acre.	• Does not impact vegetated park areas. • Less impacts to Seward Park users (compared to Seward Park locations).	• Distance from construction site requires more precise planning/scheduling. • Requires shuttling equipment, materials, and workers to construction site. • Impacts park users (reduces parking, limits access to certain park areas). • Impacts neighborhood by shifting vehicles to on-street parking. • More truck trips through neighborhood (compared to Seward Park locations).
Just in Time Inventory Management	• Reduces the size of staging area needed at other identified locations.	• Does not provide a complete solution to staging needs.

3.3.3 Areas Used for Access to the Construction Site

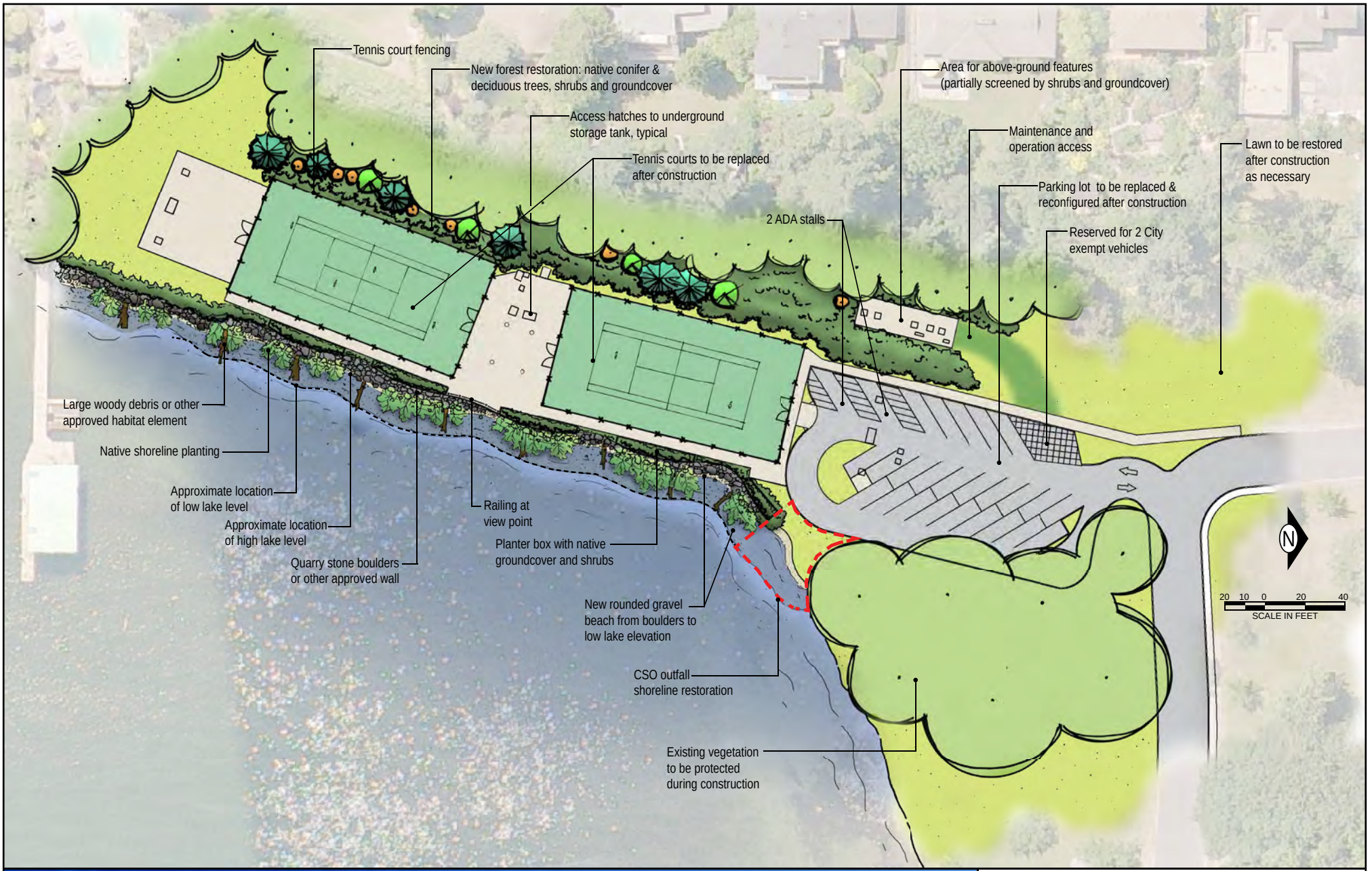
- **Tennis Courts and Parking Lot Alternatives – Seward Park Circular Entrance Road:** The west side of the Seward Park circular entrance road, at the intersection of Lake Washington Boulevard South and South Juneau Street, would have intermittent restricted access. The area would have traffic control that defines pedestrian routes, public access to parking, and construction access to the construction site that could include barricades, cones, signing, temporary striping, and flaggers. The flaggers would direct the public through the construction areas and keep construction vehicles within the construction areas. Construction trucks would enter or exit the park through the construction access. This area also would have traffic control and restrictions during installation of the new water line located under the access road, which is expected to take approximately one week.
- **Tennis Courts Alternative - New Temporary Public Access Driveway to Parking Lot 2:** If Parking Lot 2 were not fully closed to the public, truck access to Parking Lot 1 for construction work would be more complicated. One solution would be to use traffic control to allow trucks to perform a three-point turn between the access road to Parking Lot 2 and Parking Lot 1. Another potential solution would be for construction trucks to access Parking Lot 1 via the existing road into Parking Lot 1 and to construct a new temporary driveway for public vehicles to access Parking Lot 2. This potential public access driveway could be located between the southern end of the Seward Park circular entrance road and the existing access road to Parking Lot 2.

3.4 What would the proposed project area look like after construction?

Upon completion of construction, the areas within the limits of construction would be restored as described below. Figure 3-7, Figure 3-8, and Figure 3-9 provide conceptual drawings and several conceptual depictions of the areas are provided as well at the end of this section.


Offsite Staging 1
Offsite Staging 8
Offsite Staging 7
Offsite Staging 3
Offsite Staging 2
Offsite Staging 6
Offsite Staging 5
Offsite Staging 4
Parking Lot 3
North Meadow
Upper Parking Lots
Nearby Vegetated Areas
Parking Lot 2
Parking Lot 1 and Tennis Courts
Lake Washington
Just in Time Inventory Management
S ADAMS ST
S OREGON ST
S ALASKA ST
S ANGELINE ST
S EDMUNDS ST
S FERDINAND ST
S HUDSON ST
S DAWSON ST
S BRANDON ST
S ORCAS ST
S JUNEAU ST
S GRAHAM ST
S MORGAN ST
S WARSAW ST
S HOLLY ST
S WILLOW ST
S FRONTENAC ST
S MYRTLE ST
S ORCHARD ST
S GARDEN ST
S AUSTIN ST
S HOLDEN ST
S CHICAGO ST
S MONROE ST
S WEBSTER ST
S MYRTLE PL
37TH AVE S
39TH AVE S
CASCADIA AVE S
47TH AVE S
49TH AVE S
50TH AVE S
53RD AVE S
52ND AVE S
LAKE WASHINGTON BLVD S
54TH AVE S
55TH AVE S
42ND AVE S
46TH AVE S
RAINIER AVE S
48TH AVE S
51ST AVE S
WILSON AVE S
51ST PL S
M L KING JR WAY S
44TH AVE S
38TH AVE S
SEWARD PARK AVE S
57TH AVE S
45TH AVE S
43RD AVE S
40TH AVE S
RENTON AVE S
BEACON AVE S
Legend
Potential Staging Location
0 500 1,000 2,000
Feet
N
Seattle Public Utilities
HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT
CONSTRUCTION STAGING OPTIONS
JANUARY 2013
FIGURE 3-6
D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012 Final EIS\map_AP_DEIS_Fig03-06_ConstructionStaging.mxd 12/4/2012

This page was left intentionally blank.



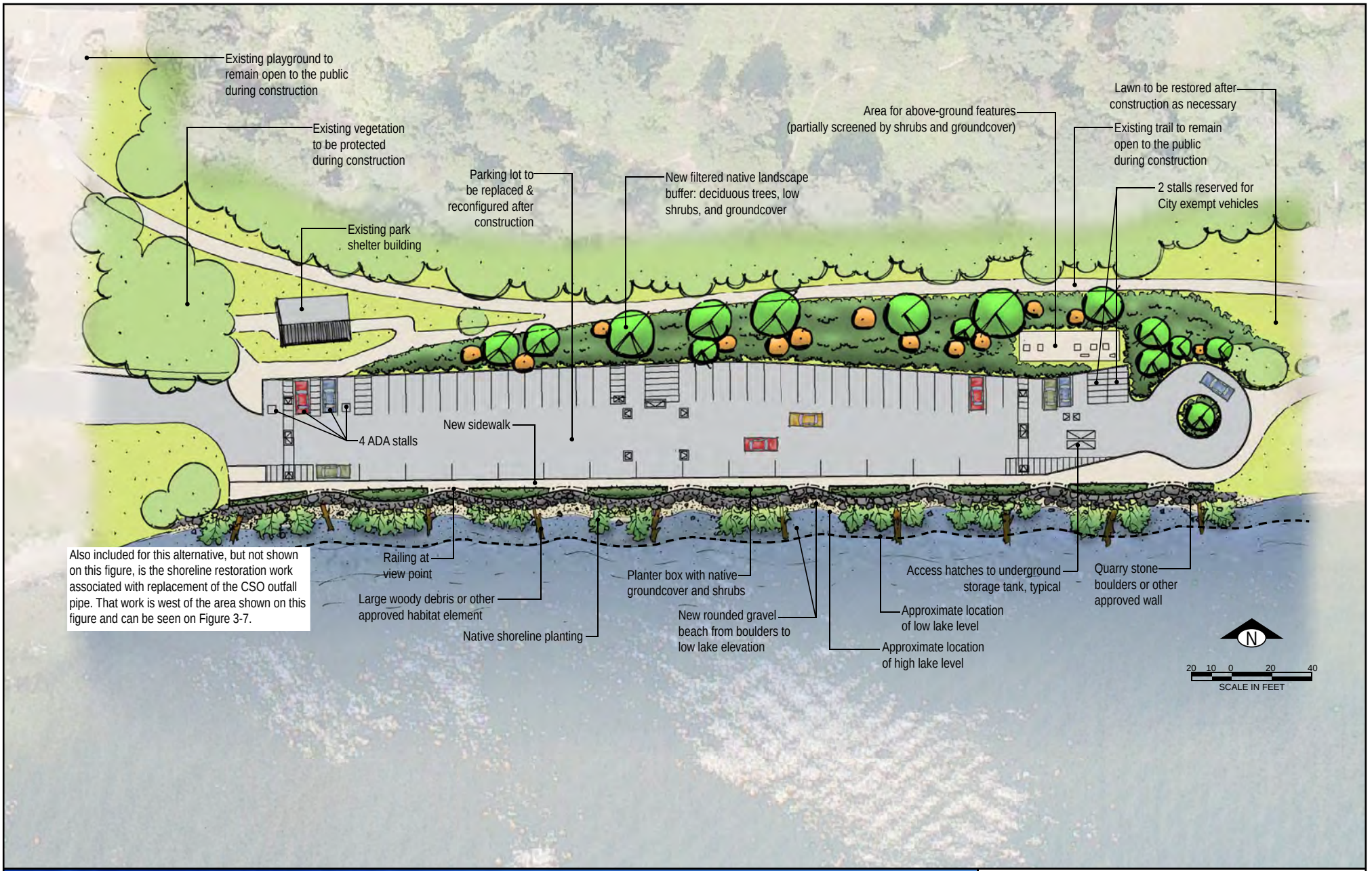
Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

TENNIS COURTS ALTERNATIVE
POST CONSTRUCTION CONCEPTUAL PLAN

JANUARY 2013 | **FIGURE 3-7**

This page was left intentionally blank.



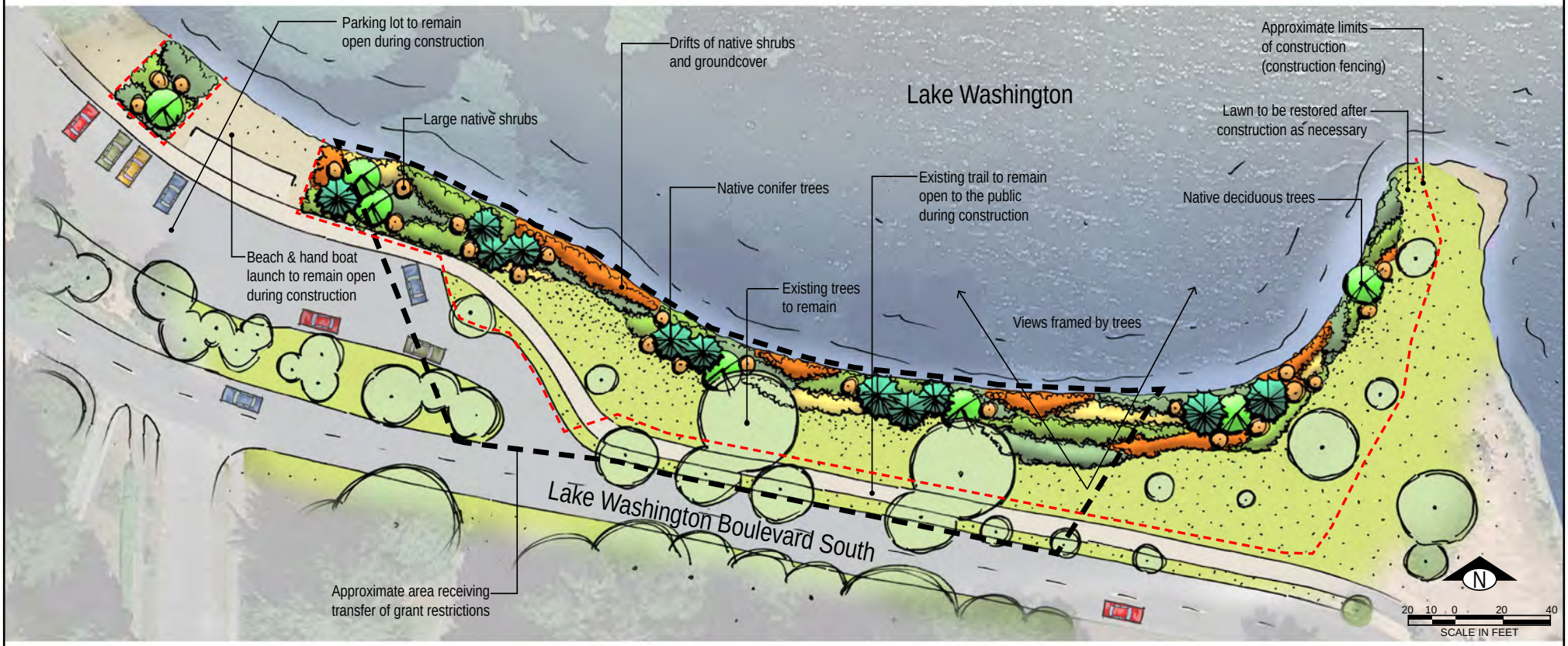
Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

PARKING LOT ALTERNATIVE
POST CONSTRUCTION CONCEPTUAL PLAN

JANUARY 2013 | **FIGURE 3-8**

This page was left intentionally blank.



Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

UPARR REPLACEMENT AREA
UPLAND LANDSCAPING ENHANCEMENT DETAILS

JANUARY 2013 | **FIGURE 3-9**

This page was left intentionally blank.

Tennis Courts Alternative – Conceptual Depiction of CSO Storage Tank Location

Parking Lot Alternative – Conceptual Depiction of CSO Storage Tank Location

Parking Lot 1: Table 3-3 shows the number of current and post-construction parking spaces. The parking lot currently has 28 parking spaces, including one accessible parking space (as defined under the Americans with Disabilities Act).

- **Tennis Courts Alternative:** Parking Lot 1 would be completely rebuilt. The new parking lot would have a different configuration to allow for access to the facilities vault though ground level hatches. The new parking lot would have 28 parking spaces, including two accessible parking spaces and two spaces for exempt City vehicles ("D license plates") used by SPU maintenance, police, and Seattle Parks personnel. This reconfiguration would result in a net loss of two public spaces (loss of three regular spaces and the gain of one accessible parking space).
- **Parking Lot Alternative:** Parking Lot 1, which would be used for staging, would be repaved and restriped. The restriping would include adding one accessible parking space. The reconfigured parking lot would have 27 parking spaces, including two accessible parking spaces. This reconfiguration would result in a net loss of one public space (loss of two regular spaces and the gain of one accessible parking space).

Table 3-3. Parking Lot 1 Current and Post-construction Parking Spaces

Category	Tennis Courts Alternative (Used for CSO Storage Tank)			Parking Lot Alternative (Used for Staging)		
	Current	Post-Construction	Change	Current	Post-Construction	Change
Public - Regular	27	24	-3	27	25	-2
Public – ADA-accessible[1]	1	2	+1	1	2	+1
City Vehicles	0	2	+2	0	0	0
Total	28	28	0	28	27	-1

[1] Per the Americans with Disabilities Act, accessible parking spaces have at least a 60-inch-wide access aisle located adjacent to the designated parking space. The access aisle is just wide enough to permit a person using a wheelchair to enter or exit the car.

Parking Lot 2: Table 3-4 shows the number of current and post-construction parking spaces. The parking lot currently has 62 parking spaces, including four accessible parking spaces.

- **Tennis Courts Alternative:** Parking Lot 2, which would be used for staging, would be repaved and restriped to restore it to existing conditions, with no change to the number of parking spaces.
- **Parking Lot Alternative:** Parking Lot 2 would be completely rebuilt. The new parking lot would have a different configuration to allow for access to the facilities vault though ground level hatches. The new parking lot would have 60 parking spaces, including four accessible parking spaces and two spaces for exempt City vehicles. This reconfiguration would result in a net loss of four public spaces (loss of four regular spaces and no change in the number of accessible parking spaces).

Table 3-4. Parking Lot 2 Current and Post-construction Parking Spaces

Category	Tennis Courts Alternative (Used for Staging)			Parking Lot Alternative (Used for CSO Storage Tank)		
	Current	Post-Construction	Change	Current	Post-Construction	Change
Public - Regular	58	58	0	58	54	-4
Public - Accessible[1]	4	4	0	4	4	0
City Vehicles	0	0	0	0	2	+2
Total	62	62	0	62	60	-2

[1] Per the Americans with Disabilities Act, accessible parking spaces have at least a 60-inch-wide access aisle located adjacent to the designated parking space. The access aisle is just wide enough to permit a person using a wheelchair to enter or exit the car.

Tennis Courts: For both the Tennis Courts Alternative and the Parking Lot Alternative, both tennis courts would be completely rebuilt, unless Seattle Parks personnel decide during the design stage that they would prefer a different use (e.g., basketball courts, picnic area). For the purpose of this EIS, replacement of the tennis courts is assumed.

Upland Landscaping: Areas within the limits of construction that are currently vegetated and would be disturbed during construction would be re-landscaped. This includes areas near the tennis courts, Parking Lot 1, Parking Lot 2, and the land disturbed to replace the CSO outfall. The landscaping plan would adhere to land use codes, would follow the Seward Park Vegetation Management Plan (International Forestry Consultants, Inc., 2005), and would be developed in consultation with Seattle Parks.

Aboveground Features Area: Vegetative screening likely would be added to the area surrounding the new aboveground features to improve aesthetics and discourage vandalism. Conceptual renderings of this area post construction both with and without the vegetative screening are shown below for each alternative. Note that the renderings are conceptual in nature and the exact landscaping plan would be developed, in consultation with Seattle Parks, during final design. The renderings are intended to portray screening using shrubs and groundcover; in the Tennis Courts Alternative, the large tree directly behind the area would be removed due to construction.

UPARR Replacement Area: Figure 3-9 shows a conceptual plan of the upland landscaping enhancements which follows the recommendations included in the Lake Washington Boulevard Vegetation Management Plan (Moller, Fischer, Silverman, & Andrews, 2010).

Tennis Courts Alternative - Conceptual Depiction of Aboveground Features before Screening

Tennis Courts Alternative - Conceptual Depiction of Aboveground Features after Screening

Parking Lot Alternative - Conceptual Depiction of Aboveground Features before Screening

Parking Lot Alternative - Conceptual Depiction of Aboveground Features after Screening

3.5 How would the CSO storage tank work?

Under normal conditions, the sewer pipes in Basin 44 convey combined sewer flows into the adjacent downstream SPU combined sewer system, then into King County's sewer system, and eventually to either King County's West Point or South treatment plants for treatment and discharge into Puget Sound.

During wet weather conditions, combined sewer flows would be directed to the existing CSO storage pipe at CSO Facility 8 until it is full and then to the new CSO storage tank. Once there is capacity in the downstream combined sewer system, the flows would be returned to the main combined sewer system. For the Tennis Courts Alternative, the new CSO storage tank would be emptied by pumping combined sewer flows directly back to the main combined sewer system. For the Parking Lot Alternative, the flows would be pumped to the existing CSO storage pipe and then flow by gravity to the main combined sewer system. If completely full, the new CSO storage tank would take approximately two-and-a-half days to fully drain for the Tennis Courts Alternative and three days to fully drain for the Parking Lot Alternative. After the new CSO storage tank is emptied, the tank would be flushed with potable water to remove settled debris. The flushing water would be conveyed to the main combined sewer system.

If the combined sewer flows exceed the capacity of both the existing and proposed storage, the flows would be discharged into Lake Washington via the Basin 44 CSO outfall pipe. However, this is expected to occur no more than once per year on a long-term average.

3.6 What type of maintenance would be expected?

The CSO storage tank and associated infrastructure would require routine maintenance to operate properly and reach their design life of 100 years. Table 3-5 provides a summary of the routine maintenance activities, their frequency, the type of equipment, the number of staff involved, and the impact to Seward Park. The frequency of the maintenance activities would range from quarterly to approximately once every 25 years. Most maintenance activities would impact park users temporarily, requiring the closure of Parking Lot 1 and the tennis courts (for the Tennis Courts Alternative) or Parking Lot 2 (for the Parking Lot Alternative) for a few hours. Routine maintenance likely would occur during normal weekday business hours, would be posted in advance to notify park users, and would be scheduled to avoid major events. The system would be designed to operate automatically during a CSO event and SPU staff would not be required to visit the facility during or after each CSO event. However, in the first year or so of use, SPU staff may elect to visit the site periodically during or after a CSO event, which would have similar impacts as the quarterly activities in Table 3-5. Emergency maintenance activities likely would require closing Parking Lot 1 and the tennis courts (for the Tennis Courts Alternative) or Parking Lot 2 (for the Parking Lot Alternative) for a few hours depending on the nature of the emergency.

For the shoreline treatment in Seward Park, maintenance of the new vegetation would be required. For CSO outfall replacement components in Seward Park and the upland landscaping enhancements in the UPARR replacement area, no additional maintenance would be required beyond the existing maintenance performed by SPU and Seattle Parks.

Table 3-5. Routine Maintenance Activities for CSO Storage Tank and Associated Infrastructure

Frequency	Typical Activities	Equipment and Staff	Impacted Area
Quarterly	Inspect and maintain water flushing tipping buckets and fill ports.[1]	Service Truck and 2 Staff	Closure of Parking Lot 1 and tennis courts (Tennis Courts Alternative) or Parking Lot 2 (Parking Lot Alternative) for 2 to 4 hours due to open hatches in driving and walking areas.
	Exercise valves, motor-operated gate, and pumps in facilities vault.[1]		
	Inspect debris build-up on walls and weirs and clean as necessary.[1]		
	Inspect and maintain indicator lights, displays, pressure gauges, and monitoring equipment.		
Annually	Inspect mechanical and electrical equipment for wear and corrosion.	Service Truck and 2 Staff	Closure of Parking Lot 1 and tennis courts (Tennis Courts Alternative) or Parking Lot 2 (Parking Lot Alternative) for 2 to 4 hours due to open hatches in driving and walking areas. Activities for the annual maintenance could be performed in conjunction with quarterly inspection activities (requires an additional service truck and 2 staff).
	Inspect and maintain carbon filter bed, HVAC supply/exhaust, and odor control fans.		
	Remove and replace fouled odor control system filters.		
	Remove, clean, and replace basin drain pumps, as needed.[1]		
	Test and certify backflow prevention device.		
Infrequent (every 5 to 25 years)	Replace Carbon Media.	Service Truck, Vactor™ Truck and Four Staff	Closure of Parking Lot 1 and tennis courts (Tennis Courts Alternative) or Parking Lot 2 (Parking Lot Alternative) for 4 to 6 hours due to open hatches in driving and walking areas.
	Remove and replace tank drain pumps (offsite servicing).[1]	Service Truck and 2 Staff	Closure of Parking Lot 1 and tennis courts (Tennis Courts Alternative) or Parking Lot 2 (Parking Lot Alternative) for 2 to 4 hours due to open hatches in driving and walking areas.
	Perform sewer cleaning.	Vactor Truck and 2 Staff	Closure of Parking Lot 1 and tennis courts (Tennis Courts Alternative) or Parking Lot 2 (Parking Lot Alternative) for 2 to 4 hours.
Very Infrequent (every 25+ years)	Replace mechanical equipment (valves, pumps, piping).[1]	Service Truck and 3 Staff	Closure of Parking Lot 1 and tennis courts (Tennis Courts Alternative) or Parking Lot 2 (Parking Lot Alternative) for 6 to 8 hours; however, closure duration would be dependent on the equipment being removed and replaced.
	Remove and replace tipping buckets, as needed.[1]	Crane, Semi-Truck, Service Van, 3 to 10 staff	Closure of both Parking Lot 1 and the tennis courts (for the Tennis Courts Alternative) or Parking Lot 2 (for the Parking Lot Alternative) for 1 to 2 days.
	Inspect structure of storage tank and facilities vault.[1]	2 Service Trucks and 6 to 10 Staff	Closure of both Parking Lot 1 and the tennis courts (for the Tennis Courts Alternative) or Parking Lot 2 (for the Parking Lot Alternative) for 1 to 2 days.

[1]For the Tennis Courts Alternative, this maintenance activity would require driving on the surface of the tennis court(s), although the maintenance truck would be routed to the apron outside of the doubles sideline to the extent feasible.

This page was left intentionally blank.

4 Recreation

4.1 What recreational resources exist in the area?

The primary recreational resources in the project area are Seward Park and Lake Washington Boulevard Park (see Figure 4-1).

4.1.1 Seward Park

Seward Park is approximately 278 acres in size, and includes a variety of opportunities for passive and active recreation. Figure 4-2 shows the project areas for both the Tennis Courts Alternative and the Parking Lot Alternative.

Seward Park South Shoreline

Seward Park was designed by the Olmsted Brothers, which was the premier landscape architecture firm of the era. The Olmsted Brothers developed a citywide parks plan in 1903 that envisioned a series of parks of varying sizes connected by pleasure drives and parkways to form an "emerald necklace" that would wrap around the city limits (Parks 2011d). The Olmsted Brothers subsequently created a preliminary plan for Seward Park in 1912 that included 4.2 miles of drives, 12 miles of walking paths, boating access, basketball and tennis courts, swimming, croquet, playground, dancing pavilions, summer dwellings, and maintenance facilities. The Olmsteds' plan incorporated these activities and their supporting infrastructure into the natural setting of Seward Park, retaining 95 percent of the forest. The intent of the Olmsted plan and that of the Seattle Board of Park Commissioners from that time was to maintain the park in its natural condition. See Appendix C for more information regarding the Olmsted design principles.

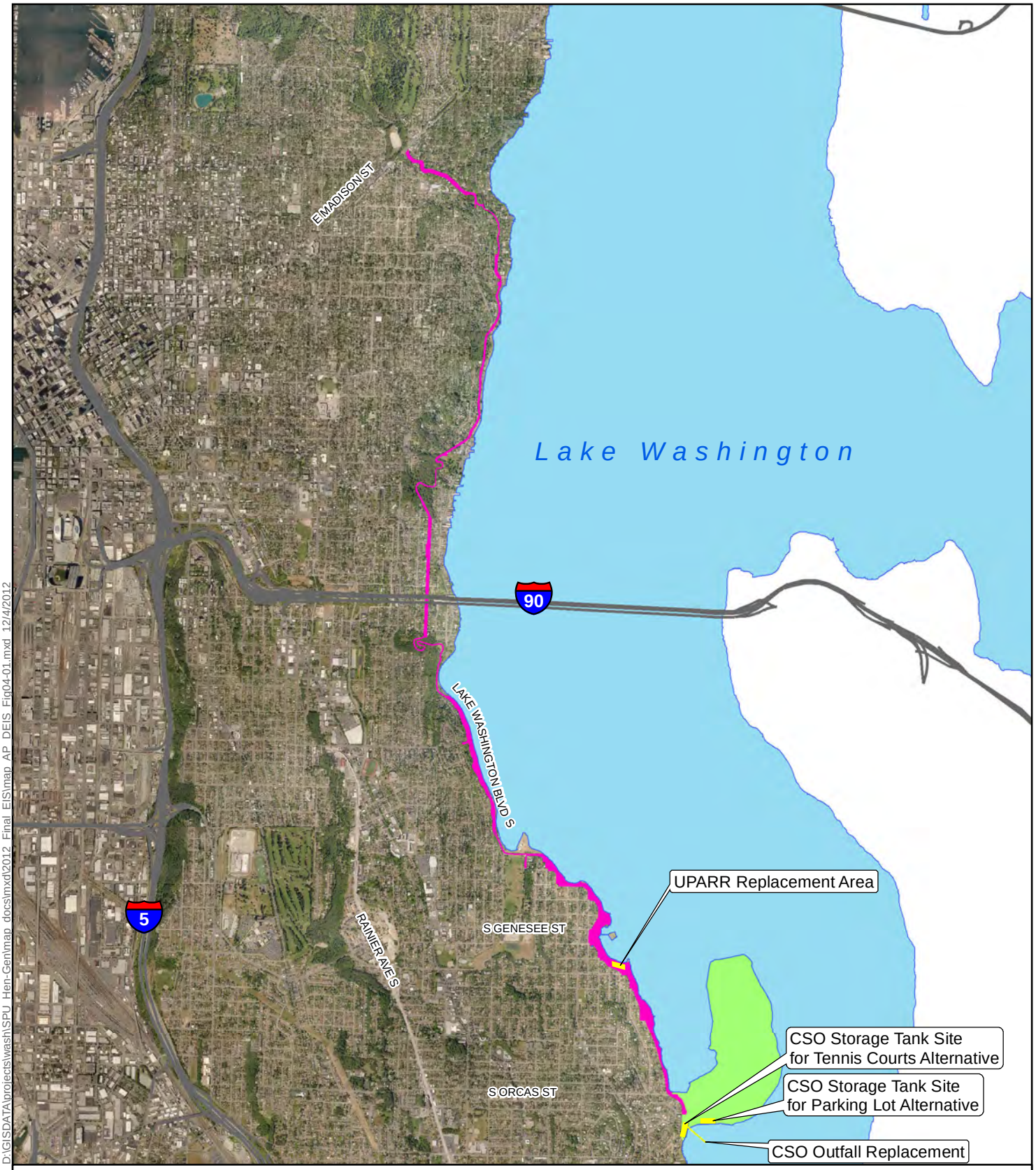
Bird watching, one of the many recreational activities in Seward Park

Recreational Activities and Features

Seward Park offers a variety of recreational activities and features. The Olmsted vision for Seward Park focused on passive means of experiencing the park. Although the plan included active recreational opportunities on the perimeter, the majority of the park was planned to be untouched to allow the park to "unconsciously influence" park users (Beveridge 2000). Many people currently perceive the park as passive and use it for many passive activities. While development since the original plan has increased the opportunities for active recreation, the park remains a destination for quiet strolls and passive gatherings. Current opportunities for passive recreation include the following:

- Experiencing the native vegetation, water, and terrain, including the forest with trees that are over 200 years old, wetlands, rock outcroppings, native plant garden, and the shoreline.
- Observing beautiful views that are often framed by trees and considered one of the best attributes of Seward Park. Many benches along the trails are provided for resting to observe views.
- Walking the several miles of hiking trails through the forest and the 2.4-mile-long multi-use trail along the shoreline.
- Orienteering throughout the park.
- Picnicking in meadows that contain minimal development.
- Sunbathing in open meadows or on the beaches.
- Wildlife viewing along the trails, shoreline, and wooded areas. This includes viewing nests of eagles and other birds.

Seward Park is primarily used by visitors who park and casually recreate (e.g., bird watching, enjoyment of scenic views, picnicking). There are picnic shelters along the Lake Washington shoreline that are frequently used and are in close proximity to Parking Lot 2. Other activities include sunbathing at the cove grass area between Parking Lots 1 and 2 and tennis during the warmer months. In December, the Seattle Christmas Ship arrives at the cove area and anchors offshore. People along the shoreline prepare a bonfire and gather while carols are amplified from the ship.



D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EIS\map_AP_DEIS_Fig04-01.mxd 12/4/2012

Legend

- Lake Washington Blvd Park (to Madison St.)
- Seward Park
- Potential Project Areas

0 2,000 4,000 8,000 Feet

N

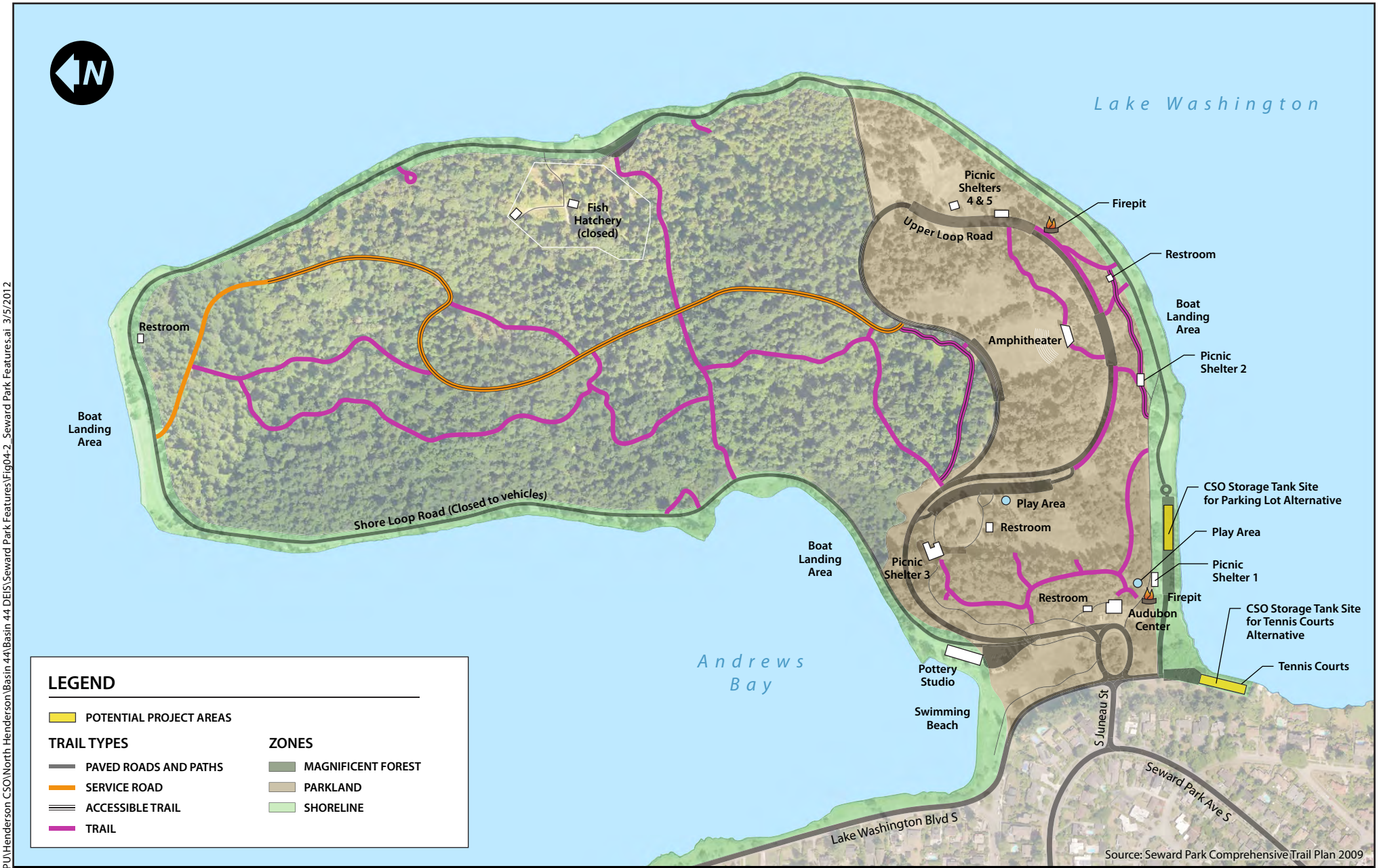
Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

PROPOSED ALTERNATIVES WITHIN SEWARD AND LAKE WASHINGTON BOULEVARD PARKS

JANUARY 2013 | **FIGURE 4-1**

This page was left intentionally blank.



M:\GRAPHICS\Client\SPU\Henderson CSO\North Henderson\Basin 44\Basin 44 DEIS\Seward Park Features\Fig04-2_Seward Park Features.ai 3/5/2012

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

SEWARD PARK FEATURES

JANUARY 2013

FIGURE 4-2

This page was left intentionally blank.

The original Olmsted plan incorporated opportunities for active recreation, but they were not the focus of Seward Park. Rather, they served as a backdrop to the presence of the forest and lake. Current opportunities for active recreation include the following:

- Walking along the shoreline trail and wooded paths
- Using the children's play area
- Playing tennis
- Swimming activities at the beaches, docks, and diving boards
- Using the designated picnic shelters
- Landing/launching boats
- Anchoring boats in Andrews Bay
- Visiting the clay studio
- Using the Seward Park Environmental and Audubon Center
- Attending plays and other performances in the amphitheater
- Fishing along the shoreline and docks
- Conducting sporting activities in open areas including soccer, baseball, kickball, and Frisbee
- Attending activities in the event staging and exposition area

2.4-Mile Shore Loop Road

Audubon Center

As shown in Figure 4-2, Seward Park has many trails and features. Some are paved roads and paths, others are dirt, and others include segments of ADA-accessible trails.

Park Buildings

Seward Park has several buildings used for recreational activities, including a clay studio, an Audubon Center for environmental education, and an amphitheater. In addition, the park has picnic shelters and restrooms (see Figure 4-2).

Access

Seward Park has one vehicle entrance, which is in the southwest part of the park where Lake Washington Boulevard South and South Juneau Street intersect with Seward Park Road. Chapter 8 Transportation describes the major and minor arterial streets in the project vicinity, as

well as current and projected traffic conditions, and addresses potential impacts to park access and traffic circulation near Seward Park and Lake Washington Boulevard Park.

Entrance to Parking Lots 1 and 2

Parking

Seward Park contains seven public parking lots (see Figure 4-3). The parking lot at the southern end of Lake Washington Boulevard South (Parking Lot 1 on Figure 4-3), as well as the adjacent tennis courts, is the location of the underground storage tank for the Tennis Courts Alternative. It has 28 spaces including one accessible parking space. The parking lot along Seward Park Road on the southern side of the park (Parking Lot 2 on Figure 4-3) is the location of the underground storage tank for the Parking Lot Alternative. It has 62 spaces including four accessible parking spaces (Figure 4-3). The other five parking lots are within 600 to 1,800 feet of the alternative sites and provide an additional 261 parking spaces.

Figure 4-4 shows public on-street parking within a half-mile radius of the project area. On-street parking is located along several public roads, including Seward Park Avenue South and Wilson Avenue South. On-street public parking often is used to accommodate special events, programs at the Audubon Center and the clay studio, and on heavy use days to access the lower shoreline areas.

The majority of special events at Seward Park rely on the parking lots, on-street parking, shuttle service to and from the park, or some combination of these options. An example of shuttle service is the "Walk for Rice at Seward Park," where organizers offered a special shuttle service from offsite to Seward Park.

Parking Lot 1

Parking Lot 2

Legend

- Open During Construction
- Closed During Construction

0 200 400 800 Feet

N

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

SEWARD PARK PARKING LOTS

JANUARY 2013 | **FIGURE 4-3**

M:\GRAPHICS\Client\SPU\Henderson CSO\North Henderson\Basin 44\Basin 44 DEIS\Seward Park Parking Lots\Fig04-3_Seward Park Parking Lots.ai 11/18/2011

This page was left intentionally blank.

D:\GISDATA\projects\wash\SPU Hen-Gen\map docs\mxd\2012 Final EIS\map AP DEIS Fig04-04.mxd 12/5/2012

Legend

- Demarcated Parking Area
- Non-Demarcated Wide Parking
- Non-Demarcated Narrow Parking
- Potential Project Areas

0 200 400 800 Feet

N

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

ON-STREET PARKING NEAR SEWARD PARK

JANUARY 2013 | **FIGURE 4-4**

This page was left intentionally blank.

Special Events

Seward Park annually hosts over 70 special events attended by approximately 400,000 visitors (Parks 2010). The dates and times and the approximate attendance levels of typical annual events at Seward Park are contained in Appendix C.

4.1.2 Lake Washington Boulevard Park and UPARR Replacement Area

Lake Washington Boulevard Park is a 117-acre area located along the shoreline of Lake Washington.

Current opportunities for recreation in the park include the following:

- Biking, jogging, walking, and running on the park trail
- Driving the boulevard as a pleasure drive
- Picnicking on lawn areas
- Wildlife viewing, primarily waterfowl and shoreline birds
- Boating and kayaking
- Fishing
- Active waterfront and beach recreation, such as swimming

Many of the Seward Park annual events listed in Appendix C also make use of Lake Washington Boulevard Park. In addition, other events that focus primarily on Lake Washington Boulevard Park include:

- Cherry Blossom Festival, late March to mid-April
- Celebrate Summer Streets with Bicycle Sundays, every Sunday between 10:00 a.m. and 6:00 p.m. from May through September

4.2 How would the proposed project affect recreational resources?

The impacts to recreation due to each alternative are described below. The impacts would be similar for both alternatives; however, park facilities such as the playground are closer to the Parking Lot Alternative than the Tennis Courts Alternative. Therefore, during construction, park users and facilities would be more impacted by construction noise, dust, and traffic under the Parking Lot Alternative (compared to the Tennis Courts Alternative).

4.2.1 Direct Impacts – Tennis Courts Alternative

There are multiple impacts to recreation during and following construction, as discussed below.

4.2.1.1 Seward Park

Park Use

- ***Active and Passive Recreation.*** Recreational activities would be suspended during the 30-month construction period within the fenced construction area to ensure the safety of park users. The park is popular for walking, running, and cycling. Park users would be able to walk the perimeter shoreline trail and the many other forest paths during construction. The pedestrian path north of Parking Lot 2 would remain open to provide a continuous perimeter route around the park. ADA access would be available through the playground.

  Park users would be aware of the construction, in most cases, due to the noise and dust, and notices provided by SPU. Park users may disperse to areas of the park where impacts are not as noticeable, or they may choose to visit another park during construction.

  These impacts to active and passive recreation are not considered significant because the majority of the park (more than 98 percent) would be available for the public to use during construction, and recreation activities could be conducted elsewhere in Seward Park or at other nearby parks. Parking limitations may impact active and passive recreation (as well as the other topics in this Park Use subsection); see the impacts discussion under the Parking subsection.

- ***Tennis Courts.*** Both tennis courts would be demolished and closed during the 30-month construction period because the CSO tank would be located directly underneath the courts. The courts would be reconstructed and located in a slightly more southerly location after the CSO tank and related improvements were completed (see Figure 3-7). Seattle Parks does not track statistics on usage of the tennis courts. However, Seattle Parks staff estimates that approximately 2,200 people play tennis at the Seward Park courts each year. This usage varies depending on the season and day of the week with more usage in the summer and on weekends. The estimated number of 2,200 people includes repeat users and does not represent 2,200 unique individuals. (Seattle Parks 2011a personal communication.) During construction, park users would need to travel to one of eight other public tennis facilities (Section 4.2.3.1 lists locations) to play tennis.

Playing Tennis

The row of poplar trees next to the tennis courts would be removed as part of the construction of the CSO storage tank. Removal of the trees would provide expansive views of south Lake Washington and Mount Rainier. Some tennis players may notice a lack of shade while playing tennis due to the removal of shade-providing trees. Additional vegetation improvements to the slope and area to the south of the tennis courts would help restore the native forest with native trees, shrubs, and groundcover. Replacement of vegetation would be in accordance with the Seward Park Vegetation Management Plan. The improvements to the tennis court area would help reconnect the area south of the tennis courts to the rest of the broader tennis court area.

The land at the CSO storage tank site would have limited options to be developed for future recreational use because of the presence of the tank and because the surface would be paved and contain access hatches. The presence of the project facilities would result in a dedicated use of the sub-surface area and would restrict certain future uses in the surface area. For example, the presence of the CSO storage tank would complicate siting certain structures or developing a treed area in that location. However, if tennis courts were not the preferred recreational use, the surface area could be used for other recreational purposes that require a paved surface, such as basketball courts, a skateboard park, or additional parking for access to recreational opportunities, or it could provide additional open space.

Playground adjacent to Parking Lot 1

- ***Playground.*** Construction activities and associated impacts such as noise, dust, and construction traffic would impact users of the main Seward Park playground, which is located behind Parking Lot 2. Seattle Parks does not track statistics on usage of the playground. However, Seattle Parks staff estimates that approximately 14,600 children and caregivers use the playground each year. This usage varies depending on the season and day of the week with more usage in the summer and on weekends. The estimated number of 14,600 people includes repeat users and does not represent 14,600 unique individuals.

Playground in park interior

(Seattle Parks 2011a personal communication.) Seattle Parks recently rebuilt the playground and provided modern equipment and shoreline views. Because the noise and disruption at the playground would affect small children and infants, it is assumed that two-thirds to three-quarters of the people who typically use the main Seward Park playground may not use the playground or may use another playground during construction, to avoid construction noise and traffic. That would result in approximately 24,300 to 27,400 uses of other playgrounds over the course of up to 30 months of construction. Local residents that now walk to the playground at Seward Park and are disturbed by the construction may drive to an alternative playground. There are nine playgrounds in the project vicinity (within 5 miles); eight in parks along the shoreline and one located to the west at Brighton Playfield Tennis Courts. The nine playgrounds provide a range of play opportunities, some of which are equivalent to the Seward Park playground and others that may not be considered equivalent.

There is a second, much smaller play area within the park interior (see Figure 4-2). However, the second play area does not provide an equivalent recreational experience. It consists of a dirt area and a swing set, with no shoreline views. Families who visit the smaller play area are unlikely to notice construction disturbance due to its distance from the construction area.

- ***Picnic Shelters.*** Construction activities and associated impacts such as noise and dust may impact users of Picnic Shelters 1 and 2. Picnic Shelter 1 next to Parking Lot 2 is reserved for use by a total 1,000 individuals per year. An unknown number of individuals use the shelter on an informal basis. Impacts from construction disturbance would decrease the farther a shelter is from the construction site. Shelter 2 would receive more impacts than Shelters 3, 4, and 5. It is assumed that a small portion of Shelter 1 and 2 visitors would choose to use Shelters 3, 4, or 5, or a different park with shelters, and those shelters may have a slight increase in usage. Shelter 1 is the only ADA accessible shelter. Construction would disturb access to Shelter 1 from Parking Lot 2. ADA users would need to access the shelter through the playground. Most picnic shelter users may choose one of the other three shelters within Seward Park or visit a nearby park to avoid construction impacts.
- ***Audubon Center and Clay Studio.*** Construction activities and associated impacts such as noise and dust, as well as parking lot closures, may impact users of the Audubon Center and the clay studio. In 2011 approximately 11,000 people visited the Audubon Center and another approximately 10,000 people attended school or community programs at the Audubon Center (Audubon Center 2011). These numbers include repeat users and do not represent unique individuals. The clay studio typically has 105 to 125 students per quarter, with winter and spring being the heaviest quarters and summer the least busy (Parks 2012). The Audubon Center has an annual budget of about $415,000. Approximately $33,000 of their revenue is from program tuition, building rentals, and store sales. The remainder of their revenue is obtained from individual and foundation grants and donations (Parks 2012). The clay studio's annual budget is about $250,000-$270,000, half of which comes from classes and artist residencies (Parks 2012).

Scheduled activities at the Audubon Center and clay studio would continue during construction, but the number of visitors and program participants may temporarily decrease. This may cause a temporary decrease in revenue from program tuition and building rentals, and may cause a temporary decrease in individual and foundation grants and donations. Impacts to the Audubon Center and clay studio due to the parking lot closures are discussed under the Parking sub-section. Similar impacts are expected for the Amphitheater.

- ***Water Activities.*** Construction could impact water activities in the area between Parking Lot 1 and Parking Lot 2. Boaters launch hand-powered kayaks, canoes, and stand-up paddleboards from the beach. These individuals would likely have difficulty finding a place close to the beach to park and walk their boats to the water to launch. Some boaters may choose to visit another boat launch area within Seward Park or Lake Washington Boulevard Park.

  During construction of shoreline restoration features and the installation of the new outfall pipe, in-water recreational activities such as kayaking, boating, and swimming would be restricted in those locations. To help ensure the safety of swimmers and boaters, access to the shoreline and the CSO outfall areas would be blocked during construction. A low to moderate number of these recreational users may go elsewhere in Seward Park or to a nearby park for swimming, boating, and kayaking.

- ***UPARR Grant Program.*** A small portion of Seward Park would lose protection under the NPS UPARR grant program. Two areas are proposed for conversion (see Figure 3-1). One area, which is 750 square feet, would be the location of aboveground features related to operation of the CSO tank. The second area, which is 3,100 square feet, would be between the rebuilt tennis courts where access hatches would be located.

  This loss of federal protection in Seward Park is not considered significant for several reasons. The affected area represents a small portion of Seward Park. The federal protections would be transferred to another area (the UPARR replacement area in Lake Washington Boulevard Park). The UPARR replacement area meets or exceeds the recreational opportunities in the Seward Park areas. The UPARR replacement area is much larger than the area losing the protections (approximately 21,300 square feet versus 3,850 square feet). The UPARR replacement area is used more for recreation whereas the aboveground features area in Seward Park is a passive area not commonly used for recreation.

- **Recreation and CSO Facility Operations.** Routine maintenance activities (consisting of inspecting the storage tank, facilities vault equipment, hatches, and tipping buckets) are anticipated to impact recreational use at the park because the parking lot and tennis courts would need to be closed. These activities would take place approximately quarterly within the facilities vault (located under Parking Lot 1) and around the tennis court area. It is anticipated one SPU vehicle and two to four SPU maintenance crew staff would be at the site for two to four hours to perform necessary work. These regularly scheduled

activities would be posted to inform park users in advance and could be scheduled during times of less-frequent park use.

Very infrequent CSO storage tank maintenance, including structural inspection of the tank and major equipment replacement, is anticipated to be performed only once every 25+ years. During this infrequent maintenance, access to Parking Lot 1 would be restricted for a period of approximately one to two days. This maintenance would be scheduled during times of less-frequent park use.

As described previously, some maintenance activities would require driving on the surface of the tennis court(s), although the maintenance truck would be routed to the apron outside of the doubles sideline to the extent feasible. The courts would be designed to accommodate maintenance vehicles driving on them. Should damage to the tennis courts occur due this maintenance, the damage would be repaired.

- **Odors and Noise during Operations.** Odors from the CSO system should not be noticeable provided the odor control facilities were functioning properly. The system would be underground so noise would not be noticeable.

Access

Additional traffic would be anticipated at the park entrance during the hours of construction, and would consist of construction trucks and contractor employee vehicles (see Chapter 8 Transportation). Increased traffic during construction would result in a loss of "unconscious influence" of the park experience that the Olmsted Brothers originally envisioned. It would also affect the principle of "orchestration of movement and use" because the circulation of vehicles and pedestrians would be affected. (See Appendix C for description of Olmsted design principles.) After project construction is complete, access would be restored to previous conditions. These impacts would be temporary and not significant.

Parking

Construction would require closing Parking Lot 1 for building the CSO facilities and possibly Parking Lot 2 for staging. This would result in the temporary closure of 28 parking spaces (27 regular and 1 ADA) in Parking Lot 1 for 30 months and 62 parking spaces (58 regular and four ADA) in Parking Lot 2 for 18 to 30 months (see Figure 3-4). Seward Park contains seven public parking lots (see Figure 4-3) providing a total of 351 parking spaces. Closure of the 90 parking spaces in Parking Lots 1 and 2 would result in a 25 percent reduction of available parking in Seward Park. Use of parking spaces typically turns over throughout the day; therefore, the closure of the 90 parking spaces impacts more than 90 vehicles.

While Parking Lots 1 and 2 are temporarily closed, park visitors, whether for regular park use or for special events, could use other parking lots within Seward Park or on-street parking on nearby residential streets. Temporary ADA parking spaces would be provided (likely in Parking Lot 3) to replace those unavailable during construction. Within a half-mile area of Seward Park, there are approximately 1,400 on-street parking spaces (see Figure 4-4). This on-street parking is currently used during peak park usage and special events at Seward Park.

Existing use of the Seward Park parking lots and nearby on-street parking was assessed by conducting a traffic study (HDR 2012a). The study was performed on a sunny Friday, Saturday, and Sunday during August to reflect peak summer time use; more spaces likely would be available at other times. The results are summarized in Table 4-1. Parking Lots 1 and 2 were not at full capacity on the Friday or Sunday, but were full in mid afternoon to early evening on the Saturday. Parking Lots 3 through 7 were not at full capacity on the Friday, but were full in mid afternoon to early evening on the Saturday and Sunday.

Table 4-1. Peak Season Parking Lot Usage – Existing Conditions

Day of Week	Parking Lots 1 and 2 at Full Capacity	Parking Lots 3 through 7 at Full Capacity	Combined Parking Lots 1 through 7 at Full Capacity
Friday	No	No	No
Saturday	Mid afternoon to early evening	Mid afternoon	Mid afternoon
Sunday	No	Mid afternoon to early evening	Mid afternoon to early evening

Existing use of on-street parking was assessed by conducting a field study; see Appendix C for more details (HDR 2012a). The study was conducted on a warm Saturday in August to reflect peak summer time use; more spaces likely would be available at other times. Approximately 80 percent (or 1,160 spaces) of the on-street parking spaces within the half-mile area around Seward Park were available. Generally, streets closer to Seward Park had less available spaces and streets farther away had more available spaces. Only one street (South Juneau Street directly west of the park entrance) had no available spaces. The lower parking lots in Seward Park (Parking Lots 1 through 3) were nearly full during the study. The availability of on-street parking spaces would be higher on weekdays and during the winter, compared to the study.

The anticipated impact of temporarily closing Parking Lots 1 and 2 was analyzed using information from the parking lot traffic study, the on-street parking field study, and special event attendance information. The analysis examined impacts to the remaining parking lots and to on-street parking and considered both regular and special event days. The analysis focused on peak season; the impacts are expected to be less at other times. More information about the analysis is provided in Appendix C.

The impact on Seward Park parking lots and on-street parking on peak season days without special events is shown in Table 4-2. On a typical peak season Friday during construction, the remaining parking lots (Parking Lots 3 through 7) would have the capacity to absorb the vehicles that would have used Parking Lots 1 and 2. However, as described further below, Parking Lots 3 through 7 are not comparable substitutes for Parking Lots 1 and 2 and therefore some vehicles may use nearby on-street parking.

Table 4-2. Peak Season Parking Lot Usage – During Construction

Day of Week	Parking Lots 3 through 7	
	At Full Capacity	Additional Vehicles Parking in Neighborhood[1]
Friday	No	0
Saturday	afternoon to early evening	100
Sunday	afternoon to mid evening	95

[1] Not all of these vehicles would be present at the same time. The number of vehicles is more than the 90 parking spaces due to turnover in vehicles.

On a typical peak season Saturday during construction, approximately 100 vehicles would not be able to find parking in the remaining parking lots (Parking Lots 3 through 7), during the peak afternoon to early evening time frame. These vehicles could use the surrounding neighborhood for parking. The Seward Park parking lots were full for approximately four hours on Saturday during the parking lot traffic study. Assuming each of the 100 vehicles stays for two hours, there would be approximately an additional 50 vehicles in the neighborhood during the peak afternoon to early evening time frame. On-street parking would be able to accommodate these vehicles, since the field study documented 1,160 available spaces during a peak season day.

On a typical peak season Sunday during construction, there would be approximately 95 vehicles that would not be able to find parking in the remaining parking lots (Parking Lots 3 through 7), during the peak afternoon to mid evening time frame. These vehicles could use the surrounding neighborhood for parking. The Seward Park parking lots were full for approximately seven hours on Sunday during the parking lot traffic study. Assuming each of the 95 vehicles stay for two hours, there would be approximately an additional 25 vehicles in the neighborhood during the peak afternoon to mid evening time frame. On-street parking would be able to accommodate these vehicles, since the field study documented 1,160 available spaces during a peak season day.

For special events, the impact depends on the size of the event, as shown below. The impact analysis compares the estimated number of event vehicles using the Seward Park parking lots and on-street parking under existing conditions and during construction.

- **Small Events:** Small events are those with attendance of less than 300 people. Seward Park typically hosts approximately 15 small events per year. Examples range from the Family Bike Event (attendance 100) to the Epiphany School Stewardship Project (attendance 275). The impact analysis is based on an event with attendance of 299 people. Assuming two people per car, there would be 150 event vehicles.

  Existing Conditions: There are 351 total parking spaces in Seward Park. Approximately half of the spaces (175) were assumed to be available for event vehicles and half for regular park users. Because there are an estimated 150 event vehicles and 175 parking spaces for event vehicles in Seward Park, the parking lots in Seward Park would likely accommodate all of the event vehicles. However, as described further below, Parking

Lots 3 through 7 are not comparable substitutes for Parking Lots 1 and 2 and therefore some event vehicles may use nearby on-street parking.

During Construction: There would be 261 parking spaces in Seward Park after closure of Parking Lots 1 and 2. Approximately half of the spaces (130) were assumed to be available for event vehicles and half for regular park users. Because there would be 150 event vehicles and only 130 parking spaces for event vehicles in Seward Park, approximately 20 event vehicles would be displaced from the parking lots into on-street parking. The 20 vehicles represent 1 percent of the total on-street parking spaces (1,400 spaces) and a 2 percent reduction in the on-street parking spaces typically available during special events of this size (1,160 spaces on a peak season day; some of the 1,400 spaces would be used by regular park users). The impact of the parking lot closures during small events would inconvenience visitors, however the visitors would likely find nearby on-street parking.

- **Medium Events:** Medium events are those with attendance of 300 to 999 people. Seward Park typically hosts approximately 15 medium events per year. Examples range from the Beat the Eggs Run and Walk (attendance 300) to the Hike and Seek Walk (attendance 500). The impact analysis is based on an event with attendance of 999 people. Assuming two people per car, there would be 500 event vehicles.

  Existing Conditions: There are 351 total parking spaces in Seward Park. Approximately half of the spaces (175) were assumed to be available for event vehicles and half for regular park users. Because there are an estimated 500 event vehicles and only 175 parking spaces for event vehicles in Seward Park, 175 event vehicles likely would use the Seward Park parking lots and 325 event vehicles likely would use on-street parking within a half-mile of the park.

  During Construction: There would be 261 parking spaces in Seward Park after closure of Parking Lots 1 and 2. Approximately half of the spaces (130) were assumed to be available for event vehicles and half for regular park users. Because there would be 500 event vehicles and only 130 parking spaces for event vehicles in Seward Park, approximately 370 event vehicles would likely use on-street parking. This is an increase in 45 event vehicles (370 during construction versus 325 existing conditions) using on-street parking. The 45 additional event vehicles would be combined with 45 regular park use vehicles, for a total of 90 vehicles displaced from the Seward Park parking lots, which represents an 11 percent reduction in the on-street parking spaces typically available during special events of this size. Approximately 800 parking spaces would still be available within a half-mile of the park. Those 90 vehicles represent 18 percent of the 500 event vehicles. The impact of the parking lot closures during medium events would inconvenience visitors, however, the visitors would likely find on-street parking within a half-mile from the park.

- **Large Events:** Large events are those with attendance of more than 1,000 people. Seward Park typically hosts approximately 15 large events per year. Examples range from the New Balance Girls on the Run 5k (attendance 1,000) to Seafair (attendance 300,000). The impact analysis is based on an event with attendance of 30,000 people, which is the attendance for the second largest Seward Park event (Pista Sa Nayon). Seafair was not used because its attendance is an order of magnitude higher than the next largest event. Assuming two people per car, there would be 15,000 event vehicles.

  Existing Conditions: There are 351 total parking spaces in Seward Park. Approximately half of the spaces (175) were assumed to be available for event vehicles and half for regular park users. Because there are an estimated 15,000 event vehicles and only 175 parking spaces for event vehicles in Seward Park, 175 event vehicles likely would use the Seward Park parking lots and 14,825 event attendees likely would use on-street parking or shuttles. Furthermore, because there are only 1,160 on-street parking spaces within a half-mile of the park available on a peak season day, 13,665 event attendees likely would use on-street parking from a broader area or shuttles.

  During Construction: There would be 261 parking spaces in Seward Park after closure of Parking Lots 1 and 2. Approximately half of the spaces (130) were assumed to be available for event vehicles and half for regular park users. Because there would be 15,000 event vehicles and only 130 parking spaces for event vehicles in Seward Park, approximately 14,870 event attendees would likely use on-street parking or shuttles. This is an increase in 45 event attendees (14,870 during construction versus 14,825 existing conditions) using on-street parking or shuttles. The 45 additional event vehicles would be combined with 45 regular park use vehicles, for a total of 90 vehicles displaced from the Seward Park parking lots, which represent less than 1 percent of the event vehicles typically needing on-street parking spaces beyond a half-mile from the park or shuttles (13,665 vehicles). Those 90 vehicles represent less than 1 percent of the 15,000 event vehicles. The impact of the parking lot closures during large events would inconvenience visitors and visitors would have to park farther than a half-mile from the park or use shuttles.

While some park users may use the other Seward Park parking lots or on-street parking, those are not comparable substitutes for Parking Lots 1 and 2 and thus some park users may be dissuaded from coming to Seward Park. This impact has the potential to affect all park users, but has more impact on the Audubon Center and the clay studio, which depend on parking for attendance to their programs.

Some park users may not find the alternative parking options convenient or workable because of the added distance, the steep hill, and lack of lighting (for Parking Lots 4, 5, 6 and 7), or carrying heavy loads (even with an unloading zone). One of the other five Seward Park parking lots (Parking Lot 3) is relatively close, approximately 500 feet, to Parking Lots 1 and 2. The other Seward Park parking lots (Parking Lots 4, 5, 6, and 7) are 600 to 1,800 feet away and are up a steep hill that is unlit at night. Every Thursday evening in the summer, the upper loop road

is closed from 4 p.m. to 9 p.m. for bike racing, which limits access to Parking Lots 4, 5, 6, and 7 and, therefore, the impact is increased at those times.

Additionally, more demand for on-street parking because of closure of Parking Lots 1 and 2 would inconvenience and impact residents in the adjacent neighborhood. They would have less on-street parking for themselves and their visitors, there would likely be more litter left on the streets, and there would be additional traffic and people in the area.

Following construction, Parking Lot 1 would be replaced and Parking Lot 2 would be resurfaced, restriped, and reopened to the public. See Table 4-3 for a list of the changes in the number of parking spaces available after construction. The impacts following construction would not be significant because most parking would be restored and the loss of two public parking spaces represents a very small portion (less than 1 percent) of parking capacity in Seward Park.

Table 4-3. Existing and Post Construction Parking Spaces – Tennis Courts Alternative

Type of Parking Space	Number of Existing Parking Spaces	Number of Parking Spaces after Construction	Change in Number of Parking Spaces
Parking Lot 1 (Tennis Courts)			
Regular Vehicle	27	24	- 3
ADA-accessible	1	2	+ 1
Maintenance Vehicle Restricted	0	2	+ 2
Parking Lot 2 (Larger Lot)			
Regular Vehicle	58	58	No change
ADA-accessible	4	4	No change
Maintenance Vehicle Restricted	0	0	No change

Special Events

Special events that use Seward Park as their starting or ending point or staging area would be affected by the reduction in available parking and event staging areas, congestion, and increased traffic, noise, and dust during construction. As discussed above, the closure of Parking Lots 1 and 2 would impact parking for special events and have a lesser impact on event staging, since most of the events use the lots for parking and not for staging. Some of these special events may choose to relocate temporarily to another location in Seward Park, to another park, or to a non-park location. Some special events may not come back to Seward Park after construction. Finding a suitable alternative location, either park or non-park based, may be difficult in some cases. During Seafair, the largest special event in Seward Park, construction in the park would be suspended.

No impacts to special events would be anticipated following construction. Although periodic maintenance would occur, it would normally be scheduled to avoid special events at the park.

Public Safety

No significant impacts to public safety are anticipated during construction. Construction and staging areas would be fenced and signs would be posted keeping the public out of the construction zone. Flaggers and cones would control the traffic where trucks would enter and leave the construction site to protect the safety of pedestrians and private vehicles.

No impacts to public safety are anticipated following construction. Ongoing activities would include maintenance, periodic inspections, and infrequent tank cleaning. The area around where routine maintenance occurs would be cordoned to restrict public access. Access to the CSO tank and facility would be limited to SPU crews and the access hatches would be locked.

4.2.1.2 UPARR Replacement Area

The transfer of UPARR grant protections, as well as the construction of the upland landscaping enhancements, would occur in advance of or simultaneously with the proposed construction at Seward Park. Impacts to the UPARR replacement area during construction would include: temporary closure of a small area of Lake Washington Boulevard Park; temporary construction-related impacts to park users (e.g., noise, dust, traffic); and routine maintenance activities. These impacts are described below and are not expected to be significant.

UPARR Replacement Area

During installation of the upland landscaping enhancements, the entrance to the parking lot on Lake Washington Boulevard at 53rd Avenue South may be blocked periodically for deliveries and hauling of materials. The park trail would remain open during construction as well as part of the parking lot. A small portion of the parking lot (a few of the 33 spaces) may be used for staging of the landscaping materials and equipment during the 4 to 6 week landscaping construction period.

Park users would likely notice noise and increased traffic from construction vehicles during construction at the UPARR replacement area. Construction of the proposed upland landscaping enhancements at the UPARR replacement area would last approximately 4 to 6 weeks and include direct impacts on cyclists and pedestrians using the Lake Washington Boulevard Park. Cyclists may choose to use the path rather than the road to avoid construction traffic, resulting in a more crowded path. The park trail would remain open during construction as well as part of the parking lot. The area within the construction limits at the UPARR replacement area would be closed. However, there are no defined uses of this space and areas to the immediate south could accommodate similar uses that would be lost during construction. Construction would result in a disruption of the aesthetic quality and use of the boulevard as a "pleasure drive," according to Olmsted principles (see Appendix C). These impacts would be

temporary and are not significant. Access to the shoreline would be blocked within the construction limits. Construction at the UPARR replacement area would be scheduled to avoid major special events in the area.

Water and beach access would continue to be available to the north at the hand boat launch ramp and to the south, including the kayak launch area adjacent to the parking lot. Impacts on park users and those wishing to access the water would be minimal as there are other places along the lake where visitors can access the water.

No impacts are anticipated after construction is completed. The shoreline would contain drifts of shrubs and groundcovers, similar to the original vision of the Olmsted Brothers. Routine maintenance of the lawn, drifts of shrubs, and groundcover (see Figure 3-9) would be periodic (similar to existing maintenance efforts) and would not interfere with use of the park.

4.2.2 Direct Impacts – Parking Lot Alternative

There are multiple impacts to recreation during and following construction, as discussed below.

4.2.2.1 Seward Park

Park Use

The construction impacts on Seward Park use under the Parking Lot Alternative would be similar to those described for the Tennis Courts Alternative. Figure 3-5 shows what areas would be closed under the Parking Lot Alternative. The Parking Lot Alternative would have direct impacts on the tennis courts, sewage pump station, vegetation, and nearby park amenities. Additional or different impacts from those described for the Tennis Courts Alternative are described for the Parking Lot Alternative below.

- ***Tennis Courts.*** The tennis courts likely would be closed for 18 to 30 months due to the adjacent parking lot (Parking Lot 1) likely being used for construction staging and contractor parking. Similar to the Tennis Courts Alternative, during construction, park users would need to travel to one of eight other public tennis facilities in order to play tennis.
- ***Playground and Picnic Shelter 1.*** The playground and Picnic Shelter 1 (Figure 4-2) are located immediately adjacent to the CSO excavation area for the Parking Lot Alternative. Construction activities and related impacts, such as noise and dust, would be greater under the Parking Lot Alternative because the activities would be located closer to park facilities than under the Tennis Courts Alternative. It is assumed that at least two-thirds to three-quarters of the usual playground users may not use the playground or may use another park during construction.
- ***Audubon Center and Clay Studio.*** Because the Audubon Center and clay studio would be much closer to the Parking Lot Alternative than to the Tennis Courts Alternative, construction of the Parking Lot Alternative likely would have more impact on users of the Audubon Center and the clay studio. Scheduled activities at the Audubon Center and clay studio would continue during construction, but the number of visitors and program

participants likely would temporarily decrease. This would cause a temporary decrease in revenue from program tuition and building rentals, and might cause a temporary decrease in individual and foundation grants and donations. Impacts to the Audubon Center and clay studio due to the parking lot closures are discussed under the Parking sub-section.

- **Parking Lot 2 Area.** The row of poplar trees near the parking lot would be removed as part of construction of the CSO storage tank, which would provide expansive views of south Lake Washington and Mount Rainier. A mix of native deciduous trees, low shrubs, and groundcover would be planted between Parking Lot 2 and the existing path to the north (Figure 3-8). Shrubs and groundcover also would be provided to screen the aboveground features. The addition of low shrubs and groundcover between the parking lot and pedestrian path would be in keeping with the natural character of the park and Olmsted design principles.

  The area at the CSO site under the parking lot would have limited options for future recreational development because it would be paved and contain access hatches. However, the presence of the storage tank would not prevent rebuilding of the existing parking lot so that the public would continue to have adequate access to the park.

- ***UPARR* Grant *Program.*** The area proposed for UPARR conversion within Seward Park under the Parking Lot Alternative is 15 feet wide by 50 feet long (750 square feet), and is not a commonly used area for passive or active recreation (see Figure 3-2). It is at the northeast corner of Parking Lot 2 on the grassy area between the parking lot and the trail. The area would be visible from all directions, including Parking Lot 2 and the trail, and at a distance from east and west, whereas the conversion area proposed for the Tennis Courts Alternative is more likely to be seen only from Parking Lot 1. The conversion area would be the location of approximately a half dozen aboveground features related to operation of the CSO tank, and would not be available for future development as a recreational area. The conversion area would likely be screened with vegetation to obscure views partially. The loss of federal protection in this small area in Seward Park is not considered significant for the same reasons discussed under the Tennis Courts Alternative.

Access

The impacts on access to Seward Park under the Parking Lot Alternative would be the same as those described for the Tennis Courts Alternative.

Parking

The construction impacts on parking at Seward Park under the Parking Lot Alternative would be similar to those described for the Tennis Courts Alternative. Ninety spaces would be closed during construction due to closure of Parking Lots 1 and 2 (see Figure 3-5). Similar to the Tennis Courts Alternative, the reduction in parking during construction would likely be significant during periods of peak park usage, for example on summer weekends, when park users may not be able to find parking that is close enough for their needs. Park usage may decrease and users may opt to use other parks.

Following construction, Parking Lot 2 would be replaced and Parking Lot 1 would be resurfaced, restriped, and reopened to the public. See Table 4-4 for a list of the changes to the number of parking spaces available after construction. The impacts following construction would not be significant because most parking would be restored and the combined loss of five public parking spaces represents a very small portion (less than 1 percent) of parking capacity in Seward Park.

Table 4-4. Existing and Post Construction Parking Spaces – Parking Lot Alternative

Type of Parking Space	Number of Existing Parking Spaces	Number of Parking Spaces after Construction	Change in Number of Parking Spaces
Parking Lot 1 (Tennis Courts)			
Regular Vehicle	27	25	- 2
ADA-accessible	1	2	+ 1
Maintenance Vehicle Restricted	0	0	No change
Parking Lot 2 (Larger Lot)			
Regular Vehicle	58	54	- 4
ADA-accessible	4	4	No change
Maintenance Vehicle Restricted	0	2	+ 2

Special Events

The impacts on special events at Seward Park under the Parking Lot Alternative would be the same as those described for the Tennis Courts Alternative, which may be significant during construction if other, nearby locations are not available on the schedule required for the event.

Public Safety

Like the Tennis Courts Alternative, no significant impacts to public safety are anticipated during or following construction of the Parking Lot Alternative. Proposed vegetation between the parking lot and pedestrian pathway would include low shrubs and groundcover to allow for continued surveillance by police, emergency personnel, and Seattle Park staff.

4.2.2.2 UPARR Replacement Area

The impacts under the Parking Lot Alternative would be the same as those described for the Tennis Courts Alternative and would not be significant.

4.2.3 Indirect Impacts – Tennis Courts Alternative

4.2.3.1 Seward Park

Indirect impacts due to construction of the CSO storage facility in Seward Park consist of impacts to other parks and tennis courts.

Park Use. Because available parking spaces would be decreased by 25 percent at Seward Park and the use of some park areas would be reduced or impaired during construction, park users who are interested in similar shoreline-based recreational experiences may decide to move to other locations in Seward Park, Lake Washington Boulevard Park, or other parks along

the western shore of the lake. This increased use at other parks or within Seward Park may or may not be noticeable and could adversely affect the recreational experience of some park users. Additionally, there may be more competition for parking spaces.

Tennis Courts. The use of the tennis courts at Seward Park would be discontinued during the construction period. Recreational users accustomed to playing at these tennis courts would be required to seek alternative locations. The eight public tennis facilities (32 courts) in the vicinity that could receive increased use are listed below:

- Brighton Playfield (6000 39th Avenue South): 2 concrete courts.
- Rainier Playfield (3700 South Alaska Street): 4 lighted laykold courts. (Laykold is a special surface used for tennis courts.)
- Dearborn Park (2919 South Brandon Street): 2 asphalt courts.
- Rainier Beach Playfield (8802 Rainier Avenue South): 4 lighted laykold courts.
- Amy Yee Tennis Center (2000 Martin Luther King Jr. Way South): 10 indoor and 4 outdoor courts.
- Sam Smith Park (1400 Martin Luther King Jr. Way South): 2 outdoor courts.
- Leschi Park and Tennis Courts (201 Lakeside Avenue): 2 outdoor courts.
- Madison Park and Tennis Courts (East Madison and East Howe Streets): 2 outdoor courts.

As noted in Section 4.2.1.1, approximately 2,200 people play tennis at the Seward Park courts each year (Seattle Parks 2011a personal communication). The estimated number of 2,200 people includes repeat users and does not represent 2,200 unique individuals. Some portion of these 2,200 players may elect to play at one or more of the eight other nearby tennis facilities during construction. For this analysis, SPU assumed that one-tenth to one-third of the 2,200 players might go to one of the 32 other courts. That would be from approximately 220 to 730 players using another court over the course of a year. Based on the total number of courts, if the players distributed equally to each of the remaining courts, each remaining court would see up to 23 additional players per year during construction.

4.2.3.2 UPARR Replacement Area

The impacts of construction would have no indirect impacts to the UPARR Replacement Area. The improvements to the grant replacement area would be limited to a specific area and would allow for the continued use of the park trail and nearly all of the adjacent parking lot. Therefore, the construction would not displace park users and cause indirect impacts. Following construction, no indirect impacts are anticipated.

4.2.4 Indirect Impacts – Parking Lot Alternative

4.2.4.1 Seward Park

The indirect impacts related to Seward Park associated with the Parking Lot Alternative would be very similar to those for the Tennis Courts Alternative. Because the excavation area for the Parking Lot Alternative would be under Parking Lot 2, which is very close to Picnic Shelter 1, more users may choose to visit another shelter within Seward Park or a nearby park than under the Tennis Courts Alternative. In addition, the Audubon Center and playground is closer to the construction site for the Parking Lot Alternative, and visitors may notice more construction disturbance than under the Tennis Courts Alternative.

4.2.4.2 UPARR Replacement Area

The indirect impacts related to Lake Washington Boulevard Park and the UPARR replacement area associated with the Parking Lot Alternative would be the same as those for the Tennis Courts Alternative.

4.2.5 Direct and Indirect Impacts – No Action Alternative

Under the No Action Alternative, the CSO storage tank would not be built and the shoreline treatment and transfer of grant restrictions would not be implemented. However, the existing CSO outfall is expected to be replaced between 2015 and 2020 as part of the SPU Outfall Rehabilitation Program. The direct and indirect impacts of the CSO outfall replacement would be addressed by a separate SEPA environmental review process that would be conducted prior to the CSO outfall replacement.

4.3 What measures would reduce or eliminate potential impacts on recreation resources?

For both the Tennis Courts Alternative and the Parking Lot Alternative, SPU would take measures to help reduce or eliminate potential impacts to recreation during and after construction. The measures would include, but are not limited to, those listed below:

Park Use and Access

- Consider a range of construction staging methods and sites, including offsite locations, to minimize impacts on park users.
- Return recreational uses disrupted during construction to pre-construction conditions or better.
- Schedule construction to avoid or minimize overlap with the construction of other projects in the vicinity to the extent feasible.
- Provide advance public notice, signage, and website information regarding restrictions to shoreline areas, parking lots, tennis courts, and options for other nearby recreation areas and parking areas.
- Perform routine maintenance activities during periods of low park use.

- Restore the shoreline using native Northwest plants, guidance from the Seward Park Vegetation Management Plan, and review and approval from Seattle Parks.
- Restore the landscaping around the aboveground features with native plants and a planting plan that incorporates Olmsted design principles.
- Improve ADA access to picnic shelters such as 3, 4, and 5.

Parking

- Provide advance public notice, signage, and website information regarding alternative parking locations.
- Continue communications and outreach efforts, including briefings to community and stakeholder groups and SPU tables at events in Seward Park and other community events.
- Place signage at the entrance of Seward Park showing locations of alternative parking locations within the park and alternative playground areas.
- Provide drop off zone and short-term parking to unload passengers, strollers, kayaks, etc., near the entrance to Seward Park.
- Provide temporary ADA parking spaces to replace those unavailable during construction.
- Restore as many parking spaces as possible.
- Restore use of parking lot as soon as feasible.

Special Events

- Coordinate construction hours with the scheduling of special events at Seward Park.
- Suspend construction in the park during Seafair.
- Work with Seattle Parks and event coordinators to find new staging locations (e.g., the Seward Park meadow or Genesee Park) for use during special events.
- Avoid scheduling routine maintenance during special events.
- Provide advance public notice, signage, and website information regarding construction dates.

Public Safety

- Install fencing around the construction site and clearly mark construction areas.
- Use flaggers when trucks and heavy equipment enter or exit the park.
- Monitor construction to confirm that the contractor complies with public safety plans.
- Provide advance public notice, signage, and website information regarding construction dates.

4.4 Would the proposed project have any significant unavoidable adverse impacts on recreation?

Construction of the proposed project would have the following short-term, unavoidable impacts on recreation:

- **Temporary Closure of Tennis Courts:** For the Tennis Courts Alternative, the tennis courts would be closed for up to approximately 30 months for construction of the CSO storage tank under that location. For the Parking Lot Alternative, the tennis courts would be closed for 18 to 30 months if selected as a location for construction staging. The closure of the tennis courts would require people to travel to other tennis courts in the area and increase the competition for court time.
- **Temporary Closure of Parking Lot 1:** For the Tennis Courts Alternative, Parking Lot 1 would be closed for up to approximately 30 months for construction of the CSO storage tank under that location. For the Parking Lot Alternative, Parking Lot 1 would be closed for 18 to 30 months if selected as a location for construction staging. The closure of Parking Lot 1 would reduce available parking, increase traffic congestion, reduce staging areas for special events, and make recreational facilities less accessible within Seward Park, particularly on weekends and in the summer. Some park users may choose to use on-street parking outside of the park, reducing the availability of on-street parking for other uses, or use other parks, increasing the level of activity at those locations.
- **Temporary Closure of Parking Lot 2:** For the Parking Lot Alternative, Parking Lot 2 would be closed for up to approximately 30 months for construction of the CSO storage tank under that location. For the Tennis Courts Alternative, Parking Lot 2 would be closed for 18 to 30 months if selected as a location for construction staging. The closure of Parking Lot 2 would reduce available parking, increase traffic congestion, reduce staging areas for special events, and make recreational facilities less accessible within Seward Park, particularly on weekends and in the summer. Some park users may choose to use on-street parking outside of the park, reducing the availability of on-street parking for other uses, or use other parks, increasing the level of activity at those locations.

This page was left intentionally blank.

5 Cultural Resources

5.1 What are cultural resources?

The term "cultural resources" encompasses archaeological sites, Native American and other traditional cultural resources, historic buildings and structures, planned landscapes, historic districts, and other valued cultural resources. "Historic property" is a technical term from the National Historic Preservation Act (NHPA) (16 U.S.C. 470w, Section 301) that denotes properties that have recognized public significance and are listed or eligible for listing in the National Register of Historic Places (NRHP). For this project, historic properties also include those listed in the Washington Heritage Register (WHR), and properties designated as local landmarks or historic districts by the City of Seattle's Historic Preservation Program. A property that is listed in the NRHP is also listed in the WHR. Historic properties include districts, sites, buildings, structures, objects, and landscapes significant in American history, prehistory, architecture, archaeology, engineering, and culture.

5.2 What regulations protect cultural resources?

The NHPA is the primary mandate governing projects under federal jurisdiction that might affect historic properties. Section 101 of the NHPA created the role of the State Historic Preservation Officer (SHPO) and specified that each state have a SHPO. In Washington State, the director of the Department of Archaeology and Historic Preservation (DAHP) is the SHPO; she and her staff fulfill the SHPO responsibilities. Section 106 of the NHPA requires federal agencies to consider the effects on historic properties from actions on federal property or that they fund or approve. The regulations implementing Section 106 are codified at 36 Code of Federal Regulations (CFR) 800. Paragraph 36 CFR 800.5(a)(1) defines an adverse effect to a historic property as one that may alter, directly or indirectly, any of the characteristics of a historic property that qualify it for inclusion in the NRHP in a manner that would diminish the property's integrity. Section 106 of the NHPA is applicable because the NPS has a federal approval responsibility related to their UPARR grants at Seward Park.

SEPA also requires project effects on cultural resources be considered in weighing the overall effect of the project on the environment, as stipulated in WAC 197-11-960 and SMC 25.05.960. SEPA requires the consideration of any significant environmental impacts to cultural and historic resources, requires that effects on cultural and historic resources be taken into account in the threshold determination process (WAC 197-11-330, SMC 25.05.330), and considered in the EIS (WAC 197-11-440, SMC 25.05.440), and stipulates that historic and cultural preservation is an element of the environment (WAC 197-11-444, SMC 25.05.444). Native American burials are protected under RCW 27.44, and effects to archaeological sites are regulated by RCW 27.53.

Consultation with interested and affected parties is required as part of the NEPA (NHPA Section 106) and SEPA processes. Section 106 defines consulting parties as the SHPO, Native American tribes, representatives of local governments, applicants for federal assistance, and individuals and organizations with a demonstrated interest in a project or concern with the proposed project's effects on historic properties. Because consultation is ongoing, all determinations of eligibility and findings of effect for historic properties presented in this chapter are pending concurrence by the SHPO.

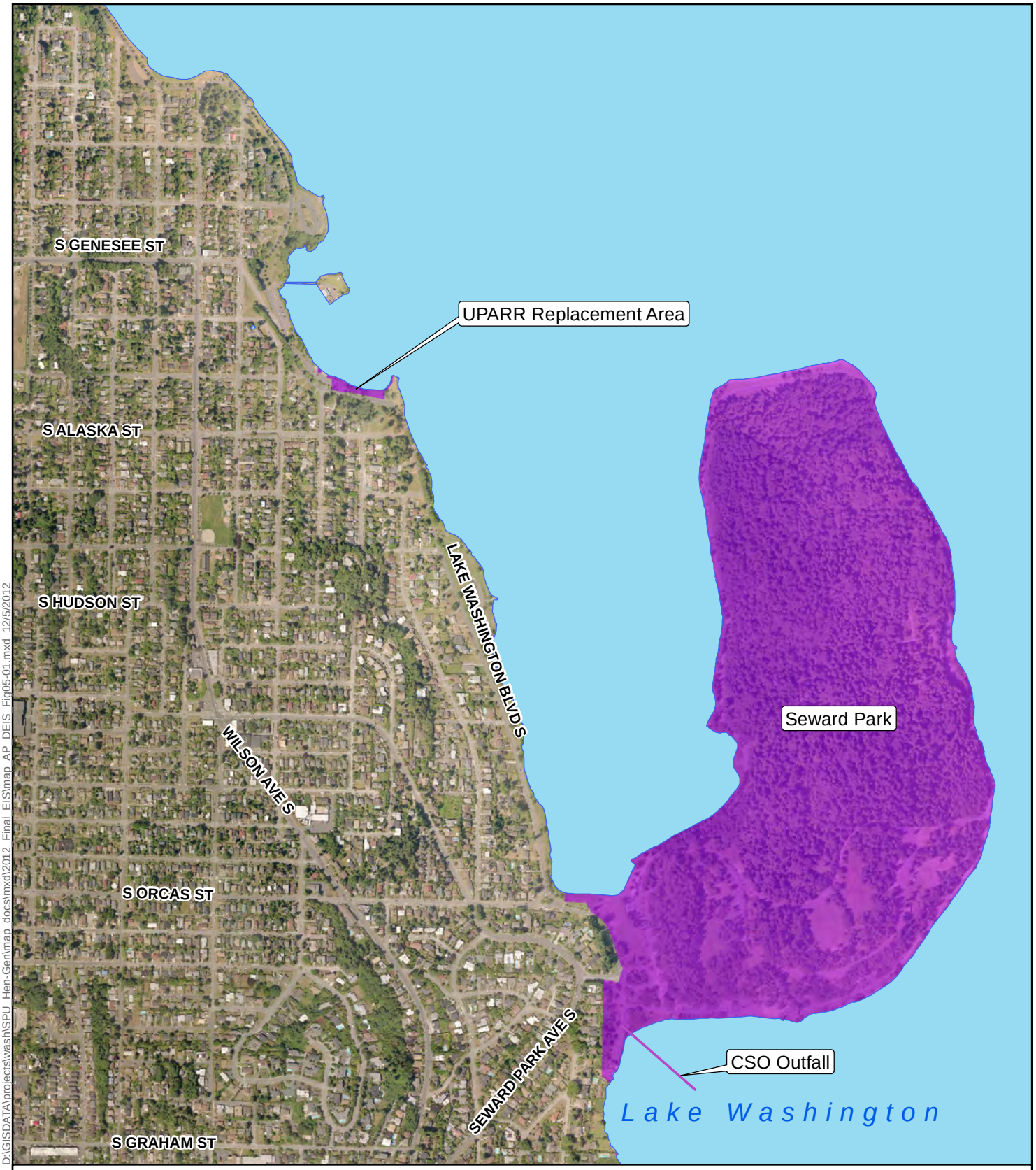
5.3 What is the Cultural Resources Study Area?

As part of the SEPA environmental review required for the entire proposed project, the area assessed for cultural impacts includes all of Seward Park, the CSO outfall, and the UPARR replacement area as shown on Figure 5-1. The study area is surrounded by residential neighborhoods to the west and Lake Washington to the east, and is completely on land owned by Seattle Parks. The study area is located in Sections 14, 23, and 24 of Township 24 North, Range 4 East.

As part of Section 106 of the NHPA, the lead federal agency, in consultation with the SHPO, must determine the Area of Potential Effects (APE). The APE is defined under Section 106 as the area within which a project has the potential to affect historic properties, should such properties exist (36 CFR 800.16(d)). For the UPARR grant relocation portion of the proposed project (i.e., the portion of the project that requires a NEPA environmental review), NPS determined the APE is noncontiguous and encompasses two areas totaling approximately 3,850 square feet of property within Seward Park where the UPARR protection would be removed (see Figure 3-1), and the UPARR replacement area of approximately 21,300 square feet along Lake Washington Boulevard (see Figure 3-3). NPS also would consider indirect effects from their undertaking on the rest of Seward Park. The SHPO concurred with NPS's definition of the APE on June 13, 2012. (See Appendix D for the correspondence from NPS and DAHP regarding the APE.)

5.4 What methods were used to identify cultural resources in the project area and assess potential impacts to them?

The project area was assessed for historic properties (HRA 2012). In determining the potential for historic built environment resources, research was limited to the study area. For archaeological resources, a half-mile radius surrounding the study area was searched. Washington's Information System for Architectural and Archaeological Records Data (WISAARD), DAHP online database was searched for Historic Property Inventory (HPI) forms, archaeological sites, cultural resource survey reports, cemetery records, and the locations of NRHP and WHR properties within the study area. Three previous cultural resource surveys that have been conducted within a half-mile of the study area were reviewed; no significant cultural resources were identified in any of these surveys. The City of Seattle Landmarks Register and the searchable Department of Neighborhoods database were also checked for information on previously identified properties. Historical nineteenth-century maps from the United States



D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EIS\map_AP_DEIS_Fig05-01.mxd 12/5/2012

Legend

Study Area for Cultural Resources

0 500 1,000 2,000 Feet

N

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

STUDY AREA FOR CULTURAL RESOURCES

JANUARY 2013 | **FIGURE 5-1**

This page was left intentionally blank.

Surveyor General Land Office and Sanborn Fire Insurance Maps were reviewed to identify historic-period sites, features, or structures that may still exist in the study area. [More details on cultural resources investigations for the proposed project are provided in the *Cultural Resources Inventory for the Henderson Basin 44 CSO Reduction Project - City of Seattle, King County, Washington,* September 2012, prepared by Historical Research Associates (HRA)]

Research was also conducted to develop a general historical context relative to the project location, as well as Seward Park–specific research to detail the architectural history of the park. Aerial photographs, construction plans, and as-built drawings for Seward Park features were reviewed and research was conducted at the Seattle Municipal Archives and Seattle Public Library, and in online news and periodical archives and websites.

HRA developed probabilities for archaeological resources in the study area prior to fieldwork, based on review of the DAHP statewide predictive model layer; environmental, geological, ethnographic, and archival data; and on previous cultural resources reports near the proposed project. Given that background research showed that the native topography was of glacial origin, and may well have been seasonally inundated, the likelihood for prehistoric archaeological sites is somewhat lower than that predicted by the DAHP model.

The probability is moderate that prehistoric and ethno-historic items may be below the surface along the water's edge. The probability is moderate that the flat area near the road may contain roadside historic trash, and the sloped area may contain household debris such as dishes, bottles, marbles, glass, cans, toys, and construction materials. These probabilities were used to aid in developing the archaeological field strategy.

5.4.1 Field Methods

5.4.1.1 Archaeological Inventory

HRA conducted archaeological inventories of the areas of proposed ground disturbance in Seward Park in April and July 2011. Archaeological survey of the UPARR replacement area was conducted in September 2011. The inventories consisted of pedestrian survey of all exposed ground and the excavation of 25 shovel test probes within the areas proposed for ground disturbance (19 in Seward Park and the remaining 6 in the UPARR conversion area). No paved areas were surveyed. Soil from shovel test probes were sifted using quarter-inch mesh screens. Grassy areas where subsurface ground disturbance is not anticipated were surveyed with pedestrian transects only – no shovel test probes were placed in these locations.

Because it currently is underwater or otherwise obscured, the CSO outlet extending southeast into Lake Washington near the tennis courts could not be directly investigated. Research conducted by Herrera Environmental Consultants was relied on for information on the current condition of the CSO pipe.

5.4.1.2 Built Environment Inventory

HRA performed an architectural inventory of Seward Park in August 2011. Fieldwork included observation of the current conditions and photographic documentation. All elements of Seward Park's built and landscape environment older than 25 years of age were recorded on HPI forms and evaluated under the eligibility criteria of the NRHP, WHR, and City of Seattle Landmarks.

The UPARR replacement area is located within the boundaries of Lake Washington Boulevard Park. Based on the presumption that Lake Washington Boulevard is a linear resource eligible for listing in the NRHP (and currently being recorded and evaluated separate from this project under the *SR 520, I-5 to Medina: Bridge Replacement and HOV Project Programmatic Agreement*, May 2, 2011), the boulevard was not recorded or evaluated for the NRHP, and no built environment survey was performed there.

5.5 What is the historical context for the project area?

The study area is located within the traditional territory of the Duwamish Tribe. In 1855, members of the Duwamish and neighboring Puget Sound tribes signed the Treaty of Point Elliott, which provided for the removal of tribal members to reservations.

One ethnographic place name is recorded within the study area. The Duwamish called the Seward Park/Bailey Peninsula that connected the isthmus to the "mainland" by the name *Cka'lapsEb*, meaning "the upper part of one's neck" – a general term used to signify this type of land form (Waterman 1922).

Pioneer settlement came to the area near Seward Park in 1852 with an initial claim staked at Brighton Beach. The actual 277-acre peninsula that would become Seward Park was acquired by William E. Bailey in 1889. What was soon known as "Bailey Peninsula" was undeveloped, including 120 acres of old-growth forest (Tate 2010).

The Olmsted Brothers' nationally renowned landscape architecture firm prepared a plan in 1903 for Seattle's park system titled, "A Comprehensive System of Parks and Parkways," which stated that Bailey Peninsula could be the most important acquisition of the new park system (Klingle 2007, Sherwood 1973, Seattle Parks and Recreation 2011d, Talbert 2011, Hockaday 2009). In 1910 the Seattle City Council approved a $2 million parks appropriation and began acquiring properties for park purposes. As part of this effort, the Seattle City Council took ownership of Bailey Peninsula in 1911. The peninsula was immediately designated a city park and was named after William H. Seward, the U.S. Secretary of State who negotiated the purchase of Alaska in 1867. The Board of Park Commissioners noted that the peninsula was to remain substantially unaltered, which was reflected in the Olmsted Brothers 1912 plan for Seward Park. The Olmsted plan proposed preserving nearly 95 percent of the forest while incorporating improvements designed to "fit the land."

The Lake Washington Ship Canal was constructed between 1911 and 1917 to provide navigable access between Puget Sound's saltwater and Lake Washington's fresh water. Between August and October 1916, as the final dams were removed along the canal, Lake Washington was gradually lowered between 9 and 10 feet, exposing a broad, wave-cut terrace

around the lake periphery (Crowley 1999). This drop in lake level enlarged the Seward Park peninsula, and created the grassy area now leading to the Seward Park bathing beach. The proposed ground disturbance within the study area is in locations where previously submerged lake deposits were exposed when Lake Washington was lowered. Along the shoreline of Lake Washington, these submerged areas may have been previously exposed. A recent study (Troost 2011) found possible evidence of buried shorelines indicating the lake level may have been rising over the last 14,500 years with more rapid submergence in the last 1,000 years until the lake was lowered in 1916.

Seward Park continued to develop throughout the late 1920s and early 1930s, including construction of the Seward Park Inn in 1927.

During the second half of the 1930s the Civil Works Administration, and its successor the Works Progress Administration (WPA), constructed the fish hatchery complex (Hall 1934). WPA workers also constructed a comfort station, renovated the bathhouse ("Seward Park Improvements" 1936), built a bulkhead, and undertook various road improvement projects at Seward Park.

During the 1940s additional structures were built in Seward Park, including an additional comfort station, an additional concession stand (at the bathhouse), and a bathing beach raft, installed near the bathhouse and steps.

During the 1950s and 1960s improvements continued, most notably the construction of the amphitheater (1953 [seats and steps], 1956 [stage and torii]) (Brown 1950, Parks 1953, Parks 1956, Whittington 1953). In 1969 the bathhouse was again modified, this time with a large clerestory addition, to create a cultural arts center (Durning 1969, Sammons 1970).

5.6 What cultural resources were identified in the project area?

Because NHPA Section 106 consultation by the NPS is ongoing, all determinations of eligibility for historic properties presented in this chapter are pending concurrence by the SHPO.

5.6.1 Archaeology

There have been no archaeological sites previously documented within a half mile of the study area, and there are no historic period cemeteries within a half mile of the study area.

The archaeological survey areas for both the Tennis Courts and Parking Lot Alternatives and areas that are currently paved are all located on flat terraces overlooking Lake Washington. These areas are located slightly above the current lake surface, where lake deposits were exposed when the level of Lake Washington was lowered after construction of the Lake Washington Ship Canal in 1916. Prior to the lowering of the lake level, they would have been inundated. Soil here is usually 3 to 9 feet thick. Geotechnical studies conducted for the project indicate that these locations are covered by a half foot to 10 feet of stiff clay fill deposits that overlie bedrock. Given the geology and the fact that these areas were inundated, there is a low possibility for the presence of archaeological sites. There is no evidence of historic settlement

in these areas prior to development of Seward Park. No culturally significant materials were identified during shovel probe testing for either alternative.

No culturally significant materials were identified within the UPARR replacement area that is in the same location for each alternative.

The existing submerged CSO Outfall Pipe is over 25 years of age, and was recorded and evaluated as an archaeological site. It is not eligible for listing in the NRHP or WHR, and not eligible as a City of Seattle Landmark. Because the CSO Outfall Pipe is not a historic property, it was not assessed for project impacts.

5.6.2 Traditional Cultural Properties

No Traditional Cultural Properties have been identified in the study area.

5.6.3 Built Environment

The former Seward Park Inn (now the Seward Park Environmental and Audubon Center) is a designated Seattle Landmark. It is individually eligible for the NRHP and thus eligible for the WHR.

Seward Park as a whole is eligible for listing in the NRHP as a designed historic landscape under Criterion A at the local level for its association with the Olmsted Brothers firm, particularly the work of John Charles Olmsted and James Frederick Dawson, with a period of significance between 1910 and 1936. Additionally, Seward Park is eligible for listing in the NRHP at a local level as a historic district under Criterion A for its association with the general development of the City of Seattle's parks between 1910 and 1934, and for its association with federal and state relief efforts between 1935 and 1941. There are a number of contributing resources (6 buildings, 4 structures, and the fish-hatchery complex within the recommended Seward Park Historic District and Designed Landscape boundaries (Figure 5-2) that encompass the entirety of Seward Park The fish-hatchery complex comprises 6 structures and 3 buildings. (See Table 5-1 for a listing of contributing resources to the Seward Park Historic District.)

The UPARR replacement area is within Lake Washington Boulevard Park. Based on the presumption that Lake Washington Boulevard South, including its adjacent parkland, is a linear resource eligible for listing in the NRHP (and being recorded and evaluated separate from this project under the *SR 520, I-5 to Medina: Bridge Replacement and HOV Project Programmatic Agreement*, May 2, 2011), Lake Washington Boulevard Park is being treated as a historic property for this analysis.

Table 5-1. Seward Park Resources Eligible for the NRHP (Individually or as Contributing Resources within a Historic District)

Resource Name	Resource Type	Date(s) of Construction	NRHP Eligibility
Seward Park Designed Historic Landscape			
Seward Park	Designed Historic Landscape	Designated a city park in 1911	Eligible under Criterion A for its association with the Olmsted Brothers.
Seward Park Historic District			
Seward Park	Historic District	Designated a city park in 1911	Eligible under Criterion A as a historic district for its association with Seattle's park planning efforts, and for its association with federal and state relief in Seattle during the Great Depression.
Bathing Beach and Steps	Structure	Bathing beach and original bathhouse (no longer extant) c. 1926; bathing steps 1931	Contributing resource to the eligible district under Criterion A for its association with Seattle's park planning efforts.
Former Seward Park Inn	Building	1927	Individually eligible under Criterion C. Designated Seattle Landmark (2003). Contributing resource to the eligible district under Criterion A for its association with Seattle's park planning efforts.
Former Bathhouse	Building	1927; major renovation in 1940 by the WPA	Contributing resource to the eligible district under Criterion A for its association with Seattle's park planning efforts and for its association with federal and state relief in Seattle during the Great Depression.
South-Shore Bulkhead	Structure	1930s; extended in 1961; partially repaired in the early 1980s (documentary evidence is very unclear, but it appears the western half consisting of concrete riprap dates from the 1930s period of construction and was likely constructed by the WPA)	Contributing resource to the eligible district under Criterion A for its association with federal and state relief in Seattle during the Great Depression.
North-Shore Comfort Station	Building	1932 by the WPA	Contributing resource to the eligible district under Criterion A for its association with Seattle's park planning efforts.
South-Shore Comfort Station	Building	1932 by the WPA	Contributing resource to the eligible district under Criterion A for its association with Seattle's park planning efforts.

Resource Name	Resource Type	Date(s) of Construction	NRHP Eligibility
Tennis Courts and Poplar Trees	Structure	Relocated to present location sometime between 1932/1933 with second court added likely in 1934/1935; trees planted at approximate time of court construction; current surfacing, fencing, and equipment appears less than 30 years of age	Contributing resource to the eligible district under Criterion A for its association with Seattle's park planning efforts (Possible association with federal and state relief in Seattle during the Great Depression).
5 Former Trout Rearing Ponds	Fish Hatchery Complex (6 structures and 3 buildings)	1935/1936 by Washington Emergency Relief Act Workers (Civil Works Administration and Works Progress Administration)	Contributing resources to eligible district under Criterion A for their association with federal and state relief in Seattle during the Great Depression.
Footbridge			
North Caretaker's Residence			
South Caretaker's Residence			
Pump House			

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

ELIGIBLE SEWARD PARK HISTORIC DISTRICT AND DESIGNED LANDSCAPE BOUNDARIES

JANUARY 2013 | **FIGURE 5-2**

This page was left intentionally blank.

5.7 How would the proposed project affect cultural resources?

Because Section 106 consultation is ongoing, all findings of effect for historic properties presented in this chapter are pending concurrence by the SHPO.

5.7.1 Direct Impacts - Tennis Courts and Parking Lot Alternatives

5.7.1.1 During Construction

Archaeology

Only a few portions of the ground within the study area are anticipated to be disturbed by project construction. No cultural materials were identified during shovel probing in these areas. Paved areas have likely been disturbed due to previous construction. The shoreline within the project area was modified by building bulkheads and restoration work. Offshore areas were disturbed by construction, such as for the CSO outfall. Given the extent of disturbance, the geology, and the fact that these areas were inundated in recent history, there is a low possibility of the presence of archaeological sites. Therefore, construction activities related to the Tennis Courts Alternative and the Parking Lot Alternative are not expected to affect archaeological resources.

No archaeological resources were identified within the UPARR replacement area. Therefore, construction activities in the UPARR replacement area under each alternative would not affect archaeological resources.

Built Environment

Tennis Courts Alternative

Under the Tennis Courts Alternative, the removal of the tennis courts, which are a contributing resource to the Seward Park Historic District and Designed Landscape, would be an adverse effect under Section 106 of the NHPA, and a direct impact under SEPA. Although removal of the tennis courts constitutes an adverse effect on the contributing resource, the impact to the overall historic district and designed landscape would be minor. The district/landscape would retain sufficient integrity to convey its historic significance. Furthermore, the Tennis Courts Alternative proposes to reconstruct the tennis courts in almost their exact present location, thereby minimizing the adverse effect on the district/landscape. The existing bulkhead waterward from the tennis courts is not a contributing element to the historic district/landscape, and its removal and replacement would have a negligible effect on the district/landscape.

Parking Lot Alternative

Under the Parking Lot Alternative, the pump station for the Seward Park sewer system would be relocated, but the pump station is not a contributing resource to the Seward Park Historic District and Designed Landscape, and its relocation would have a negligible effect on the historic property.

There would be a minor visual impact on the former Seward Park Inn, a designated Seattle Landmark that is also eligible for the NRHP and WHR, from the Parking Lot Alternative. The proposed storage tank area would be located adjacent to the former Seward Park Inn, but the storage tank would be underground and the associated aboveground facilities would be small and likely screened by vegetation.

The removal of the south shore bulkhead, which is a contributing resource to the Seward Park Historic District and Designed Landscape, would be an adverse effect under Section 106 of the NHPA and a direct impact under SEPA. Although removal of the south shore bulkhead constitutes an adverse effect to the contributing resource, the impact on the overall historic district and designed landscape would be minor. The district/landscape would retain sufficient integrity to convey its historic significance. Furthermore, the Parking Lot Alternative proposes shoreline treatments that maintain the shoreline protection function of the bulkhead, and additionally create a natural shoreline more in keeping with the Olmsted principles and thereby minimizing the adverse effect on the district/landscape.

UPARR Conversion Area

Under both alternatives, the loss of federal UPARR protection from a small portion (3,850 square feet or less than 1 percent) of Seward Park would be considered an adverse effect under 36 CFR 800.5(a)(2)(vii) of Section 106 of the NHPA. Section 106 specifies that the "transfer, lease, or sale of property out of Federal ownership or control without adequate and legally enforceable restrictions or conditions to ensure long-term preservation of the property" is an adverse effect. Although the removal of federal control from this portion of land is considered adverse under Section 106, it is relatively minor under SEPA. The conversion areas would become the location of approximately a half dozen aboveground features related to operation of the CSO tank, but the conversion areas would likely be screened with vegetation to obscure views of the equipment. This vegetation would help restore the park with shrubs and groundcover, and support Olmsted's design principles of "sustainable design" and "unified composition." The UPARR protection that results from the federal control would be transferred to a larger piece of land along Lake Washington Boulevard.

UPARR Replacement Area

The UPARR replacement area is a scenic viewpoint that is part of Lake Washington Boulevard Park, a portion of which has been determined eligible for listing in the NRHP. As noted earlier, Lake Washington Boulevard Park is being treated as a historic property for this analysis. The effects to Lake Washington Boulevard from changes at the UPARR replacement area are the same under each alternative. The proposed landscaping enhancements in the UPARR replacement area would have an effect on Lake Washington Boulevard Park, but the effect of this small section of parkway landscaping on the overall historic property would not be adverse. The alignment of Lake Washington Boulevard Park was planned by the Olmsted Brothers specifically to achieve desired views, and the proposed project would not compromise this. Although non-native plants were a part of the Olmsted vision for Lake Washington Boulevard Park and some non-native plants would be removed, the proposed enhancements would

improve the appearance of this section of Lake Washington Boulevard Park, thereby improving travelers' views and vistas and maintaining the park boulevard's use as a "pleasure drive."

5.7.1.2 After Construction

Operation of the proposed project under the Tennis Courts Alternative and the Parking Lot Alternative would have no effect on archaeological resources or historic built environment properties.

5.7.2 Indirect Impacts – Tennis Courts and Parking Lot Alternatives

Archaeology

No archaeological resources have been identified in the study area. No archaeological resources are likely to be impacted by activities that are not part of the proposed project but that are clearly induced by the proposed project and would not occur without the proposed project. Therefore, no indirect impacts on archaeological resources are anticipated from either alternative.

Built Environment

The Seward Park Historic District and Designed Landscape and the designed landscape of Lake Washington Boulevard Park would not experience any impacts from the proposed project that are farther away in time or distance. All project-related impacts would be direct impacts, as described above. There are no other actions related to project activities for either alternative that would result in indirect impacts related to historic properties of the built environment.

5.7.3 Direct and Indirect Impacts – No Action Alternative

Under the No Action Alternative, the CSO storage tank would not be built and the shoreline treatment and transfer of grant restrictions would not be implemented. However, the City expects to replace the existing CSO outfall between 2015 and 2020 as part of the SPU Outfall Rehabilitation Program. The direct and indirect impacts of the CSO outfall replacement would be addressed by a separate SEPA environmental review process that would be conducted prior to the CSO outfall replacement.

5.8 What measures would be taken to reduce or eliminate potential impacts to cultural resources?

For both the Tennis Courts Alternative and the Parking Lot Alternative, measures would be taken to help reduce or eliminate potential impacts to cultural resources during construction.

5.8.1 Archaeology

Since no archaeological resources have been identified in the study area, no cultural resources were identified during shovel probe testing, and paved areas of the Tennis Courts Alternative and the Parking Lot Alternative have a low possibility for the presence of archaeological sites, monitoring is not necessary and no further study is needed at this time. Measures to reduce or eliminate impacts to archaeological resources include those listed below:

- Implement inadvertent discovery plan, found in the Cultural Resources Inventory report, Section 7.5. In summary, if evidence of cultural artifacts or human remains, either prehistoric or historic, is encountered during excavation, work in that immediate area would be suspended and the find would be examined and documented by a professional archaeologist in consultation with SHPO and NPS.
- If human remains are discovered during project-related construction, maintenance, or operation activities, follow procedures in *RCW 68.60: Abandoned and Historic Cemeteries and Historic Graves*, and *RCW 27.44: Indian Graves and Records*.

5.8.2 Built Environment

The project is designed so that the two alternatives are in areas of the park where they would have the least impact on the historic built environment. The proposed locations would completely avoid impacts on historic buildings, with the exception of a minor visual impact from the Parking Lot Alternative on the former Seward Park Inn. These locations also avoid impacts on all historic structures except for the tennis courts (Tennis Courts Alternative) and the south shore bulkhead (Parking Lot Alternative).

For the impact to the tennis courts, the proposed project would reconstruct the tennis courts in almost their exact present location. For the impact to the bulkhead, the proposed project includes shoreline treatments that maintain the shoreline protection function of the bulkhead, but improve the setting and create a natural shoreline, more in keeping with the Olmsted principles. The new aboveground structures for the proposed project would likely be visually screened by vegetation, minimizing the visual impacts on the surrounding district/landscape.

The alternatives both incorporate vegetation improvements that would enhance the Olmsted quality of the park by emphasizing native understory and shoreline plantings, and enhancing views. These improvements would return portions of the park back to a character that more closely resembles that envisioned by the Olmsted Brothers, and thereby minimize the effects of the proposed project on the historic park. The small portion of land in Seward Park that would lose federal protection provided by the NPS UPARR grant program for each alternative would be replaced by transferring the UPARR protection to a larger area located to the north of Seward Park, along Lake Washington Boulevard. Thus, the loss of a piece of protected green space in historic Seward Park would be replaced by the protection and enhancement of a larger piece of green space in Lake Washington Boulevard Park, landscaped with a design that is complementary to the Olmsted principles.

5.9 Would the proposed project have unavoidable adverse impacts on cultural resources?

The proposed alternatives would have an adverse effect on historic properties under NHPA Section 106 because of the removal of the historic tennis courts or the south shore bulkhead, which are contributing elements to the NRHP-eligible Seward Park Historic District and Designed Landscape, and from the removal of federal UPARR protection from a section of historic Seward Park. An adverse effect under Section 106 of the NHPA requires formal consultation as mandated in 36 CFR 800.6 to resolve the adverse effect.

NPS would conduct consultation with DAHP and other consulting parties. All terms and conditions, including measures to resolve any adverse effects, would be stipulated in a memorandum of agreement (MOA). An executed copy of the MOA or a binding commitment to those measures that avoid, minimize, or mitigate adverse effects on historic properties would also be part of the SEPA agency decision document. SPU would consult with DAHP to ensure that the stipulations of the MOA mitigate any effects to historic properties below the significance threshold for SEPA.

This page was left intentionally blank.

6 Aesthetics, Light, and Glare

6.1 What are the existing conditions of aesthetics, light, and glare in the project area?

The project sites are characterized by recreational land uses and are adjacent to single family residences. The visual landscape in Seward Park includes a mature forest in the northern two-thirds of the peninsula and a more developed, heavily used area at its southern end near the location for the project facilities. The setting includes paved parking lots, fenced tennis courts, and sections of Seward Park Road. Planted trees, shrubs, and maintained grasses surround the project area in both Seward Park and the UPARR replacement area. There are no city-designated viewpoints within the project area.

The project area has low levels of lighting and glare. The areas surrounding Parking Lot 1, Parking Lot 2, the tennis courts, and the UPARR replacement area are not illuminated. Lighting in these locations comes from sources outside the immediate area, including interior and exterior security lighting of building facilities within Seward Park, adjacent residences, street lights on roads near the park, and headlights from motor vehicles. Glare is minimal because reflective material in this area is limited. Sources of glare include lights from passing automobile or boat traffic, light reflected off building windows and automobile windshields, and sunlight reflected off Lake Washington.

6.2 How would the proposed project affect aesthetics, light, and glare?

6.2.1 Direct Impacts – Tennis Courts and Parking Lot Alternatives

The impacts would be the same for both alternatives, unless noted otherwise.

6.2.1.1 During Construction

Aesthetics

No significant impacts to aesthetics are expected in Seward Park or the UPARR replacement area during construction.

Construction activities would temporarily alter the visual character of the project sites and surrounding areas, including the construction routes. The construction activities would be visible from residential and recreational areas within and adjacent to the project area, as well as from the water. The following conceptual renderings show typical construction conditions for both the Tennis Courts Alternative and Parking Lot Alternative in Seward Park. Some viewers may find the construction activities interesting, while others may find them aesthetically unpleasant.

Light and Glare

No significant lighting or glare impacts are expected in Seward Park or the UPARR replacement area during construction. New sources of light and glare may be introduced into the project area at Seward Park. Depending on the construction schedule and hours of daylight, artificial light may be necessary to illuminate the site during the morning and late afternoon/early evening. Additionally, the site may be illuminated at night for security purposes. Any artificial lighting would be aimed away from residential areas, roadways, and Lake Washington, use the minimum wattage necessary to provide the necessary illumination, and security lighting would be similar to existing security lighting for building facilities within the park.

6.2.1.2 After Construction

Aesthetics

No significant impacts to aesthetics are expected in Seward Park or the UPARR replacement area after construction. Several changes would be noticeable, including rebuilt tennis courts, rebuilt and resurfaced parking lots, new landscaping, a new natural looking shoreline, and several aboveground features such as air exhausts and access hatches. Most of these changes would improve or alter, but not degrade, the existing visual character.

Light and Glare

No lighting or glare impacts are expected in Seward Park or the UPARR replacement area after construction.

6.2.2 Indirect Impacts - Tennis Courts and Parking Lot Alternatives

No indirect impacts were identified for the Tennis Courts Alternative or the Parking Lot Alternative.

6.2.3 Direct and Indirect Impacts – No Action Alternative

Under the No Action Alternative, the CSO storage tank would not be built and the shoreline treatment and transfer of grant restrictions would not be implemented. However, the existing CSO outfall is expected to be replaced between 2015 and 2020 as part of the SPU Outfall Rehabilitation Program. The direct and indirect impacts of the CSO outfall replacement would be addressed by a separate SEPA environmental review process that would be conducted prior to the CSO outfall replacement.

Conceptual rendering of construction of Tennis Courts Alternative

Conceptual rendering of construction of Parking Lot Alternative

6.3 What measures would reduce or eliminate potential aesthetics, light, and glare impacts?

For both the Tennis Courts Alternative and the Parking Lot Alternative, SPU would take measures to help reduce or eliminate potential impacts to aesthetics, light, and glare during and after construction. The measures would include, but are not limited to, those listed below:

- For the Tennis Courts Alternative, replace trees along the shoreline with vegetation that frames view corridors to and across Lake Washington.
- Locate the majority of the facilities underground; keep aboveground features to a minimum and likely screen with vegetation.
- Screen construction equipment staging areas to buffer views of construction equipment and materials, where feasible.
- Re-vegetate areas disturbed during construction.
- Locate and aim any artificial lighting away from adjacent roadways, residential areas, and Lake Washington; use minimum wattage necessary to provide the necessary illumination.

6.4 Would the proposed project have any significant unavoidable adverse impacts on aesthetics, light, and glare?

No significant unavoidable adverse impacts on aesthetics, light, or glare are anticipated during or after construction.

7 Habitat, Wildlife, and Fish

7.1 What habitat is present in the project area?

Habitat in the project area can be broadly divided into six categories using terms from the Seward Park Vegetation Management Plan:

1. Greensward
2. Landscaped/Ornamental
3. Grasses
4. Hardscape
5. Shoreline
6. Aquatic

Greensward west side of tennis courts

These categories are shown on Figure 7-1 and Figure 7-2. Vegetation conditions observed within these categories in the Seward Park project area are described below.

Greensward: Features native tree species, primarily Douglas fir between 6 and 18 inches in diameter at breast height (dbh), standing over mowed and un-mowed grass areas.

Landscaped Grass between tennis courts and Parking Lot 2

Landscaped/Ornamental: Features regularly maintained ornamental plantings in Seward Park. For this EIS, the Landscaped/ Ornamental category has been further divided into the following habitat types because they occur in distinct areas:

- **Landscaped/Ornamental – Grass:** Features grasses that are regularly mowed and heavily used by park visitors.
- **Landscaped/Ornamental – Shrub:** Features shrubs, including ornamentals.
- **Landscaped/Ornamental – Trees:** Features trees that may or may not include an understory of shrubs.

Landscaped Shrub adjacent to tennis courts

Grasses: Features grass areas associated with native plants and is differentiated from Landscaped/ Ornamental Grass because these areas generally contain more native grasses and may or may not be regularly mowed. This category is a component of an oak prairie area that occurs along the south side of Seward Park, extending east of the project area.

Hardscape: Features impervious surfaces such as roads, trails/paths, parking lots, and the tennis courts and provides little habitat value.

Shoreline: Features the vegetated shoreline of Lake Washington. For this EIS, this category has been further divided into the following sections:

- **Tennis Court Shoreline Wall:** Features a rock and concrete wall 4 to 5 feet tall, which forms a vertical artificial bank. Vegetation is dominated by Himalayan blackberry on the top of the rock wall, which overhangs the water. Except for one one-seed Hawthorne shrub, no other overhanging vegetation exists. A line of Lombardy poplars is present between the wall and the tennis courts. No submerged or emergent aquatic plants are present (see Figure 7-3).
- **Beach Area:** Features a low, gently sloping, grassy shoreline and a small, narrow sandy beach. Vegetation is limited to grasses along the shoreline (see Figure 7-3).
- **Parking Lot 2 Shoreline Wall:** Features a wall 4 to 5 feet tall constructed of slabs of concrete. Vegetation in this section is limited to mowed grass with a stand of White poplar trees (see Figure 7-3).
- **UPARR Replacement Area Shoreline Armoring:** Features a low wall that is less than 3 feet tall and composed of concrete rubble. Vegetation consists of grass and non-native shrubs that overhang the water in certain stretches of the shoreline. Waterward of the wall is a sand and gravel cobble beach that, in areas, contains pieces of the low rubble wall that has failed.

Aquatic: Features the area below the Ordinary High Water Mark of Lake Washington including nearshore, open water, and deep-water habitats.

Tennis Court Shoreline Wall

Beach Area

Parking Lot 2 Shoreline Wall

UPARR Shoreline Armoring

D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EIS\map_AP_DEIS_Fig07-01.mxd 12/5/2012

Legend

- Potential Limits of Construction
- Tree to be Removed
- Tree to Remain

Habitat Type

- 1 - Hardscape
- 2a - Landscaped/Ornamental Grass
- 2b - Landscaped/Ornamental Shrub
- 2c - Landscaped/Ornamental Trees
- 3 - Shoreline
- 4 - Grass
- 5 - Greensward
- 6 - Aquatic

N

0 50 100 200 Feet

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

HABITAT AND TREES IMPACTS
TENNIS COURTS ALTERNATIVE

JANUARY 2013 | **FIGURE 7-1**

This page was left intentionally blank.

D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EIS\map_AP_DEIS_Fig07-02.mxd 12/5/2012

Legend

- Potential Limits of Construction
- Tree to be Removed
- Tree to Remain

Habitat Type

- 1 - Hardscape
- 2a - Landscaped/Ornamental Grass
- 2b - Landscaped/Ornamental Shrub
- 2c - Landscaped/Ornamental Trees
- 3 - Shoreline
- 4 - Grass
- 5 - Greensward
- 6 - Aquatic

N

0 50 100 200 Feet

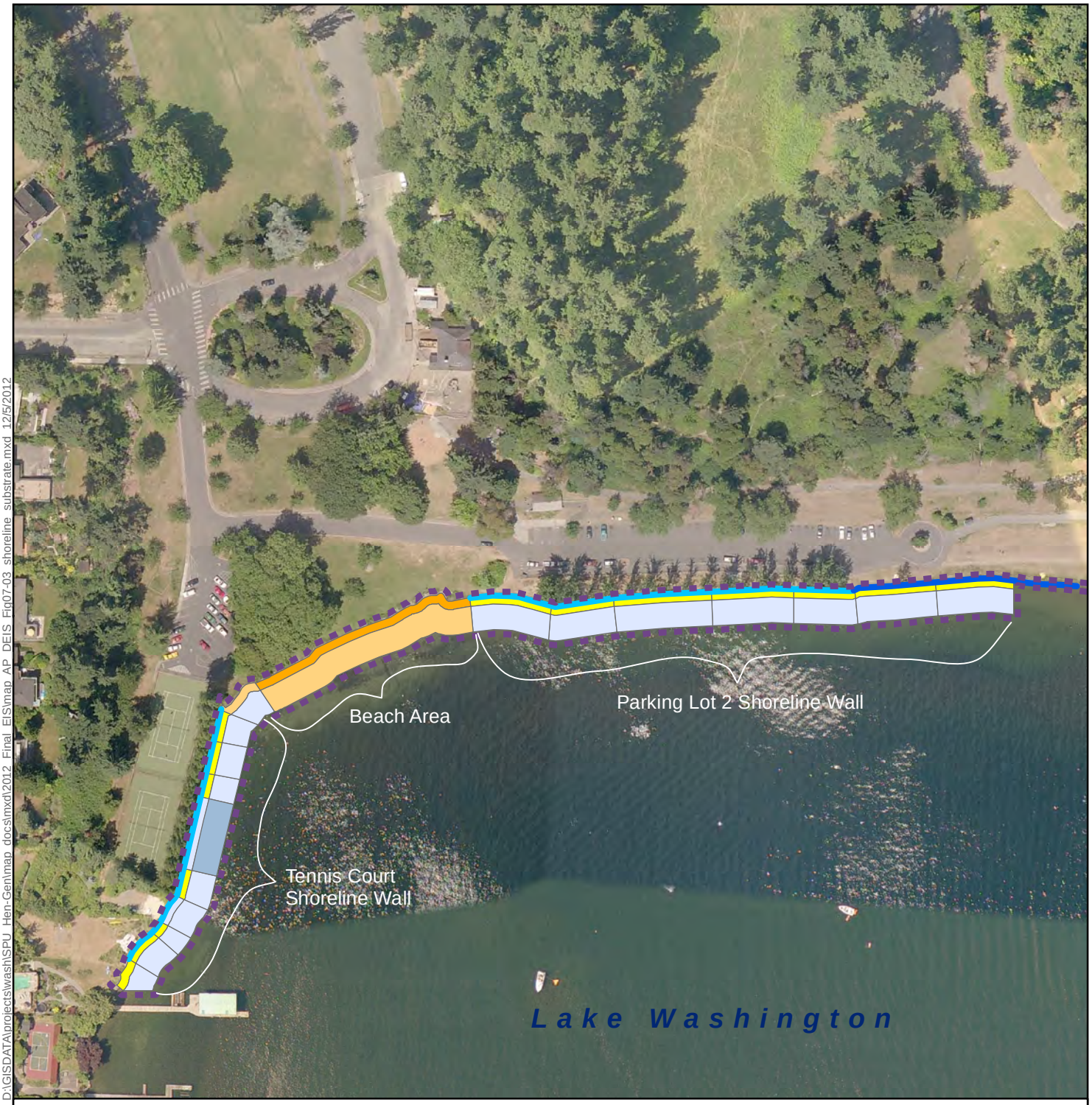
Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

HABITAT AND TREES IMPACTS
PARKING LOT ALTERNATIVE

JANUARY 2013 | **FIGURE 7-2**

This page was left intentionally blank.



D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EIS\map_AP_DEIS_Fig07-03_shoreline_substrate.mxd 12/5/2012

Legend

- Study Area

Shoreline Wall Height

- 4 - 5 ft
- 2.5 ft

Substrate Type

- Cobble (4-8 in)
- Small Cobble (2-3 in)
- Gravel (0.3-1.0 in)
- Sand & Gravel
- Sand

0 50 100 200 Feet

N

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

AQUATIC HABITAT IN SEWARD PARK PROJECT AREA

JANUARY 2013 | **FIGURE 7-3**

This page was left intentionally blank.

7.1.1 What trees are present in the project area?

The project area lies outside of the native forest areas in Seward Park. Ninety-five trees inventoried in the Seward Park project area (Urban Forestry Services, Inc. 2011) are shown on Figure 7-1 and Figure 7-2 and the species are documented in Appendix D. The UPARR replacement area contains two large Black cottonwoods, some White poplars, and young Kwanza cherry trees.

7.1.2 Are there any special status plants or habitat in the project area?

No state- or federally-listed plant species under the ESA are known to occur within Seward Park or the UPARR replacement area (DNR NHP database 2011). The project areas provide little to no habitat suitable for listed plant species, are subject to regular disturbance, and do not reflect "native" habitats. Therefore, it is unlikely that listed plant species would be present in the project areas.

Seventeen of the trees inventoried in the Seward Park project area meet the City of Seattle definition of an exceptional tree (Urban Forestry Services, Inc. 2011). An exceptional tree is a tree that: 1) is designated as a heritage tree by the City of Seattle; or 2) is rare or exceptional by virtue of its size, species, condition, cultural/historic importance, age, and/or contribution as part of grove of trees (DPD Director's Rule 16-2008). These trees are listed in Appendix D and include one Douglas fir, one Lombardy poplar, one Wych elm, one Pacific madrone, four London plane trees, and nine White poplars.

The City of Seattle identifies the shoreline areas within the project area as a Fish and Wildlife Habitat Conservation Area (FWHCA) and the shoreline is considered a Shoreline Habitat Buffer under the City's Critical Areas Ordinance (SMC 25.09). Under City of Seattle code (SMC 25.09.020), FWHCAs are defined as areas mapped by the WDFW as Priority Habitats, corridors that connect mapped Priority Habitats, areas that provide specific habitat for species of local importance, riparian corridors, and shoreline habitat. The shoreline areas within the project area provide riparian cover and shoreline habitat that support priority species.

Some portions of the unarmored shoreline may meet regulatory definitions as wetlands and these areas, and their associated buffers, also would be regulated under the City of Seattle's critical areas ordinance.

Lake Washington is designated critical habitat for Chinook salmon and bull trout – two fish species listed as threatened under the ESA. Critical habitat is a specific area of a water body containing physical or biological features, also known as primary constituent elements, or PCEs, important to fish species that may occupy the water body. Lake Washington, in the project area, is used by juvenile salmon for rearing and out-migration to Puget Sound, but not for Chinook salmon spawning. Lake Washington provides two PCEs: 1) freshwater rearing sites with habitat features supporting juvenile Chinook salmon development, growth, and mobility; and 2) a freshwater migratory corridor free of obstruction with natural cover supporting juvenile and adult Chinook mobility and survival. Lake Washington provides seven PCEs for bull trout, including: 1) migratory corridor; 2) abundant food base; 3) complex shoreline environments;

4) water temperature; 5) natural hydrograph; 6) sufficient water quality and quantity; and 7) sufficiently low levels of non-native, predatory, interbreeding, or competing fish species.

7.2 What wildlife and fish species occur in the project area?

The project area provides limited functions for wildlife, compared to native, less managed habitats because it is less diverse, contains non-native plants, and is regularly disturbed. These conditions result in the area being less able to support the abundance and diversity of wildlife found in native or less disturbed habitats.

Large trees provide perch habitat for crows and hawks using the shoreline areas. Grass areas are used by waterfowl for foraging and resting. Waterfowl, water birds, and gulls use open water areas. Birds commonly seen in the project area include American robin, American crow, Steller's jay, dark-eyed junco, black-capped chickadee, song sparrow, house sparrow, osprey, bald eagle, European starling, and northern flicker and other woodpeckers. Appendix D provides a summary of birds observed in the Seward Park project area during a June 15, 2011 site visit. Mammals expected to use habitats found within the project area include those that are tolerant of human activity, such as raccoons and opossums. Red fox and coyote have been reported in residential areas of the City of Seattle and have been observed in numerous parks. Reptiles and amphibians are less likely to occur in landscaped habitats; however, red slider and painted turtle inhabit Lake Washington (WDFW 2009).

Approximately thirty species of fish are found in Lake Washington (Appendix D). The most common fish are prickly sculpin, longfin smelt, sockeye salmon, threespine stickleback, peamouth, redside shiner, yellow perch, rainbow trout, northern pikeminnow, largescale sucker, brown bullhead, cutthroat trout, smallmouth bass, largemouth bass, and common carp (Wydoski 1972). Redside shiner spawn along the shallow, gravelly shorelines that line portions of Andrews Bay and may use shallow water habitats near the project sites. Salmon typically use deep areas of Lake Washington as a migratory corridor, but studies have found that juvenile salmon use the shoreline and nearshore areas of Seward Park (Paron and Nelson 2001). Chinook salmon have shown preference for nearshore habitats, as smolts tend to prefer shorelines that have overhanging vegetation and small woody debris (Tabor*, et al*. 2006). Sockeye salmon are known to use shoreline habitat within Lake Washington to spawn. Juvenile salmon would also be expected to use the nearshore areas in the UPARR replacement area. Juveniles rear in shallow waters of the lake, but may also inhabit these areas to avoid predators such as prickly sculpin, largemouth bass, and smallmouth bass. Sculpins are present in shallow water habitats year-round (Kahler *et al.* 2000), while largemouth and smallmouth bass move into these areas when the lake's water temperature warms (Fresh *et al.* 2003).

7.2.1 Are there any special status wildlife or fish in the project vicinity?

Bald eagles are considered a "Species of Concern" at the federal level and as a "State Sensitive" species by the WDFW. The USFWS through the Bald and Golden Eagle Protection Act also regulates impacts to individual bald eagles. Under this rule, it is illegal to harass any eagle without specific permission from the USFWS. Bald eagles were removed from the ESA list in 2007. There are two known bald eagle nests within Seward Park (Seward Park South nest and Seward Park nest). The "Seward Park South" nest is located between one-quarter and one-half mile from the project sites (International Forestry Consultants, Inc. 2005, WDFW 2011a, 2011b) and is closer to the Parking Lot Alternative than it is to the Tennis Courts Alternative. The "Seward Park" nest is more than a half mile from either of the project sites. Birds from these nests may forage near the project area and trees within the project area may serve as perches for foraging birds. Bald eagles were observed near the project area during the June 15, 2011 site visit. Bald eagles also would likely use the UPARR replacement area for foraging, dispersal, and resting, and the large trees in that area would be appropriate as perch sites.

Federally listed fish species under the ESA known to occur in the project vicinity are Chinook salmon (threatened), Steelhead trout (threatened), and bull trout (threatened).

Chinook Salmon – Chinook salmon in Lake Washington are a composite of native/wild populations and hatchery-produced populations. Chinook fry and sub-yearling juveniles have the greatest potential to occur in the project area (Tabor *et al*. 2006). Chinook juveniles use and migrate past the project area in the late spring and early summer (Kahler *et al*. 2000). Adults are not known to use the lake's nearshore or shallow water habitats in the project area.

Steelhead – A single stock of winter-run steelhead occurs in Lake Washington. Steelhead are year-round residents in freshwater systems, including the Cedar River. Juvenile steelhead primarily use Lake Washington as part of the migratory corridor between Puget Sound and spawning habitat. Steelhead remain in the deeper waters of the lake and are not dependent on nearshore habitats for rearing or migration. Thus, steelhead are not likely to occur in the project area.

Bull Trout – Adult and sub-adult bull trout have been reported infrequently in Lake Washington, and bull trout may use Lake Washington for overwintering and adult foraging. No juvenile rearing or adult spawning in the lake has been observed. Furthermore, no distinct spawning populations are known to exist in Lake Washington (Paron and Nelson 2001). Thus, bull trout are not likely to occur in the project area.

7.3 How would the proposed project affect habitat, wildlife, and fish?

7.3.1 Direct Impacts – Tennis Courts and Parking Lot Alternatives

The impacts would be the same for both alternatives, unless noted otherwise.

7.3.1.1 During Construction

No significant impacts to habitat, wildlife, or fish are expected in Seward Park or the UPARR replacement area during construction.

Construction would disturb 1.43 acres of upland habitat for the Tennis Courts Alternative and 1.36 acres for the Parking Lot Alternative in Seward Park. Table 7-1 quantifies the impact by habitat types. The disturbed habitat includes all areas within the limits of construction shown on Figure 7-1 and Figure 7-2. Vegetation disturbance would be limited to a grassy area near the northeast corner of the tennis courts for the CSO outfall replacement. In the UPARR replacement area, some lawn area as well as non-native invasive species would be removed. This impact is considered moderate because the disturbed areas are low-value, non-native habitat and would be re-vegetated with native species after construction.

Table 7-1. Seward Park Upland Habitat Disturbed for Construction

Upland Habitat Type	Area of Vegetation Disturbed			
	Tennis Courts Alternative		Parking Lot Alternative	
	(Sq ft)	(Acre)	(Sq ft)	(Acre)
Landscaped/Ornamental - Grass	40,800	0.93	41,400	0.95
Landscaped/Ornamental - Shrub	1,500	0.03	1,300	0.03
Landscaped/Ornamental - Trees	12,700	0.29	1,000	0.02
Shoreline	1,400	0.03	1,300	0.03
Grass	1,200	0.02	14,000	0.32
Greensward	5,000	0.11	400	0.01
Total	62,600	1.43	59,400	1.36

A total of 43 trees, including two “exceptional trees” would be removed in Seward Park for the Tennis Courts Alternative (see Figure 7-1) and 26 trees, including ten “exceptional trees,” for the Parking Lot Alternative (see Figure 7-2). A summary of the tree removal is shown in Table 7-2 and the specific trees are documented in Appendix D. The majority of the trees removed for the Tennis Courts Alternative would be a stand of Lombardy poplars along the water’s edge. The majority of the trees removed for the Parking Lot Alternative would be a stand of White poplars along the water’s edge. Tree removal primarily affects non-native trees, many of which are approaching the end of their normal life expectancy. Removal of the trees would diminish the tree canopy, which would reduce shade, perches, and nesting sites for wildlife, and wildlife may be expected to use habitats adjacent to the Tennis Courts Alternative more than the areas

adjacent to the Parking Lot Alternative since this area has been planted with many native species and because there is less human activity in this area. Approximately 0.3 acres of canopy would be removed for the Tennis Courts Alternative and 0.2 acres for the Parking Lot Alternative. Tree removal would affect less than 1 percent of the approximate 167 acres of tree canopy in Seward Park. No trees would be removed in the UPARR replacement area.

Habitats within the limits of construction would be unavailable to wildlife and fish during construction. Wildlife and fish in adjacent areas may be disturbed by construction activities and noise and may temporarily move to other areas of Seward Park, Lake Washington Boulevard Park, or the lake shoreline. This impact is short-term and nonsignificant because wildlife and fish likely would return to the project area once construction is complete and because, in Seward Park, the impacted shoreline habitat is only about 3 percent of the shoreline habitat.

Table 7-2. Seward Park Trees Removed for Construction

Tree Type	Number of Trees Removed	
	Tennis Courts Alternative	Parking Lot Alternative
Lombardy poplar	21	n/a
White poplar	n/a	16
Douglas fir	11	n/a
Kwanzan cherry	2	6
London plane	n/a	3
Tulip tree	n/a	1
European white birch	2	n/a
Oregon ash	1	n/a
Common hawthorn	1	n/a
Incense cedar	1	n/a
Deodar cedar	1	n/a
Fruiting apple	1	n/a
Scots pine	1	n/a
Plum	1	n/a
Total	43	26

Construction-related decreases in water quality, if not controlled or contained, could impact aquatic habitat and fish species, including temporarily displacing organisms or having direct toxic impacts on aquatic organisms. Following are sources of potential decreases in water quality; however, the proposed project would include erosion and sediment controls, spill control and prevention, and other best management practices, such as silt curtains to avoid uncontrolled discharges that could affect water quality:

1. Runoff from construction areas carrying sediment (thus contributing to increased turbidity) and other pollutants into the lake.
2. Oil, solvents, and other chemical spills flowing into Lake Washington.
3. Soil contaminants (e.g., petroleum, metals, semi-volatile, and volatile organic compounds) from previous CSO discharges disturbed during the outfall replacement and released into the lake.
4. Disturbance of lake bottom sediments during the outfall replacement, thus contributing to increased turbidity.

Some benthic aquatic invertebrates could be buried by placement of materials on the bottom of Lake Washington, such as gravel, rocks, boulders, and large woody debris. Mobile organisms, such as fish and invertebrates, could move away from the disturbed area, and would likely return to the area after construction is complete. The amount of area that would be covered is a small portion of the lake bed and benthic invertebrates would recolonize from undisturbed areas fairly rapidly.

The proposed project is not anticipated to adversely impact nesting activity by the bald eagles because the nests are highly urbanized, the birds at the two nests are accustomed to increased noise, and the closest nest is located more than a quarter mile from the project area.

7.3.1.2 After Construction

No significant impacts to habitat, wildlife, and fish are expected in Seward Park or the UPARR replacement area after construction. The aquatic food web that supports fish and wildlife in the area would be improved by better water quality resulting from reduced occurrences of CSOs into Lake Washington. Shoreline habitats would be enhanced by the incorporation of native plants, overhanging plants that provide shade and cover, improved shallow water habitats, such as the addition of large woody debris or other features that would provide cover for fish, and the removal of invasive, non-native plants. Final designs would be developed that would favor continued survival of juvenile salmon species and discourage use of the area by non-native predatory fish species such as bass. A re-vegetation plan would be implemented; however, trees planted as part of the plan would need to grow for many years before the wildlife benefits would be restored. These improvements may encourage increased use by wildlife and fish.

7.3.2 Indirect Impacts – Tennis Courts and Parking Lot Alternatives

The proposed project would improve habitat and animal populations over time as water quality continues to improve and the re-vegetation reaches maturity and provides improved habitat.

7.3.3 Direct and Indirect Impacts - No Action Alternative

Under the No Action Alternative, the CSO storage tank would not be built and the shoreline treatment and transfer of grant restrictions would not be implemented. However, the existing CSO outfall is expected to be replaced between 2015 and 2020 as part of the SPU Outfall Rehabilitation Program. The direct and indirect impacts of the CSO outfall replacement would be addressed by a separate SEPA environmental review process that would be conducted prior to the CSO outfall replacement.

Without building the CSO storage tank, a long-term average of more than one untreated combined sewage and stormwater discharge from Basin 44 per year likely would occur when the sewer system's capacity is exceeded. This would continue the current negative impact on habitat, wildlife, and fish that live in or migrate through Lake Washington.

7.4 What measures would reduce or eliminate potential impacts to habitat, wildlife, and fish?

For both the Tennis Courts Alternative and the Parking Lot Alternative, SPU would take measures to help reduce or eliminate potential impacts to habitat, wildlife, and fish during and after construction. The measures would include, but are not limited to, those listed below:

- Limit work in Lake Washington during specific seasonal windows (July 16 – December 31) to avoid adverse impacts to fish.
- Limit construction disturbances to the minimum area needed, the shortest duration, and the greatest distance away from water bodies, as practicable.
- Develop and implement a Construction Stormwater and Erosion Control Plan (CSECP), including a Stormwater Pollution Prevention Plan (SWPPP) and Spill Prevention and Countermeasures Plan (SPCP), to reduce the potential for sediment, waste materials, construction-related leaks and spills to contaminate surface, ground, and runoff water.
- Implement measures to contain turbidity (e.g., sheeted trenches, silt curtains) for in-water work related to the CSO pipe replacement.
- Take appropriate precautions when storing equipment, hazardous fuels, and other materials used in construction of the project.
- Provide an emergency response plan in accordance with the SPU spill prevention plan and know proper hazardous material storage, handling, and emergency procedures, including spill notification and response requirements.
- Implement appropriate BMPs from the City of Seattle's Stormwater Code SMC 22.800 – 22.808, Director's Rule: 2009-004 SPU/16-2009 DPD, and Volume 2 Construction Stormwater Control Technical Requirements Manual to control erosion and sediment transport from the project site during construction.
- Provide water quality treatment as necessary to improve the quality of stormwater flows from adjacent impervious surfaces.

- Develop and implement a revegetation plan in accordance with the Seward Park Vegetation Management Plan.

7.5 Would the proposed project have significant unavoidable adverse impacts on habitat, wildlife, or fish?

No significant unavoidable adverse impacts on habitat, wildlife, or fish are anticipated during or after construction.

8 Transportation

8.1 What areas would experience increased traffic due to project activities?

Construction and operations-related traffic likely would access Seward Park via Rainier Avenue South. For simplicity, the route is called the "construction route." The increased traffic between Rainier Avenue South and Seward Park is the focus of the transportation analysis because that area has smaller streets where increased traffic would be more noticeable. Rainier Avenue South is a major arterial and, thus, the increased traffic on it would not be perceptible (less than a one percent increase).

Construction Route 1 Access – looking west

Two potential construction routes were identified based on trucks being able to travel safely and effectively and causing the least impact to local streets. Figure 8-1 shows the potential construction routes. Route 1 would access Seward Park via South Orcas Street and Lake Washington Boulevard South. Route 2 would access Seward Park via South Genesee Street and Lake Washington Boulevard South. Both construction routes would work for either the Tennis Courts Alternative or the Parking Lot Alternative, because the project sites are close together. Streets south of the Tennis Courts and Parking Lot Alternatives project areas were not considered because most of these streets are too narrow with on-street parking.

Construction Route 2 Access – looking northwest

A portion of Construction Route 2 is anticipated to be used for construction access to the UPARR replacement area.

8.2 What are existing traffic conditions in the impacted areas?

The level of service (LOS) at key intersections was used to assess existing traffic conditions, as well as to estimate traffic conditions during construction. Letters (from A to F) designate each service level, with LOS A representing the best operating conditions and LOS F the worst (TRB 2000). LOS at intersections is measured in terms of the time delay to vehicles resulting from traffic control at intersections. Figure 8-1 shows the intersections included in the study. The modeling results for existing conditions show that the intersections along the potential construction routes currently operate at LOS C or better (see Appendix D for additional detail).

Levels of Service Definitions

LOS A – Motorists experience little or no delays and traffic levels are well below roadway capacity.

LOS B – Motorists experience no significant delays and traffic operates reasonably unimpeded at average speeds.

LOS C – Motorists experience some delays and queues may occur; traffic operates at a stable level.

LOS D – Motorists experience noticeable congestion and speeds are reduced.

LOS E – Motorists experience significant delays and traffic progression is poor.

LOS F – Motorists experience very long delays and traffic levels exceed roadway capacity.

8.3 What public transit and bicyling options exist in the impacted area?

Seattle Metro Routes 34 and 39 serve the Seward Park area. Buses on these routes travel along 50th Avenue South, South Dawson Street, Seward Park Avenue South, South Orcas Street, and Wilson Avenue South. Farther west, Metro Routes 7 and 9 follow Rainier Avenue South.

In the Seattle Bicycling Guide Map, the Seattle Department of Transportation identifies Lake Washington Boulevard South as a “higher traffic street” with no on-street bicycle lane (SDOT 2011). However, Lake Washington Boulevard South is popular with bicyclists. During designated Sundays from May through September, Seattle Parks and Cascade Bicycle Club sponsor “Bicycle Sundays.” On these Sundays, Lake Washington Boulevard South is closed to motor vehicles from south of Mount Baker Beach to Seward Park’s entrance (Parks 2011c). The intent of the program is to provide a bicycle- and pedestrian-friendly recreation corridor.

D:\GIS\DATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EIS\map_AP_DEIS_Fig08-01_const_routes.mxd 12/5/2012

Legend

- Potential Project Areas
- Study Intersection
- Potential Construction Route 1
- Potential Construction Route 2

0 375 750 1,500 Feet

N

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

POTENTIAL CONSTRUCTION ROUTES

JANUARY 2013

FIGURE 8-1

This page was left intentionally blank.

8.4 How would the proposed project affect transportation?

8.4.1 Direct Impacts – Tennis Courts and Parking Lot Alternatives

The impacts would be the same for both alternatives, unless noted otherwise.

8.4.1.1 During Construction

No significant impacts to transportation are expected near Seward Park or the UPARR replacement area during construction.

Temporary increases in traffic volume and delay could occur on some streets and intersections in the project vicinity due to transporting equipment and materials to and from the site and construction worker commutes. Additionally, park visitors who normally walk to Seward Park might be deterred by the construction and drive to another park, thus increasing traffic. Based on traffic modeling, the LOS would remain at C or better during construction, except for one location (see Appendix D). That exception would occur at the intersection of South Genesee Street and 50th Avenue South where the maximum increase in delay would be 3.5 seconds per vehicle and the LOS would decrease to D. Most drivers would not even perceive this short additional delay.

Temporary damage to roads by the large construction vehicles along the construction route, including the entrance to Seward Park, could occur. A conditions assessment would be performed on the construction route prior to the proposed project so roads could be restored to their prior condition or better after construction is complete.

Bicyclists could be impacted by the presence of large construction trucks, in addition to the traffic and delay impacts discussed above. Trucks would not be present during the entire construction period and bicyclists would be notified of alternate routes such as the neighborhood streets and the Lake Washington Boulevard Path.

There are no anticipated impacts to buses or bus routes, aside from the general traffic and delay impacts discussed above, because no roads would be closed during construction and no bus stops would be affected.

8.4.1.2 After Construction

No significant impacts to transportation are expected near Seward Park or the UPARR replacement area after construction.

Vehicle trips to the project sites would be necessary. The most common visits to Seward Park by SPU maintenance staff would occur quarterly and after a CSO event and would typically require only one vehicle. In the first year or so of use, SPU staff may elect to visit the site periodically during or after a CSO event, which would also require only one vehicle. A watering truck would visit Seward Park and the UPARR replacement area weekly throughout the summer to water new plants during their establishment period, which is a minimum of three years. The frequency and number of vehicles represent a very small portion of the overall traffic in the project vicinity.

8.4.2 Indirect Impacts – Tennis Courts and Parking Lot Alternatives

A moderate and temporary, indirect impact would result from traffic and altered traffic patterns along alternate routes. Some vehicle and bicycle traffic might use alternate routes during construction to avoid traffic associated with the proposed project.

8.4.3 Direct and Indirect Impacts – No Action Alternative

Under the No Action Alternative, the CSO storage tank would not be built and the shoreline treatment and transfer of grant restrictions would not be implemented. However, the existing CSO outfall is expected to be replaced between 2015 and 2020 as part of the SPU Outfall Rehabilitation Program. The direct and indirect impacts of the CSO outfall replacement would be addressed by a separate SEPA environmental review process that would be conducted prior to the CSO outfall replacement.

8.5 What measures would reduce or eliminate potential impacts associated with transportation?

For both the Tennis Courts Alternative and the Parking Lot Alternative, SPU would take measures to help reduce or eliminate potential impacts associated with transportation during and after construction. The measures would include, but are not limited to, those listed below:

- Schedule the construction of project elements so they do not overlap, when possible, to reduce the number of vehicle trips occurring at one time.
- Provide information at Seward Park and on SPU and Seattle Parks websites regarding alternate routes drivers and bicyclists could use to avoid construction traffic.
- Perform a condition assessment on the construction route prior to the proposed project so roads could be restored to their prior condition or better.

8.6 Would the proposed project have any significant unavoidable adverse impacts associated with transportation?

No significant unavoidable adverse impacts associated with transportation are anticipated during or after construction.

9 Water Resources

9.1 What surface water resources exist in the project area?

Lake Washington is the only surface water body in the project area. Lake Washington is in a deep, narrow glacial trough with steeply sloping sides and covers approximately 21,500 acres. It is 22 miles long, with an average width of approximately 1.5 miles and a circumference of 50 miles. Lake Washington is part of Ecology's Water Resource Inventory Area 8 and most of the shoreline is developed. The lake volume is approximately 2,350,000 acre-feet, with an average depth of 108 feet and a maximum depth of 214 feet (King County 2011).

The level of Lake Washington dropped approximately 9 feet in 1916 due to construction of the Hiram M. Chittenden Locks and the Lake Washington Ship Canal. Surface water levels of Lake Washington are currently managed by the U.S. Army Corps of Engineers (Corps), which maintains the lake between 16.8 feet in the winter and 18.6 feet in the summer (City of Seattle Datum, NAVD 88).

The main sources of fresh water for Lake Washington are the Cedar and Sammamish Rivers. Numerous small creeks and surface runoff also contribute fresh water to the lake. Lake Washington drains via the Lake Washington Ship Canal, Lake Union, and the Hiram M. Chittenden Locks to Puget Sound.

Water quality regulations applicable to Lake Washington include the Clean Water Act (CWA) (33 U.S. Code [USC] 1251-1376), which requires that all states restore their waters to be "fishable and swimmable." Washington's Water Quality Assessment, which lists the water quality status for water bodies in the state, meets the federal requirements under Sections 303(d) and 305(b) of the CWA. Washington's water quality standards are documented in WAC 173-201A and are based on designated and potential uses of water bodies.

The portion of Lake Washington in the project area is not designated as impaired by the 303(d) list and does not exceed established water quality standards for lake class waters (Ecology 2008). However, untreated stormwater runoff and periodic CSO events likely cause localized changes in water quality. A recent study of SPU's CSO discharges found conventional contaminants (e.g., fecal coliform, total suspended solids, biochemical oxygen demand), metals, and semi-volatile and volatile organic compounds present in the CSO discharges (SPU 2010). An average of 17 CSO discharges per year has occurred in Basin 44, from 1998 through 2011 (HDR 2012b). The runoff from Parking Lots 1 and 2 does not currently receive stormwater treatment.

9.2 What groundwater resources exist in the project area?

Groundwater from adjacent upland areas generally flows toward Lake Washington. Groundwater levels in and near the project area generally coincide with the lake level (Shannon & Wilson, Inc. 2011). Borings completed for this project were drilled to depths of 65 feet and did not encounter confined aquifers that are under pressure. The primary beneficial use of groundwater within the project area is as a source of recharge for Lake Washington.

9.3 How would the proposed project affect surface water and groundwater?

9.3.1 Direct Impacts - Tennis Courts and Parking Lot Alternatives

The impacts would be the same for both alternatives, unless noted otherwise.

9.3.1.1 During Construction

No significant impacts to surface water or groundwater are expected in Seward Park or the UPARR replacement area during construction.

If uncontrolled, surface water runoff from construction areas could potentially carry sediment and other pollutants into Lake Washington. Oil, solvents, and other chemical spills could occur within construction limits, and, if of sufficient quantity and not contained, could flow into Lake Washington or seep into the ground and perhaps reach groundwater. If disturbed during outfall replacement, soil contaminants (e.g., petroleum, metals, semi-volatile and volatile organic compounds) associated with previous CSO discharges from the existing outfall could potentially be released into lake water. If not controlled or contained, these occurrences could locally affect surface water or groundwater quality, or both. The proposed project would include erosion and sediment controls, spill control and prevention, and other best management practices, such as silt curtains to avoid uncontrolled discharges that could affect water quality.

Groundwater likely would be encountered during construction due to the excavation depth of greater than 30 feet for installation of the CSO storage tank. Some temporary, localized lowering of the groundwater table in the immediate vicinity of the storage tank would be expected during construction, due to necessary dewatering operations either inside or outside the excavation, or both. This impact is considered minor because standard construction methods would be implemented to limit the need for extensive dewatering and because dewatering water would be settled and discharged to either Lake Washington or the combined sewer system.

9.3.1.2 After Construction

A significant improvement to surface water is expected in Seward Park after construction because of the reduction in number and volume of CSO events. No significant impacts to surface water or groundwater are expected in the UPARR replacement area after construction.

The number of CSO events from Basin 44 would be reduced to a long-term average of no more than one event per year, and the volume would be reduced as well. Untreated stormwater that is currently discharged into Lake Washington from Parking Lot 1 for the Tennis Courts Alternative, or Parking Lot 2 and the access road to it for the Parking Lot Alternative, would receive treatment. The stormwater likely would be managed using Natural Drainage Systems techniques to the maximum extent feasible and treated using filter vaults. These impacts would have a significant, positive impact on water quality.

Significant permanent, post-construction impacts to the groundwater regime (level, flow, etc.) are not anticipated. At the end of construction, any dewatering systems would be shut down, and the groundwater table would be expected to approximately resume its pre-construction level.

9.3.2 Indirect Impacts – Tennis Courts and Parking Lot Alternatives

After project construction, the Tennis Courts Alternative and the Parking Lot Alternative would benefit the ecosystem over time as pollutant loading in the lake continued to decrease and water quality improved.

9.3.3 Direct and Indirect Impacts – No Action Alternative

Under the No Action Alternative, the CSO storage tank would not be built and the shoreline treatment and transfer of grant restrictions would not be implemented. However, the existing CSO outfall is expected to be replaced between 2015 and 2020 as part of the SPU Outfall Rehabilitation Program. The direct and indirect impacts of the CSO outfall replacement would be addressed by a separate SEPA environmental review process that would be conducted prior to the CSO outfall replacement.

Without building the CSO storage tank, a long-term average of more than one untreated combined sewage and stormwater discharge from Basin 44 per year likely would occur when the sewer system's capacity was exceeded. This would continue the current negative impact on water quality in Lake Washington, as well as violate federal and state law.

9.4 What measures would reduce or eliminate potential impacts to surface water and groundwater?

For both the Tennis Courts Alternative and the Parking Lot Alternative, SPU would take measures to help reduce or eliminate potential impacts to surface water and groundwater during and after construction. The measures would include, but are not limited to, those listed below:

- Limit construction disturbances to the minimum area needed, the shortest duration, and the farthest distance away from water bodies, as practicable.
- During construction, implement Best Management Practices (BMPs), as identified in the City of Seattle's Stormwater Code SMC 22.800 – 22.808, Director's Rule: 2009-004 SPU/16-2009 DPD, and Volume 2 Construction Stormwater Control Technical Requirements Manual to control erosion and sediment transport from the project site.

Typical measures include silt fencing, plastic sheeting, and straw wattles to prevent sediment discharge.

- Develop and implement a Construction Stormwater and Erosion Control Plan (CSECP), including a Stormwater Pollution Prevention Plan (SWPPP) and Spill Prevention and Countermeasures Plan (SPCP) to reduce the potential for sediment, waste materials, construction-related leaks and spills to contaminate surface, ground, and runoff water.
- Provide water quality treatment as necessary to improve the quality of intercepted stormwater flows from adjacent impervious surfaces.
- Re-vegetate disturbed shorelines.

9.5 Would the proposed project have any significant unavoidable adverse impacts on water resources?

No significant unavoidable adverse impacts on water resources are anticipated during or after construction.

10 Air Quality, Odor, and Climate Change

10.1 What are the existing air quality and odor conditions in the project area?

The Washington Department of Ecology and the Puget Sound Clean Air Agency (PSCAA) have adopted state and local air quality standards that are equivalent to, or more stringent, than the National Ambient Air Quality Standards (NAAQS). Air quality data indicate that concentrations have been below the NAAQS for all criteria pollutants monitored in the project area. Table 10-1 shows a summary of air quality data at the Beacon Hill Reservoir monitor from 2004 to 2008 (PSCAA 2009).

Table 10-1. Ambient Pollutant Concentrations at Beacon Hill Reservoir Monitor

Pollutant	Parameter	Puget Sound Air Quality Standard	Data Year				
			2004	2005	2006	2007	2008
Nitrogen dioxide (NO_2)	Annual average (ppm)	0.053	0.018	0.018	0.018	ND	ND
Carbon monoxide (CO)	8-hour average (ppm)	9	1.8	1.9	1.5	1.0	0.9
	1-hour average (ppm)	35	2.7	2.7	2.3	1.4	1.4
Ozone	8-hour average (ppm)	0.075	0.057	0.049	ND	0.05	0.052
Sulfur dioxide (SO_2)	Annual average (ppm)	0.02	0.003	0.004	ND	0.002	0.001
	24-hour average (ppm)	0.1	0.019	0.014	ND	0.007	0.011
	1-hour average (ppm)	0.4	0.06	0.044	ND	0.039	0.073
Particulate matter (PM_{10})	24-hour average ($\mu g/m^3$)	150	33	30	42	ND	ND
Particulate matter ($PM_{2.5}$)	Annual arithmetic mean ($\mu g/m^3$)	15	8.51	7.95	7.94	7.19	7.25
	24-hour average ($\mu g/m^3$)	35	32.6	27.6	25.7	29.4	20.5

PPM = parts per million
PM_{10} = particulate matter 10 micrometers or less
$PM_{2.5}$ = particulate matter 2.5 micrometers or less
ND = No Data

Odors can be generated from wastewater conveyed in a pipeline or stored in a pump station wet well or storage tank. Odors can become a problem if they are released into the environment at maintenance holes, access points, or other structures.

There are no numerical standards for odors; however, per PSCAA Regulation I, Section 9.11, it is illegal to injure human health, plant or animal life, or property, or unreasonably interfere with enjoyment of life and property. Enforcement actions can be taken if odors exceed a certain qualitative level.

SPU manages infrastructure to minimize odor emissions and monitors odor complaints to ensure compliance with local and state odor regulations. In 2007, SPU issued an informal, odor-related study of its wastewater system (SPU 2007). The study reviewed 676 odor complaints received between 1990 and 2005. Only two odor complaints were caused by SPU CSO facilities.

10.2 What are "climate change" and "climate variability," and how would they affect the project area?

"Climate change" is a significant change in measures of climate (such as temperature, rain, snow, and wind) for an extended period, typically decades or longer (USEPA 2009). The causes of climate change are both natural and human-made. "Climate variability" is similar to climate change, except that it occurs on shorter time scales.

Climate change and climate variability have implications for temperature, sea level, snow and ice, and rainfall in the project area. Table 10-2 shows the implications that have been documented in the past and that are predicted for the future in the Northwest.

Table 10-2. Implications of Climate Change and Climate Variability

Climate Element	Climate Change[1]	Climate Variability[2]	
		El Niño / Warm Phase PDO[3]	La Niña / Cool Phase PDO[3]
Temperature:	Increase average temperatures Increase extreme temperatures	Increase temperature in winter	Decrease temperature in winter
Sea Level:	Increase	n/a	n/a
Snow and Ice:	Decrease	Decrease	Increase
Rainfall:	Increase average rainfall Increase rainfall in winter Decrease rainfall in summer Increase extreme rainfall All of above less dominate than effects of climate variability	Decrease rainfall in winter	Increase rainfall in winter

[1] Source: CIG 2011 a
[2] Source: CIG 2011 b
[3] PDO is Pacific Decadal Oscillation

10.3 How would the proposed project affect air quality, odor, and climate change?

10.3.1 Direct Impacts – Tennis Courts and Parking Lot Alternatives

The impacts would be the same for both alternatives, unless noted otherwise. Park facilities, such as the children's playground, are closer to the Parking Lot Alternative than the Tennis Courts Alternative. Nearby residences on Seward Park Avenue South and Lakeshore Drive South are approximately 300 feet closer to the Tennis Courts Alternative than the Parking Lot Alternative. Therefore, park users would be more impacted by any localized air quality and odor issues for the Parking Lot Alternative (compared to the Tennis Courts Alternative) and nearby residents would be more impacted by the Tennis Courts Alternative (compared to the Parking Lot Alternative).

10.3.1.1 During Construction

No significant impacts to air quality, odor, or climate change are expected to occur in Seward Park or the UPARR replacement area during construction.

Dust generated from surface disturbances or by wind action is termed **"fugitive dust"** because it is not discharged to the atmosphere in a confined flow stream. Common sources of fugitive dust include heavy construction operation, storage piles, and unpaved roads.

Air Quality

No significant impacts to air quality are expected in Seward Park or the UPARR replacement area during construction.

Particulate matter, in the form of fugitive dust, would be generated by construction activities such as excavation, grading, and demolition of structures and pavement. Based on a United States Environmental Protection Agency (USEPA) formula that relates fugitive dust emissions to the area of impact and duration of construction activity, the Seward Park components could result in approximately one half ton of fugitive dust generated per month of excavation and clearing activity[1]. The actual volume of fugitive dust would be highly variable and would depend on many factors, including soil moisture content, wind speeds, and the duration of the clearing activity, among other considerations. The UPARR replacement area that would be cleared is much smaller; therefore, the likelihood that fugitive dust would be generated in substantial amounts is even less. It is unlikely that fugitive dust emissions would be generated in substantial amounts given the moisture conditions in the Puget Sound region.

Carbon dioxide and nitrogen dioxide would be generated by the exhaust emissions from heavy trucks and construction equipment. The emissions would be temporary, limited to the immediate area surrounding the construction site, and would contribute a small amount to the total emissions in the vicinity compared with the automobile traffic because construction traffic would be less than one percent of the total traffic in the project vicinity.

[1] Air quality impacts of fugitive dust were estimated using USEPA's AP-42, Compilation of Air Pollutant Emission Factors (USEPA 2011). AP-42 emission factors estimate fugitive dust emissions based on the area of impact and the duration of the construction activity. For fugitive dust due to construction, emissions were estimated using the following equation: *PM Emissions = 1.2 tons PM/acre/month of activity.*

Odor

Construction odors such as those from diesel exhaust or from laying asphalt pavement might be noticeable by park users or nearby residents. While odors could become relatively intense at times, a limited number of construction vehicles would operate at any one time and the amount of asphalt pavement required for the proposed project would be limited (approximately 60,000 square feet).

Climate Change

Greenhouse gases would be produced, which could impact climate change. Greenhouse gas production would primarily be associated with emissions from construction equipment and commuter vehicles, as well as embodied energy. "Embodied energy" is the energy necessary for the entire product lifecycle beginning with raw material extraction and ending with deconstruction or decomposition. The anticipated amount of greenhouse gases for the work in Seward Park is approximately 38,000 metric tons equivalent carbon dioxide for the Tennis Courts Alternative and 39,000 metric tons equivalent carbon dioxide for the Parking Lot Alternative, approximately 95 percent of which is from embodied energy. Summaries of the lifetime greenhouse gas emissions are provided in Appendix D. The greenhouse gas emissions for the UPARR replacement area were not calculated but are anticipated to be minor since no structures would be built, the number of vehicles and equipment involved is small, and the construction period would be only 4 to 6 weeks. This impact is considered minor because the amount of greenhouse gas emissions anticipated by the proposed project is far less than 1 percent of the estimated greenhouse gas emissions in Seattle for the year 2008 (City of Seattle 2008).

10.3.1.2 After Construction

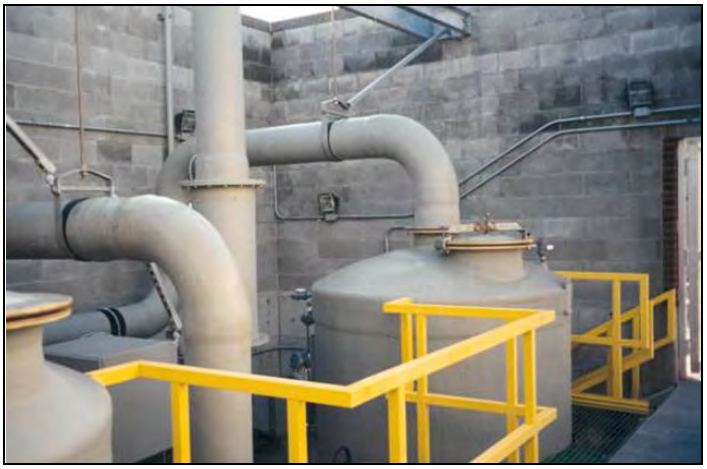
No significant impacts to air quality, odor, or climate change are expected to occur in Seward Park or the UPARR replacement area after construction.

Air Quality

No direct impacts related to air quality are anticipated after construction because no activities would occur that would generate fugitive dust emissions.

Odor

Odors could be generated during operation of the proposed project at the diversion weir (due to turbulence) or the CSO storage tank (due to the increased detention time). The level of odor emissions would depend on the wastewater characteristics (dissolved sulfide, dissolved oxygen, pH, temperature, etc.), wastewater



Typical odor control equipment for CSO storage tank

hydraulics, and facility operation (cleaning, etc.). The level of odor emissions likely will be dampened because the sewage would be diluted with stormwater and the tank would have an automated cleaning system, be maintained at slightly negative pressure to minimize fugitive odor emissions, and include an odor control system.

Climate Change

Greenhouse gases would be emitted by SPU maintenance staff vehicles when they visit the CSO storage tank facility. The associated estimated annual greenhouse gas emissions are approximately 0.06 metric tons equivalent carbon dioxide, for either alternative. This impact is considered minor because the amount of greenhouse gas emissions anticipated for operation of the proposed project is far less than 1 percent of the estimated greenhouse gas emissions in Seattle in 2008 (City of Seattle 2008).

10.3.2 Indirect Impacts – Tennis Courts and Parking Lot Alternatives

There may be an increase in park use at other parks, if Seward Park users avoid the project area due to air quality or odor issues. Project-related construction truck traffic could lead some drivers along the construction route to use alternate routes to avoid potential delays. Using alternate routes could lead to indirect effects in two ways: alternate routes could be longer and, therefore, cause increased emissions, and alternate routes would cause additional emissions in areas outside of the proposed construction routes.

10.3.3 Direct and Indirect Impacts – No Action Alternative

Under the No Action Alternative, the CSO storage tank would not be built and the shoreline treatment and transfer of grant restrictions would not be implemented. However, the existing CSO outfall is expected to be replaced between 2015 and 2020 as part of the SPU Outfall Rehabilitation Program. The direct and indirect impacts of the CSO outfall replacement would be addressed by a separate SEPA environmental review process that would be conducted prior to the CSO outfall replacement.

10.4 How would climate change and climate variability affect the proposed project?

Climate change and climate variability have the potential to impact the proposed project due to increases in sea level and rainfall.

Sea level rise associated with climate change would range from 6 inches to 50 inches in Puget Sound, with the mostly likely rise of 34 inches by 2100 (UW and Ecology 2008). Sea level rise theoretically could impact the proposed project since the project sites are located adjacent to Lake Washington, which is hydrologically connected to Puget Sound and the Pacific Ocean. However, sea level rise is not anticipated to impact the proposed project because the Corps maintains Lake Washington at levels that are lower than the elevation of the project sites.

Climate change and some aspects of climate variability (La Niña and cool phase PDO) are expected to increase rainfall in the winter. Increased rainfall likely means an increase in stormwater runoff from impervious surfaces in the basin. The capacity of the CSO storage tank has been designed to accommodate a six percent increase in precipitation and associated stormwater over the current levels. Six percent is within the range of precipitation increase predicted by analyses for the Pacific Northwest (MGS 2003). Therefore, the CSO storage tank has been designed to address the changes expected from climate change and climate variability.

10.5 What measures would reduce or eliminate potential impacts to air quality, odor, or climate change?

For both the Tennis Courts Alternative and the Parking Lot Alternative, measures would be taken to help reduce or eliminate potential impacts to air quality, odor, and climate change during and after construction. The measures would include, but are not limited to, those listed below:

- Follow best management practices for controlling fugitive dust.
- Minimize odors by incorporating odor control and automated flushing systems into the design of the CSO storage tank, minimizing the time combined sewage is stored in the tank, maintaining the air space in the tank at slightly negative pressure, providing odor control, and scheduling maintenance of the odor control system during cold temperatures and periods of low flow.
- Encourage practices that reduce greenhouse gas emissions such as limiting idling of equipment, encouraging construction workers to carpool, and buying products manufactured/produced locally.

10.6 Would the proposed project have any significant unavoidable adverse impacts associated with air quality, odor, or climate change?

No significant unavoidable adverse impacts associated with air quality, odor, or climate change are anticipated during or after construction.

11 Geology

11.1 What are the existing geologic conditions in the project area?

Seattle is located in the central portion of a geologic area called the "Puget Lowland," a north/south-orientated, elongated, topographic depression that is bordered by the Cascade Mountains to the east and the Olympic Mountains to the west. The project area is located in highly-weathered-to-fresh, low-strength, sedimentary sandstone, and mudstone containing marine fossils and shells. Bedrock outcrops occur from the middle of Seward Park and extend southward (Shannon & Wilson, Inc. 2011).

There are no steep slopes within the limits of construction. However, the City's GIS information regarding environmental critical areas shows steep slope areas approximately 75 feet to the west of the CSO storage tank site for the Tennis Courts Alternative and approximately 150 feet to the north of the CSO storage tank site for the Parking Lot Alternative (DPD 2011).

The project area is within the Seattle Fault zone, which extends for approximately 7 to 8 miles from Beer Sheva Park on the south to Leschi Park on the north along the western shoreline of Lake Washington. The fault extends from the Olympic Mountains on the west to the foothills of the Cascades on the east. Preliminary estimates of seismic event recurrence rates for the Seattle Fault are on the order of 3,000 to 5,000 years. Earthquake magnitudes of up to 7.7 have been estimated for this fault (Shannon & Wilson, Inc. 2011).

Geotechnical borings conducted in Seward Park identified 0.5 to 10 feet of medium-stiff clay fill overlaying completely-to-highly-weathered sedimentary bedrock (sandstone and siltstone), becoming slightly-weathered-to-fresh with increasing depth. Based on the geotechnical findings, the CSO storage tank at either alternative site would be constructed in bedrock, which likely would be encountered from 3 to 12 feet below the ground surface for the Tennis Courts Alternative and from 2 to 10 feet below the ground surface for the Parking Lot Alternative.

Geotechnical borings in the UPARR replacement area found very-soft-to-soft silt and clay soil (lake deposit) between 4 and 7 feet in depth underlain by loose-to-very-dense silty sand and stiff-to-hard silt, sandy silt, and sandy clay to depths of 32 to 37 feet. Sandstone or siltstone was encountered below the soil deposits and extended to the bottom of the borings approximately 61 feet below ground surface.

The nearshore slope along the Seward Park project area is approximately 2.2 percent measured as the average of the two locations being considered for shoreline treatment work.

Wind waves were used in the project design criteria for the shoreline treatment because wind-induced waves are larger than vessel-induced waves at the Seward Park shoreline. The greatest percentage of wind-induced waves comes from the south but the measured wind speed rarely exceeds 15 miles per hour. The conceptual 100-year wave height is 2.8 feet.

Bathymetric and wave data were not collected for the UPARR replacement area since the upland landscaping enhancements would not include in-water work.

11.2 How would the proposed project affect geology?

11.2.1 Direct Impacts – Tennis Courts and Parking Lot Alternatives

The impacts would be the same for both alternatives, unless noted otherwise.

11.2.1.1 During Construction

No significant impacts to geology in Seward Park or the UPARR replacement area are anticipated during construction.

Grading and excavation would disturb native, in situ soil and bedrock conditions during construction. Approximately 44,400 cubic yards of soil and rock would be excavated for construction of the Seward Park project components and approximately 3,700 cubic yards of imported fill would be used. Imported fill will be required due to the general unsuitability of the site soils for structural fill. Structural fill will be used to backfill around the tank structure wall and in other locations. For the UPARR replacement area, approximately 6 cubic yards of soil would be cleared in preparation for the new plantings and approximately 6 cubic yards of compost and 3 cubic yards of bark mulch would be added. The excavated soil would be disposed of at an appropriate, permitted, offsite disposal facility.

Erosion and surface water runoff could increase because of grading and excavation, which would remove vegetative cover or pavement and expose soil. Chapter 9 Water Resources discusses the potential impacts of erosion and surface water runoff on water quality in Lake Washington. The proposed project would include erosion and sediment controls and other best management practices to avoid uncontrolled discharges that could affect water quality.

Hazardous materials and waste such as oil, grease, and fuels used for construction equipment potentially could be spilled or released causing localized contamination of soil. The potential for these contaminants to impact the soil would depend on the nature and quantity of the spill, the time between the spill and the clean-up, and the geology of the area. The proposed project would include spill control and prevention and other best management practices to avoid uncontrolled discharges that would affect soil.

Vibration and settlement could occur from shoring installation, excavation, equipment traffic, and other general construction-related vibrations. Slope instability could occur due to excavation near existing slopes. Ground settlement also could potentially occur from groundwater de-watering during construction. The potential for observed or measured vibration (and any associated effects, such as settlement) depends on several factors, including the subsurface

conditions and the distance from the source to the receiver. It is likely that the potential for vibration and effects on the nearby residences would be higher for the Tennis Courts Alternative than for the Parking Lot Alternative. Similarly, it is likely that the potential for vibration and effects on the nearby park facilities would be higher for the Parking Lot Alternative than for the Tennis Courts Alternative.

SPU does not anticipate that vibration, blasting, or other construction-related activities would damage nearby homes or sewers because construction best management practices would be implemented. However, pre and post-construction surveys of adjacent homes and private sewer lines will be conducted and any construction-related damage would be repaired. Additionally, monitoring of vibration will be performed to indicate whether the construction procedures used are generating surface and subsurface ground movements, and if vibration intensities are within specified limits.

Shoring techniques would be used that do not produce significant vibration and the design would reduce the potential for impact to adjacent structures. The likely shoring installation methods include secant piles and grouting. Both of these techniques are generally considered low vibration-producing methods and generally produce much less vibration and noise than other shoring installation methods, such as impact or vibratory pile driving.

Rock excavation for the project could be accomplished using drilling and controlled blasting methods or mechanical excavation using bulldozers or using hydraulic impact hammers mounted on tracked excavators. Each method has advantages and disadvantages, but in each case, potential construction related impacts (e.g. ground-borne vibration, noise, dust, etc.) can be mitigated by establishing and adhering to standard industry threshold and limiting criteria for noise, vibration and dust.

Threshold levels of acceptable vibration, partly based on structure or utility type and condition, would be set and specified in the contract documents. Monitoring of the associated vibrations and effects will be performed. This would indicate whether or not the construction procedures used are generating surface and subsurface ground movements, and vibration intensities within specified limits. This monitoring will include a pre-construction survey of adjacent buildings, structures, and utilities; installation of seismographs to measure vibration intensity and frequency; and installation of other geotechnical instrumentation to monitor for any associated effects.

Both alternative sites are near the base of slopes. Both slopes are approximately 20-25 feet high and are about 2H:1V (horizontal to vertical). The toes of the slopes are 40 feet or farther from the proposed excavations. Additional geotechnical information will be gathered at the selected site to aid in assessing impacts of the excavation on the stability of the existing slope. If the geotechnical conditions and analyses indicate a likelihood of slope instability due to the proposed construction, such instability would be mitigated by implementing an appropriate design, using appropriate construction practices, and monitoring the slope and other affected facilities during construction. The current excavation support system concept is a secant pile wall. This wall system is installed into the ground prior to any excavation occurring – there will therefore not be an instance of an unsupported excavation near the toe of the slope.

Additionally, effects of the tank excavation on the slope's stability (if any) could be readily mitigated by adding additional reinforcing in the piles, deepening the piles, or increasing the pile thickness.

Dewatering-induced settlement generally occurs where water is removed from previously-saturated soils, reducing pressure in the soil's pores, and thereby increasing the effective stress in the soil. Much of the excavation for either alternative will be in bedrock. Dewatering of the excavation may be required, which would involve temporarily removing water from the fractures and joints in the rock during construction. While it is possible that this may cause some settlement, it is likely to be smaller than settlement associated with dewatering in soil. Because the excavation will likely be supported by secant piling, dewatering would likely be limited to removing water from the interior of the excavation (rather than drawing the water down over a large area). This would reduce the settlement potential associated with the dewatering.

11.2.1.2 After Construction

No significant impacts to geology and soils are expected in Seward Park or the UPARR replacement area after construction. No direct impacts associated with geology would occur after construction of the project is complete.

11.2.2 Indirect Impacts – Tennis Courts and Parking Lot Alternatives

No indirect impacts were identified for the Tennis Courts Alternative or the Parking Lot Alternative.

11.2.3 Direct and Indirect Impacts – No Action Alternative

Under the No Action Alternative, the CSO storage tank would not be built and the shoreline treatment and transfer of grant restrictions would not be implemented. However, the existing CSO outfall is expected to be replaced between 2015 and 2020 as part of the SPU Outfall Rehabilitation Program. The direct and indirect impacts of the CSO outfall replacement would be addressed by a separate SEPA environmental review process that would be conducted prior to the CSO outfall replacement.

11.3 What measures would reduce or eliminate potential impacts associated with geology?

For both the Tennis Courts Alternative and the Parking Lot Alternative, SPU would take measures to help reduce or eliminate potential impacts associated with geology during and after construction. The measures would include, but are not limited to, those listed below:

- Use construction methods that do not produce significant vibration, such as secant pile walls (vertical elements drilled into place) or drilled/grouted shoring systems, to not impact adjacent structures.
- Specify threshold vibration levels in the contract documents.
- Perform pre and post-construction surveys of nearby structures and utilities.

- Implement a monitoring program to measure vibration levels and any movement of nearby existing structures.
- If blasting is used for excavation, specify a threshold value for air overpressure based on acceptable levels; control the powder factor, the charge weight per delay, and delay pattern; and provide proper stemming, blasting mats, and proper relief for each blast.
- Dispose of excavated soil at an appropriate, permitted, offsite disposal facility.

11.4 Would the proposed project have any significant unavoidable adverse impacts associated with geology?

No significant unavoidable adverse impacts associated with geology are anticipated during or after construction.

This page was left intentionally blank.

12 Land and Shoreline Uses

12.1 What are the designated land and shoreline uses in the project area?

12.1.1 Designated Land Use

The project area is zoned as Residential Single Family (SF) with minimum lot sizes of 7,200 and 9,600 square feet (see Figure 12-1). Land use in SF-zoned areas is regulated by the Seattle Municipal Code (SMC) Chapter 23.44, Residential Single-Family (City of Seattle 2011). The current comprehensive plan land use designations at the project location are City-Owned Open Space and Single Family Residential (DPD 2005).

12.1.2 Designated Shoreline Use

Project facilities would be located in shoreline areas designated as Conservancy Recreation and Conservancy Preservation in Seward Park and Conservancy Management in the UPARR replacement area (see Figure 12-2). The purpose of these designations, according to the City of Seattle Shoreline Master Program, is as follows:

- **Conservancy Recreation** is to provide public access and recreational use of shorelines while protecting ecological functions.
- **Conservancy Preservation** is to preserve, protect, restore, or enhance certain areas that are particularly biologically or geologically fragile and to encourage the enjoyment of those areas by the public.
- **Conservancy Management** is to conserve and manage areas for public purposes, recreational activities, and fish migration routes.

12.2 How would the proposed project affect land and shoreline uses?

12.2.1 Direct Impacts - Tennis Courts and Parking Lot Alternatives

The impacts would be the same for both alternatives, unless noted otherwise.

12.2.1.1 During Construction

No significant impacts to land and shoreline uses are expected in Seward Park or the UPARR replacement area during construction.

The shoreline treatment in Seward Park and the transfer of UPARR grant protections and upland landscaping enhancements in Lake Washington Boulevard Park are permitted outright. The CSO storage tank and the CSO outfall replacement in Seward Park would need to be reviewed and approved under a Council Conditional Use Permit.

The CSO outfall replacement, shoreline treatment, and UPARR replacement area are consistent with the current Shoreline Master Program. The CSO storage tank is inconsistent with the current Shoreline Master Program because CSO facilities (i.e., utility service uses) are prohibited within a Conservancy Recreation shoreline environment. However, DPD has proposed amendments to the Shoreline Master Program that would allow CSO facilities within Conservancy Recreation shoreline environments. If the amendments are approved, the CSO facilities would be permitted.

12.2.1.2 After Construction

No significant impacts to land and shoreline uses are expected in Seward Park or the UPARR replacement area after construction. The presence of the project facilities would result in a dedicated use of the sub-surface area and would restrict certain future uses in the surface area. For example, the presence of the CSO storage tank would complicate siting certain structures, or developing a treed area, in that same location.

The transfer of the UPARR grant protections to the replacement area would restrict potential future uses of that area. This impact is considered minor because the affected area is a small portion of the overall land in Seward Park and the UPARR replacement area and is consistent with current and future plans for those areas.

12.2.2 Indirect Impacts - Tennis Courts and Parking Lot Alternatives

No indirect impacts were identified for the Tennis Courts Alternative or the Parking Lot Alternative.

12.2.3 Direct and Indirect Impacts – No Action Alternative

Under the No Action Alternative, the CSO storage tank would not be built and the shoreline treatment and transfer of grant restrictions would not be implemented. However, the existing CSO outfall is expected to be replaced between 2015 and 2020 as part of the SPU Outfall Rehabilitation Program. The direct and indirect impacts of the CSO outfall replacement would be addressed by a separate SEPA environmental review process that would be conducted prior to the CSO outfall replacement.

12.3 What measures would reduce or eliminate potential impacts on land and shoreline uses?

For both the Tennis Courts Alternative and the Parking Lot Alternative, SPU would take measures to help reduce or eliminate potential impacts on land and shoreline uses during and after construction. The measures would include meeting regulatory requirements, implementing standard best management practices, and restoring the project to pre-construction uses after construction.

D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EIS\map_AP_DEIS_Fig12-01_Zoning.mxd 12/5/2012

Legend

- Commercial (NC1-30)
- Residential (SF 5000)
- Residential (SF 7200)
- Residential (SF 9600)
- Potential Project Areas

0 250 500 1,000 Feet

N

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

LAND USE ZONES

JANUARY 2013 | **FIGURE 12-1**

This page was left intentionally blank.

D:\GISDATA\projects\wash\SPU Hen-Gen\map docs\mxd\2012 Final EIS\map AP DEIS Fig12-02 ShorelineZoning.mxd 11/5/2012

Legend

- Conservancy Management
- Conservancy Preservation
- Conservancy Recreation
- Potential Project Areas

0 250 500 1,000 Feet

N

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

SHORELINE ENVIRONMENT DESIGNATIONS

JANUARY 2013 | **FIGURE 12-2**

This page was left intentionally blank.

12.4 Is the proposed project consistent with plans and zoning regulations?

12.4.1 Consistency With Plans

City of Seattle Comprehensive Plan

The City of Seattle Comprehensive Plan (DPD 2005) provides policies that guide the adoption of development regulations and inform policy decisions regarding development within the City. The most salient goals and policies relevant to the proposed project are listed below, along with a summary of the subject matter:

Utilities

- UG1 - Provide reliable service with environmental stewardship and public health protection
- UG2 - Maintain the service reliability of the City's utility infrastructure
- U15 - Prioritize CSO projects according to frequency, volume, and location sensitivity
- U18 - Work with neighborhood and community representatives in siting facilities
- U20 - Incorporate open space in the siting and design of facilities

Environment

- EG1 - Protect and improve air, land, and water quality for people and wildlife
- EG4 - Recognize and enhance the value of aquatic areas
- EG5 - Pursue the long-term health of Seattle's receiving waters
- EG6 - Minimize the number and extent of CSO events
- E4 - Protect and retain trees that enhance historical, cultural, environmental and aesthetic character
- E23 - Achieve no net loss of tree canopy

Land Use

- LUG45 - Preserve and enhance views of the shoreline and water
- LUG55 - Protect special shoreline areas
- LUG58 - Upgrade and/or beautify the public shoreline
- LU12 - Limit non-residential uses in residential zones
- LU18 - Locate parking facilities to avoid traffic through residential streets
- LU38 - Use screening and landscaping to minimize impacts
- LU39 - Preserve and enhance the physical and aesthetic character and environment by protecting trees
- LU47 - Limit light and glare on surrounding uses
- LU249 - Minimize impacts of dredging and disposal of dredge materials

Transportation

- TG7 - Protect neighborhood streets from through traffic
- T8 - Reduce and help prevent road damage from heavy vehicles
- T17 - Reduce the number of vehicle trips and miles driven

Cultural Resources

- CRG7 - Preserve the integrity of cultural resources

The proposed project is consistent with many of the individual Comprehensive Plan goals and policies, including those that call for improving water quality and minimizing CSO events. The proposed project is inconsistent with some of the individual Comprehensive Plan goals and policies, including those that call for preserving the solitude of residential neighborhoods and preserving trees.

As noted in the Comprehensive Plan, "Some policies may appear to conflict, particularly in the context of a specific fact situation or viewed from the different perspectives of persons whose interests may conflict on a given issue. A classic example is the oft-referenced conflict between policies calling for preservation of the environment and policies that promote economic development. Because Plan policies do not exist in isolation, and must be viewed in the context of all potentially relevant policies, it is largely in the application of those policies that the interests which they embody are reconciled and balanced by the legislative and executive branches of City government." (DPD 2005).

Based on the context of all potentially relevant Comprehensive Plan goals and policies and the application of their underlying interest, the proposed project is consistent with the overall Comprehensive Plan, while being inconsistent with some of the individual goals and policies considered in isolation.

Seward Park Vegetation Management Plan

The Seward Park Vegetation Management Plan provides guidelines for community-based stewardship activities, capital improvement projects, and maintenance. The plan primarily focuses on the protection and enhancement of the vegetation resources of the park. Goals of the plan include preserving and enhancing the forest health, improving habitat for native wildlife, and managing vegetation consistent with habitat, park landscape heritage and established uses.

The proposed locations for the underground storage facilities would maintain the existing park uses and do not preclude any future uses or projects identified within the Seward Park Vegetation Management Plan. Existing shoreline vistas, controlled access to the water, and habitat enhancement are provided per the plan's goals. The proposed alternative locations also provide opportunities to enhance the shoreline and upland native restoration planting. Removal of existing trees is not specifically addressed in the plan, but would generally not be consistent with the plan. The proposed project restoration and enhancement measures would be consistent with the plan.

Seward Park Comprehensive Trail Plan

The Seward Park Comprehensive Trail Plan provides a guideline for trail-related development and maintenance for Seward Park. The plan repeats the goals of the Seward Park Vegetation Management Plan, including preserving the park's exceptional native forest, and providing visitors with an inspiring experience of nature and diverse recreational opportunities focused near the lakeshore. The plan's goals include preserving the primitive feeling of existing trails, improving wildlife habitat, and closing and removing opportunities for social trails. The plan primarily addresses trail stewardship within the interior of the park and does not specifically address improvements adjacent to either the Parking Lot or Tennis Court Alternatives.

The proposed locations for the underground storage facilities would maintain the existing park uses and do not preclude future uses or projects identified within the Seward Park Comprehensive Trail Plan, though parking for trail users would be affected during construction. Proposed upland understory planting at either alternative site would align with goals to limit opportunities for social trails. Native planting for either alternative site would support habitat development.

Lake Washington Boulevard Vegetation Management Plan

The Lake Washington Boulevard Vegetation Management Plan provides a comprehensive set of guidelines for the development of future improvement projects, and maintenance and operational standards for trees, shrubs and lawn along the Boulevard. Goals of the plan include preserving the identity of the corridor, removing of invasive vegetation, enhancing views, promoting native character where appropriate, and enhancing wildlife habitat.

The proposed project component in the UPARR replacement area is consistent with the Lake Washington Boulevard Vegetation Management Plan by removing invasive vegetation and providing low growing drifts of native planting adjacent to the lake, while maintaining and framing existing views. The proposed project component in the UPARR replacement area does not preclude any other projects identified in the Lake Washington Boulevard Vegetation Management Plan.

Seattle Parks and Recreation 2011 Development Plan

The Seattle Parks and Recreation 2011 Development Plan provides specific acquisition and development efforts planned for the city. It includes goals and policies related to park acquisition and development, an analysis that identifies areas in the city for acquisition and development, and contains Seattle's adopted 2011-2016 Capital improvement Program (CIP) for parks and recreational facilities. The highest priorities identified in the plan are the maintenance of existing facilities, and providing more trails, multi-purpose sports fields, parkland along the waterfront, and urban gardens. Specific goals that relate to this project include maintaining existing tennis courts, and restoring urban green spaces for habitat.

The proposed locations for the underground storage facilities and the project component in the UPARR replacement area would maintain the existing park uses and do not preclude any future uses or projects identified within the Seattle Parks and Recreation 2011 Development Plan.

12.4.2 Consistency With Zoning Regulations

The park and landscaping components of the project are permitted outright by the City's single-family zoning regulations, SMC 23.44.006. The storage facility and related infrastructure are also permitted by the single family zoning regulations, but a Council conditional use permit is required per SMC 23.44.036. The park and landscaping components are also permitted by the overlay zoning regulations contained in the City's Shoreline regulations. However as described above, the storage facility is inconsistent with the current Shoreline Master Program because CSO facilities (i.e., "utility service uses") are prohibited within a Conservancy Recreation shoreline environment. However, DPD has proposed amendments to the Shoreline Master Program that would allow CSO facilities within Conservancy Recreation shoreline environments. If the amendments are approved, the CSO facility would be permitted.

12.5 Would the proposed project have any significant unavoidable adverse impacts on land and shoreline uses?

No significant unavoidable adverse impacts on land and shoreline uses are anticipated during or after construction.

13 Noise and Environmental Hazards

13.1 What are the existing conditions for noise and environmental hazards in the project area?

Noise

The allowable construction noise limit, as measured at the property line, for the project area is 80 A-weighted decibels (dBA) per SMC 25.08.425. This limit consists of a base limit of 55 dBA plus a 25 dBA exceedance for the anticipated heavy construction equipment such as bulldozers, excavators, and cranes. Additionally, impulse type equipment such as pile drivers and jackhammers are allowed to exceed the 80 dBA limit for short periods.

HDR conducted noise monitoring at nine locations near the Tennis Courts Alternative and the Parking Lot Alternative sites (see Figure 13-1) to characterize existing noise conditions. The existing noise levels ranged from 37 to 60 dBA. Existing noise levels in Seward Park are low because of low traffic volumes in the park and the absence of other major noise sources. Measured noise levels at residential locations outside the park are higher due to traffic on Lake Washington Boulevard South, Seward Park Avenue South, and Lake Shore Drive South. Measured noise levels at all locations in the vicinity are typical of quiet, urban neighborhoods.

Environmental Hazards

Nine recognized environmental conditions (RECs) were documented within one mile of the project area based on historical documents, regulatory files, and site reconnaissance (HDR 2012e). An REC is defined by the American Society for Testing and Materials Practice E 1527-05 as: "the presence or likely presence of any hazardous substances or petroleum products on a project site under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the project site or into the ground, groundwater, or surface water of the project site."

One REC (Site I) is located in the project area. Two RECs (Sites A and B) are located outside of the project area, but within 500 feet. The other six RECs are located more than a 1/2-mile away. Information on Sites I, A, and B is provided below and the locations are shown on Figure 13-2.

- **Site I - Basin 44 CSO Outfall Pipe**: The sediment in the vicinity of the existing CSO outfall pipe may contain petroleum, metals, semi-volatile and volatile organic compounds, and other contaminants, based on the age of the pipe, the known development in the area, potential spills from commercial activities, and 80 years of street runoff. If disturbed, sediments in and along the pipe and at its outfall may pose a risk to human health and the environment.

- **Site A – Seward Park Arts Annex, 5900 Lake Washington Boulevard South**: A 400-gallon, underground heating oil storage tank was decommissioned and removed from the Seward Park Arts Annex in December 1995. Upon removal, large rust holes and indications that the underground storage tank had leaked were observed. Soil was excavated by hand and contaminated soil was left in place to be addressed if the remaining structures were removed or renovated. Soil at the bottom of the excavation exceeded the Ecology Method A cleanup levels for petroleum hydrocarbons. The excavation area was lined with 10-millimeter plastic before being backfilled with pea gravel (Kleen 1995).
- **Site B – Seward Park Environmental/Nature Center Building, 5898 Lake Washington Boulevard South:** A release was reported from a leaking aboveground heating oil tank at the Seward Park Environmental/Nature Center building. Approximately 4.7 tons of petroleum-contaminated soil was excavated from the site in December 2006. Excavations were limited to the bottom of the building footing. Soil samples taken during excavation indicated high levels of heating oil remaining below grade. Additional measures were taken to remediate the remaining soil contamination, but the status is not known.

13.2 How would the project affect noise and environmental hazards?

13.2.1 Direct Impacts – Tennis Courts and Parking Lot Alternatives

The impacts would be the same for both alternatives, unless noted otherwise.

13.2.1.1 During Construction

No significant impacts related to noise or environmental hazards are expected to occur in Seward Park or the UPARR replacement area during construction.

Noise

Noise levels would increase due to the operation of heavy construction equipment. Depending on the nature of the construction activity, the noise could vary from intermittent to continuous. Construction noise was modeled at nearby residences and park facilities (see Figure 13-1) using the Federal Highway Administration's Roadway Construction Noise Model (FHWA 2006) (HDR 2012c). Table 13-1 shows the modeled noise levels. Noise levels at the nearby residences would be higher under the Tennis Courts Alternative than under the Parking Lot Alternative. Noise levels at the nearby park facilities would be lower under the Tennis Courts Alternative than under the Parking Lot Alternative. While park users and nearby residents likely would notice a moderate increase in noise levels, the construction noise is not anticipated to exceed the allowable noise limit.

D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012 Final EIS\map_AP_DEIS_Fig13-01_noise_mon_locations.mxd 12/5/2012

Legend

- Monitoring Location
- Modeling Location
- Underground Storage Tank

0 100 200 400 Feet

N

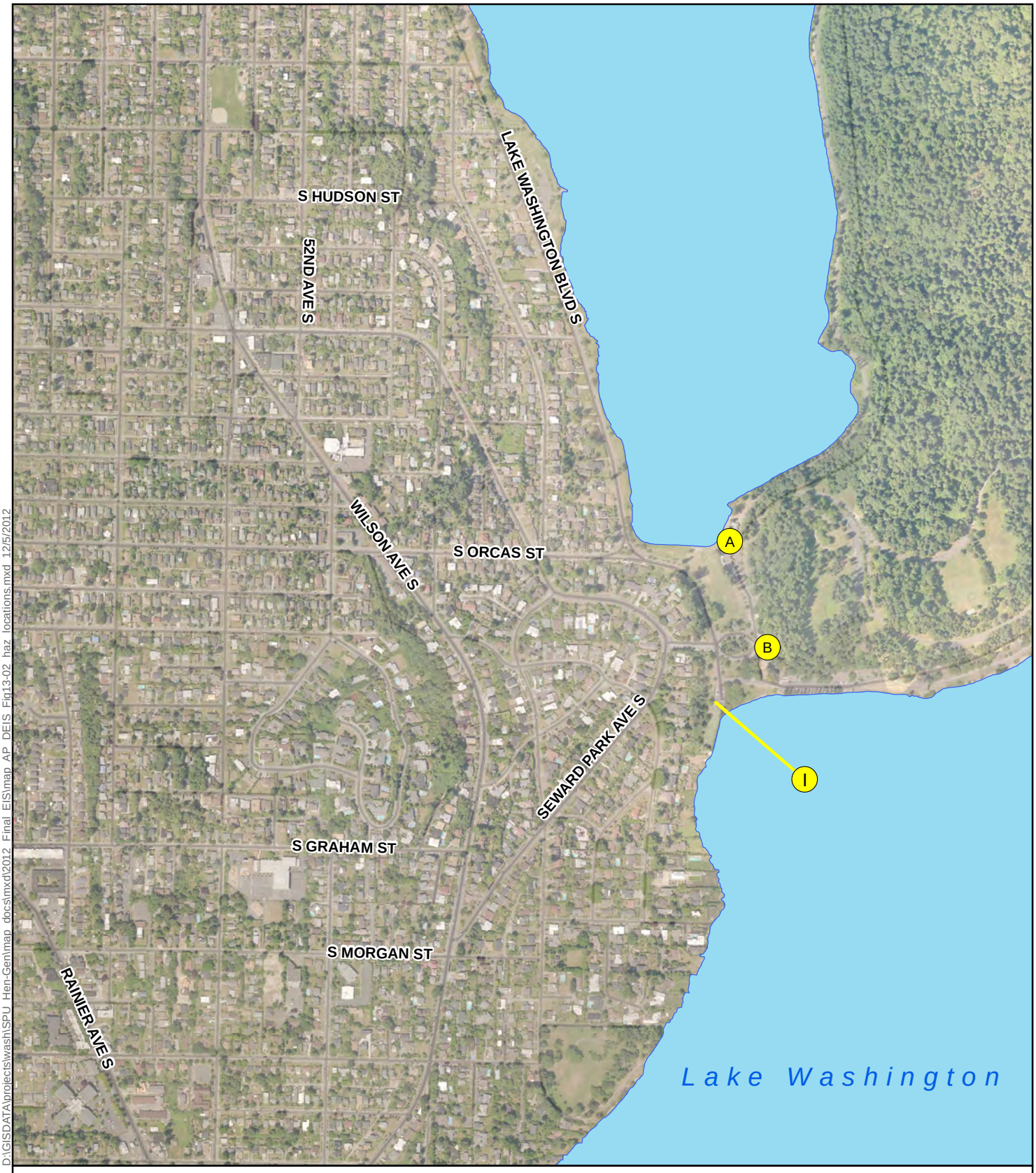
Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

NOISE MONITORING LOCATIONS

JANUARY 2013 | **FIGURE 13-1**

This page was left intentionally blank.



D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EIS\map_AP_DEIS_Fig13-02_haz_locations.mxd 12/5/2012

Legend

Hazardous Materials Site

0 300 600 1,200 Feet

N

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

LOW TO MODERATE RISK HAZARDOUS MATERIALS SITES

JANUARY 2013

FIGURE 13-2

This page was left intentionally blank.

Table 13-1. Modeled Construction Noise Levels

Receptors (Residences and Park Locations)	Tennis Courts Alternative		Parking Lot Alternative	
	Distance to Receptor (Feet)	Leq[1] (dBA)	Distance to Receptor (Feet)	Leq[1] (dBA)
R1 - Residence	680	65	860	63
R2 - Residence	430	69	795	64
R3 - Residence	430	69	775	64
R4 - Residence	320	72	820	64
R5 - Residence	320	72	795	64
R6 - Residence	180	77	820	64
R7 - Residence	225	75	910	63
R8 - Audubon Center	620	66	390	70
R9 - Playground	540	67	360	71
R10 - Picnic Shelter	580	67	210	76

[1]Leq = Equivalent continuous noise level

Environmental Hazards

Hazardous materials could be released into the environment from three RECs identified within 500 feet of the project area. The risk of contributing to the presence of contaminated soil or groundwater in the project area is low to moderate, as follows:

- **Site I Basin 44 CSO Outfall Pipe** – Due to the location within the project area, this site is ranked as a moderate risk. (See Section 13.3 for information related to minimizing this risk.)

- **Site A Seward Park Arts Annex** – The geography of this site suggests that any contamination would flow north, rather than south toward the project area. Since the Park Art Annex is located north of the project site, this site is considered low risk.

- **Site B Seward Park Environmental/Nature Center Building** – No records are available to report final remediation results. The geography of this site suggests that contamination would flow south toward the project area. However, because this site is only a few hundred feet away from the project area, this site is considered low to moderate risk.

13.2.1.2 After Construction

No significant impacts related to noise or environmental hazards are expected to occur in Seward Park or the UPARR replacement area after construction.

Noise

Noise would occur from operation of facilities and from maintenance activities. Noise generating equipment, such as fans from the odor control system, would be located below ground and maintenance would be infrequent and occur only during daytime hours, except in emergency situations. Additionally, a study that modeled the operational noise at nearby residences and park facilities concluded that the noise levels would be expected to comply with the maximum allowable noise limits (HDR 2012d).

Environmental Hazards

SPU anticipates no direct impacts associated with environmental hazards would occur after construction of the project is complete.

13.2.2 Indirect Impacts – Tennis Courts and Parking Lot Alternatives

No indirect impacts were identified for the Tennis Courts Alternative or the Parking Lot Alternative.

13.2.3 Direct and Indirect Impacts – No Action Alternative

Under the No Action Alternative, the CSO storage tank would not be built and the shoreline treatment and transfer of grant restrictions would not be implemented. However, the existing CSO outfall is expected to be replaced between 2015 and 2020 as part of the SPU Outfall Rehabilitation Program. The direct and indirect impacts of the CSO outfall replacement would be addressed by a separate SEPA environmental review process that would be conducted prior to the CSO outfall replacement.

13.3 What measures would reduce or eliminate potential impacts due to noise and environmental hazards?

For both the Tennis Courts Alternative and the Parking Lot Alternative, SPU would take measures to help reduce or eliminate potential impacts to noise and environmental hazards during and after construction. The measures would include, but are not limited to, those listed below:

- Encourage noise-reducing measures, such as using sound-control devices on equipment, prohibiting equipment with unmuffled exhaust, minimizing idling time of equipment and vehicles, and installing acoustic barriers around stationary sources of construction noise.
- Conduct on-site noise monitoring to ensure compliance with SMC provisions, if necessary.

- Perform sediment characterization sampling and analysis to determine proper disposal near the existing CSO outfall for the potential contaminants that may include the following parameters: petroleum hydrocarbons, volatile organic compounds, semi-volatile organic compounds, and priority pollutant metals. If contaminants are found, limit their migration by best management practices, such as use of underwater silt curtains and sheet piles, and disposing of sediments in an approved offsite facility.
- Develop and implement plans for pollution prevention; to control and manage spills; and for sediment handling, testing, and disposal.

13.4 Would the project have any significant unavoidable adverse impacts on noise and environmental hazards?

No significant unavoidable adverse impacts on noise and environmental hazards are anticipated during or after construction.

This page was left intentionally blank.

14 Energy and Natural Resources

14.1 How would the proposed project affect energy and natural resources?

14.1.1 Direct Impacts - Tennis Courts and Parking Lot Alternatives

The impacts would be the same for both alternatives, unless noted otherwise.

14.1.1.1 During Construction

No significant impacts related to energy or natural resources are expected to occur in Seward Park or the UPARR replacement area during construction.

Energy

Fuel would be consumed for transporting equipment and materials, construction equipment, and contractor commuting. The anticipated fuel consumption is approximately 230,000 gallons, as documented in Appendix D. This is equivalent to the annual consumption of approximately 400 light duty vehicles (passenger cars and light trucks), based on 2009 data from the US Bureau of Transportation Statistics (USDOT 2011).

Electrical energy would be used to power tools and equipment, as well as to provide site lighting during regular work hours at darker times of the year, typically November through March. The estimated amount of electricity is approximately 85,000 kilowatt hours (kWh), as documented in Appendix D. This is equivalent to the annual usage of approximately four homes, based on 2005 data from the US Energy Information Administration (US EIA 2010).

These energy impacts represent a small portion of the overall regional demand.

Natural Resources

Natural resources would be used for construction materials. Petroleum would be used in manufacturing polyvinyl chloride pipe, high-density polyethylene pipe, and asphalt. Rock, gravel, and sand would be used in concrete and as bedding material and backfill. Metals such as steel, aluminum, iron, copper, and brass, would be used for pipes, hatches, covers, pumps, valves, rebar, meters, and fittings. Water would be used to wash construction trucks and equipment, and control dust during construction. Plants installed as part of landscape restoration would come from commercial nurseries and, therefore, would not impact wild stocks. The quantities represent a small portion of the total regional resources available.

14.1.1.2 After Construction

No significant impacts related to energy or natural resources are expected to occur in Seward Park or the UPARR replacement area after construction.

Energy

Fuel would be consumed during operations for inspecting the storage tank and ancillary equipment, replacing odor control media, operating pumps and valves, and replacing ancillary equipment. SPU maintenance staff would typically visit the CSO storage tank quarterly to conduct inspections and maintenance, with most visits occurring during the wet weather season from November through March. Typical equipment used during these visits would include Vactor™ trucks and field service vans. In the first year or so of use, SPU staff may elect to visit the site periodically during or after a CSO event, which would require one vehicle. A watering truck would be used in the summer to water new plants during their establishment period, which is a minimum of three years. The anticipated annual fuel consumption for these activities would be approximately 38 gallons (see Appendix D), which would be equivalent to the consumption of less than one light duty vehicle.

Electricity would be used to direct CSOs to the tank and to power equipment (e.g., fans and pumps) that drains, cleans, and ventilates the CSO storage tank. The anticipated annual electricity consumed would be approximately 174,000 kWh (see Appendix D), which would be equivalent to the annual electricity use of approximately eight homes.

King County's West Point Treatment Plant would receive additional sewage flows that previously were discharged to Lake Washington. The effort to convey and treat these additional flows is expected to increase energy consumption at pump stations and the treatment plant by less than one percent.

The project energy requirements represent a small portion of the overall regional demand.

Natural Resources

Natural resources, namely petroleum and metals, would be used occasionally after construction as equipment reaches its useful life and requires replacement. The quantities represent a small portion of the total regional resources available.

14.1.2 Indirect Impacts – Tennis Courts and Parking Lot Alternatives

No indirect impacts were identified for the Tennis Courts Alternative or the Parking Lot Alternative.

14.1.3 Direct and Indirect Impacts – No Action Alternative

Under the No Action Alternative, the CSO storage tank would not be built and the shoreline treatment and transfer of grant restrictions would not be implemented. However, the existing CSO outfall is expected to be replaced between 2015 and 2020 as part of the SPU Outfall Rehabilitation Program. The direct and indirect impacts of the CSO outfall replacement would be addressed by a separate SEPA environmental review process that would be conducted prior to the CSO outfall replacement.

14.2 What measures would reduce or eliminate potential impacts to energy and natural resources?

For both the Tennis Courts Alternative and the Parking Lot Alternative, SPU would take measures to help reduce or eliminate potential impacts to energy and natural resources during and after construction. The measures would include, but are not limited to, those listed below:

- Encourage efficient energy use, such as limiting idling equipment, and encouraging construction workers to carpool.
- Acquire natural resources, such as backfill material and concrete mix, from local stockpiles to reduce the energy consumption from transportation of those materials.
- Size equipment used within the facility to maximize energy efficiency.

14.3 Would the proposed project have any significant unavoidable adverse impacts on energy or natural resources?

No significant unavoidable adverse impacts on energy or natural resources are anticipated during or after construction.

This page was left intentionally blank.

15 Public Services and Utilities

15.1 What public services and utilities are in the project vicinity?

15.1.1 Public Services

Law Enforcement: Police protection services are provided by the Seattle Police Department, with assistance from the King County Sheriff's Department.

Fire and Life Safety: Fire and life safety services are provided by the Seattle Fire Department.

Schools: The project area is served by the Seattle School District and private schools. There are six schools within two miles of the project site.

15.1.2 Utilities

Water: SPU provides water in the project vicinity. No water lines or water services are located within the construction limits; however, water lines are located next to the entrance of Seward Park and near the UPARR replacement area.

Sewer: SPU and Seattle Parks provide sewer services in the project vicinity. SPU owns and operates sewer infrastructure in Seward Park related to Basin 44. Seattle Parks owns and operates a small sanitary sewer system, including a small pump station that handles sewage generated in Seward Park. The Seattle Parks sewer system discharges into SPU's combined sewer system. In the UPARR replacement area, no sewer services are within the construction limits; however, sewer pipelines are located nearby in Lake Washington Boulevard South.

Drainage: Stormwater from the parking lots and roadways in Seward Park is managed by Seattle Parks and is discharged into Lake Washington without treatment. SPU manages stormwater in the rest of Basin 44 and has a stormwater pipe that runs between Parking Lot 1 and Parking Lot 2 and ends as an outfall into Lake Washington. No impervious surface exists in the UPARR replacement area; however, stormwater from the adjacent parking lot is managed by Seattle Parks and is discharged into Lake Washington without treatment.

Solid Waste: The City contracts with Waste Management, Inc., and CleanScapes for citywide solid waste and recycling collection and compostable collection services, respectively, including the project area.

Electrical Power: Seattle City Light provides electrical service in the project vicinity. For both Seward Park and the UPARR replacement area, there are no power lines within the construction limits; however, there is power nearby along Lake Washington Boulevard South and into Seward Park.

Natural Gas: Puget Sound Energy provides natural gas service in the project vicinity. For both Seward Park and the UPARR replacement area, there are no gas lines within the construction limits; however, there is gas nearby.

Communications: CenturyLink provides the project vicinity with traditional land-line telephone services, Comcast provides cable TV services, and various telecommunications companies provide cellular telephone services.

15.2 How would the proposed project affect public services and utilities?

15.2.1 Direct Impacts – Tennis Courts and Parking Lot Alternatives

The impacts would be the same for both alternatives, unless noted otherwise.

15.2.1.1 During Construction

No significant impacts to public services and utilities are expected related to Seward Park or the UPARR replacement area during construction.

Public Services

Slower response times for police, fire, and safety emergencies in the parks and in the surrounding neighborhood could occur due to increased traffic along the construction route and closure of the parking lots which could increase distances traveled on foot for emergency services. This impact is considered minor because the traffic delays are anticipated to be minor.

There would be no direct impact on schools because the project area is not close enough to cause delays in school bus transportation or pedestrian travel times.

Utilities

Water: A new water line would be constructed for the CSO storage tank from the intersection of South Juneau Street and Lake Washington Boulevard South to the project facilities. Additionally, water might be used to control dust and wash equipment during construction. These activities typically would not interrupt water service to existing customers and the amount of water represents a small portion of the regional water supply. Short-term, temporary disruption of water service in Seward Park may occur when the new water line is connected to the existing system. The connection would be scheduled to avoid impacting water service during peak use periods.

Sewer: Construction of combined sewer system improvements would involve building new portions of the system (e.g., new sewer pipes to the CSO storage tank) and re-working certain existing portions of the system (e.g., modifying existing control structures). This construction would not interrupt sewer service to existing customers.

Solid Waste: Construction activities would generate solid waste consisting of asphalt, fencing, tennis court surfacing material, shrubbery, wood, paper waste, and various construction materials. The volume of generated waste and compostable materials represents a small portion of the regional solid water stream and construction activities would not disrupt normal solid waste collection at Seward Park.

Electrical Power: A new power line would be laid between the base of an existing service pole near the park entrance on South Juneau Street and the existing vault located at South Juneau Street and Lake Washington Boulevard South. Electrical power would be used for power tools, equipment, and lighting. These activities would not interrupt power service to existing customers and the amount of electricity represents a small portion of the regional power supply.

Communications: New cable lines for the CSO storage tank would be installed to transmit instrumentation monitoring data to SPU's control system during operation. Construction would not interrupt service to existing customers.

Drainage and Natural Gas: No direct impacts to drainage or natural gas are anticipated during construction.

15.2.1.2 After Construction

No significant impacts to public services and utilities are expected related to Seward Park or the UPARR replacement area after construction.

Public Services

No significant direct impacts to public services are anticipated after construction of the project.

Utilities

Water: Water would be used to flush the CSO storage tank after storage events. It is anticipated that the tank would be used approximately 12 to 16 times a year depending on rainfall conditions, and approximately 16,000 gallons of water would be used for a cleaning flush after each use. This would be equivalent to the water consumption of three single-family homes for one year. The peak flow rate to the facility is anticipated to be approximately 100 gallons per minute. Additionally, water would be used to irrigate new plants during their establishment period, which is a minimum of three years. The amount of water represents a small portion of the regional water supply.

Sewer: The proposed project would result in improvements to the combined sewer system function due to the installation of new equipment and pipes. This would improve the functioning of the combined sewer system, including a reduction of CSO events from Basin 44 to a long-term average of no more than one untreated discharge per year. King County's West Point Treatment Plant and the conveyance system to the treatment plant would receive additional sewage flows because of the project. The increased flow represents a minor increase of less than 1 percent and would only occur when capacity in the sewer conveyance system is available.

Drainage: Following construction, stormwater from the reconstructed parking lots would receive treatment prior to discharge in Lake Washington. This would improve the drainage system, because stormwater runoff is currently discharged without treatment.

Electrical Power: Electrical power would be used during operations to power equipment to drain, clean, and ventilate the CSO storage tanks. This impact is considered minor because the amount of electricity represents a small portion of the regional power supply.

Solid Waste, Natural Gas and Communications: No direct impacts to solid waste, natural gas, or communications are anticipated after construction.

15.2.2 Indirect Impacts - Tennis Courts and Parking Lot Alternatives

No indirect impacts to utilities and public services were identified.

15.2.3 Direct and Indirect Impacts – No Action Alternative

Under the No Action Alternative, the CSO storage tank would not be built and the shoreline treatment and transfer of grant restrictions would not be implemented. However, the existing CSO outfall is expected to be replaced between 2015 and 2020 as part of the SPU Outfall Rehabilitation Program. The direct and indirect impacts of the CSO outfall replacement would be addressed by a separate SEPA environmental review process that would be conducted prior to the CSO outfall replacement.

15.3 What measures would reduce or eliminate potential impacts to public services and utilities?

For both the Tennis Courts Alternative and the Parking Lot Alternative, SPU would take measures to help reduce or eliminate potential impacts to public services and utilities during and after construction. The measures would include, but are not limited to, those listed below:

- Notify law enforcement and fire and safety agencies of estimated truck trips and schedules so they can adjust their service area and routes if needed to maintain response times.
- Notify law enforcement and fire/emergency services providers in advance when access to Seward Park would be reduced.
- Provide advance notice and coordinate with affected utilities, such as solid waste service providers, to minimize disruption of services.
- Recycle and compost construction debris to the extent possible to minimize solid waste.

15.4 Would the proposed project have any significant unavoidable adverse impacts on public services and utilities?

No significant unavoidable adverse impacts on public service or utilities are anticipated during or after construction.

16 Environmental Justice

16.1 What are the regulations related to Environmental Justice?

Federal agencies are required to achieve environmental justice by addressing "disproportionately high and adverse human health and environmental effects on minority and low-income populations" (Executive Order No. 12898, CEQ 1997). To do this, the demographics are examined to determine whether minority populations or low-income populations are present in the area affected by a proposed project. If so, a determination must be made as to whether the proposed project may cause disproportionately high and adverse human health or environmental effects on these populations.

The Council on Environmental Quality (CEQ) defines "minority" to consist of the following groups: Black/African Americans, Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaskan Native, and Hispanic populations (CEQ 1997). For this analysis, "minority" also included all other nonwhite racial categories within the U.S. Census Bureau's 2010 Census of Population and Housing, such as "some other race" and "two or more races." The analysis used the Census 2010 data.

16.2 What are the minority and low-income populations in the project vicinity?

The study area is approximately defined as the 2010 Census tracts that encompass the project areas for the Tennis Courts Alternative, the Parking Lot Alternative, the UPARR replacement area, and both construction routes. The study area is intended to capture construction impacts and the beneficial operational effects of those who live closest to the project area and construction routes.

16.2.1 Minority Populations

Figure 16-1 shows the Census tracts within the study area. Table 16-1 shows total and minority population data for each Census tract, along with City of Seattle, King County, and Washington State statistics for comparison.

All three Census tracts include large minority concentrations. Two of the Census tracts (101 and 103) include minority concentrations that are greater than 50 percent of the total population, as does the study area as a whole. The study area has a higher combined minority concentration than Seattle, King County, and the state as a whole. Blacks/African Americans are the largest minority group in the study area, comprising 23 percent of the total population followed by Asian, Native Hawaiian, or Other Pacific Islanders at 21 percent of the total population. Whites comprise 37 percent of the study area.

Table 16-1. 2010 Demographic Data – Minority Populations

Census Location	Total Population	Minority Population	Percent Minority
Washington State	6,724,540	2,283,968	34%
King County	1,931,249	777,782	40%
City of Seattle	608,660	226,119	37%
Study Area			
Census Tract 101	6,553	4,356	66%
Census Tract 102	4,835	2,236	46%
Census Tract 103	5,940	4,305	73%
Study Area Total	17,328	10,897	63%

Source: US Census 2010

In addition to the formal study area around the parks and construction routes, where most of the construction impacts would be experienced, park users come from a broader area throughout the Puget Sound region. Seattle Parks does not keep data on minority and low-income users of Seward Park and Lake Washington Boulevard Park. Seattle Parks estimates that:

- Weekday users mostly come from the surrounding community.
- Weekend visitors come from a broader area.

There are many cultural, athletic, and other types of events that draw a large number of people from the region and beyond. These events are estimated to have less than half minority participation on average (Parks 2011b).

16.2.2 Low-Income Populations

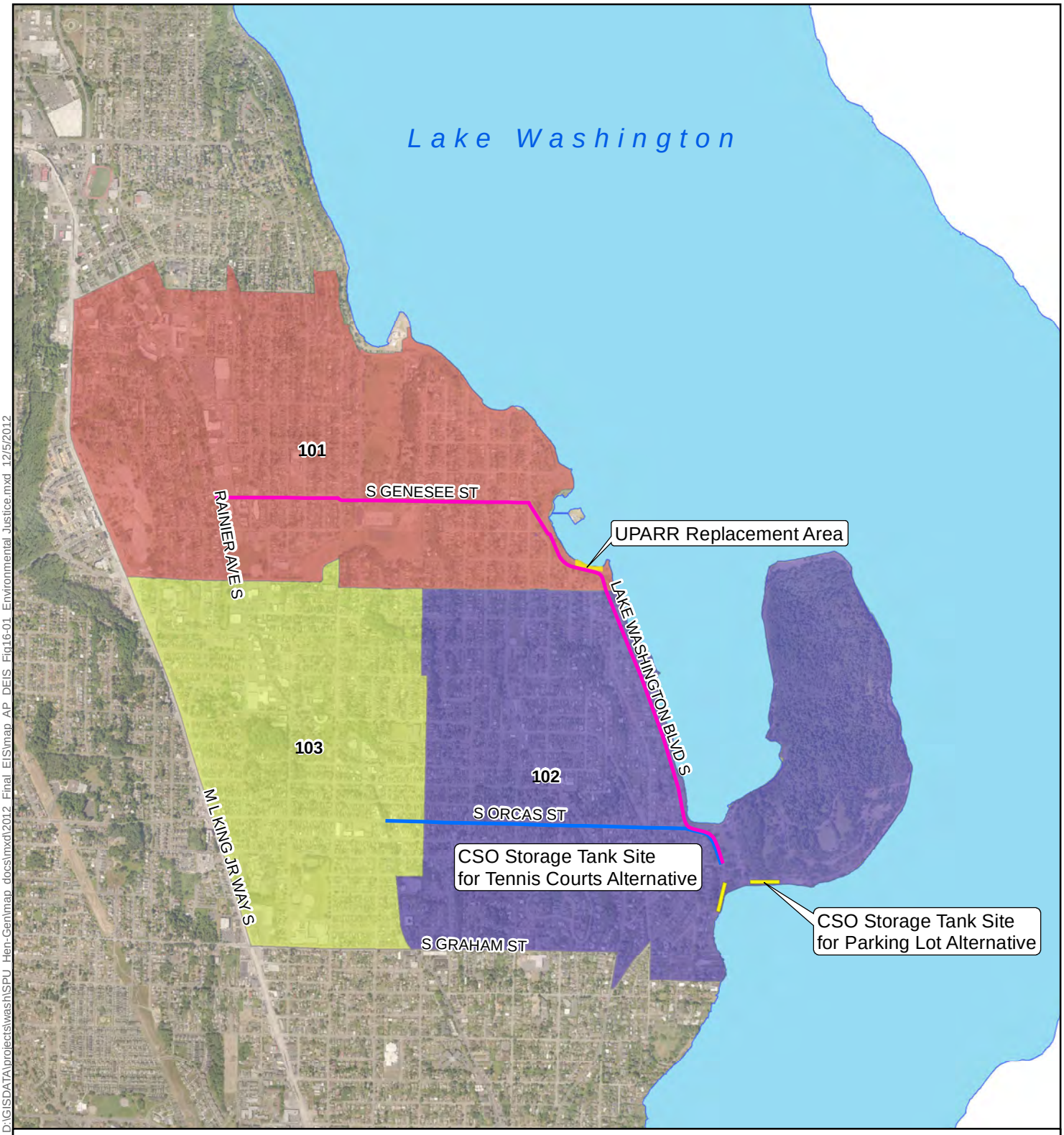
The U.S. Census provides data on the percentage of the population that is below the poverty level and on low-income populations. "Low-income" are those households with income at 150 percent of the poverty level. Table 16-2 shows poverty level and low-income statistics for the Census tracts, along with Seattle, King County, and Washington State for comparison. Almost one-third of the population in the study area would be considered low-income, which is slightly higher than that of the City of Seattle and King County, and more than double that of the state as a whole.

Table 16-2. 2010 Demographic Data – Low-Income Populations

Census Location	Population for whom Poverty Determined[1]	Percent Below Poverty Level	Percent Low-Income
Washington State	6,615,922	13%	14%
King County	1,905,324	12%	21%
City of Seattle	588,062	15%	26%
Study Area			
Census Tract 101	5,756	8%	25%
Census Tract 102	4,786	5%	33%
Census Tract 103	5,933	20%	31%
Study Area Total	16,475	11%	29%

Source: US Census 2010

[1]The determination of poverty is only applies to individuals 16 years old and above.



D:\GISDATA\projects\wash\SPU Hen-Gen\map docs\mxd\2012 Final EIS\map AP DEIS Fig16-01 Environmental Justice.mxd 12/5/2012

Legend

- Potential Construction Route 1
- Potential Construction Route 2
- Potential Project Areas

2010 Census Tracts

- 101
- 102
- 103

0 600 1,200 2,400 Feet

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

ENVIRONMENTAL JUSTICE STUDY AREA

JANUARY 2013 | **FIGURE 16-1**

This page was left intentionally blank.

16.3 How would the proposed project affect environmental justice populations?

16.3.1 Direct Impacts – Tennis Courts and Parking Lot Alternatives

The impacts would be the same for both alternatives, unless noted otherwise.

16.3.1.1 During Construction

No significant adverse human health or environmental impacts to environmental justice populations are expected related to Seward Park or the UPARR replacement area during construction.

As discussed in previous chapters (particularly Chapter 4 Recreation), there are potential short-term impacts on park users. Examples include the temporary closure of Parking Lots 1 and 2, limits on certain uses of Seward Park including the tennis courts and playground, and potentially fewer large events in Seward Park. Weekday park users mostly come from the area surrounding Seward Park, which is more ethnically diverse (63% minority) than the overall city (37% minority). Therefore, the impacts during weekdays may have a disproportionate affect on minorities using Seward Park. Weekend park users come from a broader area, which is less diverse. Therefore, the impacts during weekends would likely not disproportionately affect minorities using Seward Park. The impacts are not significantly different than those that will be felt when SPU constructs CSO improvements in other areas of the city, including areas that are less diverse than the Seward Park area.

The area surrounding Seward Park is not significantly more economically disadvantaged (29% low-income) than the overall city (26% low-income). Therefore, the impacts would not appear to have a disproportionate affect on low-income populations using Seward Park.

Transferring the UPARR projections to the UPARR replacement area does not have environmental justice impacts.

16.3.1.2 After Construction

No impacts to environmental justice populations are expected related to Seward Park or the UPARR replacement area after construction.

16.3.2 Indirect Impacts - Tennis Courts and Parking Lot Alternatives

The project would not cause a disproportionate indirect impact to low-income or minority populations or change economic or demographic patterns.

16.3.3 Direct and Indirect Impacts – No Action Alternative

Under the No Action Alternative, the CSO storage tank would not be built and the shoreline treatment and transfer of grant restrictions would not be implemented. However, the existing CSO outfall is expected to be replaced between 2015 and 2020 as part of the SPU Outfall Rehabilitation Program. The direct and indirect impacts of the CSO outfall replacement would be addressed by a separate SEPA environmental review process that would be conducted prior to the CSO outfall replacement.

16.4 What measures would reduce or eliminate potential impacts on environmental justice populations?

For both the Tennis Courts Alternative and the Parking Lot Alternative, the measures described in Chapters 4 through 15 and 17 to reduce or eliminate potential adverse impacts also would benefit all populations in the area, including environmental justice populations. In particular, the measures to address recreation and transportation impacts would reduce construction impacts on environmental justice populations, just as they would for the general population.

16.5 Would the proposed project have any disproportionately high adverse impacts on environmental justice populations?

As described in Chapter 4 Recreation, the proposed project would have the following short-term unavoidable impacts:

- Temporary closure of tennis courts
- Temporary closure of Parking Lot 1
- Temporary closure of Parking Lot 2

The impacts of those temporary closures may have a disproportionate affect on minorities using Seward Park during weekdays because weekday park users mostly come from the area surrounding Seward Park, which is more ethnically diverse (63% minority) than the overall city (37% minority).

16.6 What is the Environmental Justice determination for the proposed project?

When determining whether a project would have disproportionately high and adverse human health or environmental effects on minority and low-income populations, agencies take into account measures to reduce or eliminate potential adverse impacts, enhancements, and potential offsetting benefits to the affected minority or low-income populations.

Environment justice populations using Seward Park may be disproportionately affected because of the proposed project. This finding was reached considering the following:

- The proposed project would have potential short-term impacts on park users (e.g., temporary closure of Parking Lots 1 and 2), which are discussed in previous chapters (particularly Chapter 4 Recreation).
- Minority populations using Seward Park may be disproportionately affected because weekday park users mostly come from the area surrounding Seward Park, which is more ethnically diverse (63% minority) than the overall city (37% minority).
- Low-income populations using Seward Park are not expected to be disproportionately affected because the area surrounding Seward Park is not significantly more economically disadvantaged (29% low-income) than the overall city (26% low-income).
- No adverse impacts to environmental justice populations are expected after construction.

The impacts are not significantly different than those that will be felt when SPU constructs CSO improvements in other areas of the city, including areas that are less diverse than the Seward Park area.

SPU would continue to inform the public – including minority and low-income populations – about the proposed project throughout its duration.

This analysis meets the provisions of Executive Order 12898, as it is supported by Title VI of the Civil Rights Act.

This page was left intentionally blank.

17 Cumulative Impacts

17.1 What are cumulative impacts and why do we study them?

Cumulative impacts are impacts on the environment that result from the incremental consequences of a proposed project when added to other past, present, and reasonably foreseeable future actions (or projects), regardless of who undertakes these actions. Cumulative impacts can result from individually minor, but collectively significant, action taking place over time.

Federal[1], state[2], and local[3] regulations require that cumulative impacts be considered in an EIS because these impacts inform the public and decision makers about possible unintended consequences of a proposed project that are not always revealed by examining direct and indirect impacts alone. This information helps project planners design measures that reduce or eliminate potential direct impacts under their control in ways that can make adverse cumulative impacts less severe. SPU cannot reduce or eliminate all cumulative impacts because it does not have jurisdiction over non-SPU projects that contribute to cumulative impacts. However, SPU is required to disclose cumulative impacts under NEPA and to suggest, when possible, practical measures that could be implemented by the responsible parties (USEPA 2008).

Reasonably Foreseeable Future Actions

A "reasonably foreseeable future action" is a private or public project already funded, permitted, or under regulatory review, or included in an approved final planning document. "Reasonably foreseeable" includes projects with a reasonable expectation of actually happening, as opposed to potential developments expected only on the basis of speculation.

A cumulative impact analysis was performed for the resources listed below based on the results of scoping, agency, and stakeholder consultations, and anticipated direct and indirect impacts of the proposed project:

- Recreation
- Cultural Resources
- Habitat, Wildlife and Fish
- Transportation
- Water Resources

Project analysts reviewed possible direct and indirect effects for the remaining elements and determined that the level of impacts on the resources would be low and when combined with the impacts from other past, present, and reasonably foreseeable future actions, would be inconsequential. Therefore, a cumulative impacts discussion for those elements is not included.

[1] 40 CFR 1502.16, 1508.7, 1508.8
[2] Ecology 2011
[3] SMC 25.05.670

17.1.1 How were boundaries determined for the cumulative impact analysis?

The geographic study area used for cumulative impact analysis is the total area of the resource that could be influenced by the direct or indirect impacts of the proposed project in combination with the impacts of past, present, and reasonably foreseeable future actions.

A cumulative impact analysis focuses on the future. The analysis goes far enough into the future to account for the potential direct and indirect impacts of the proposed project, along with other present and reasonably foreseeable future actions. However, the cumulative impacts on the resource also include persisting influences from past projects; therefore, the past is taken into account when characterizing the baseline condition.

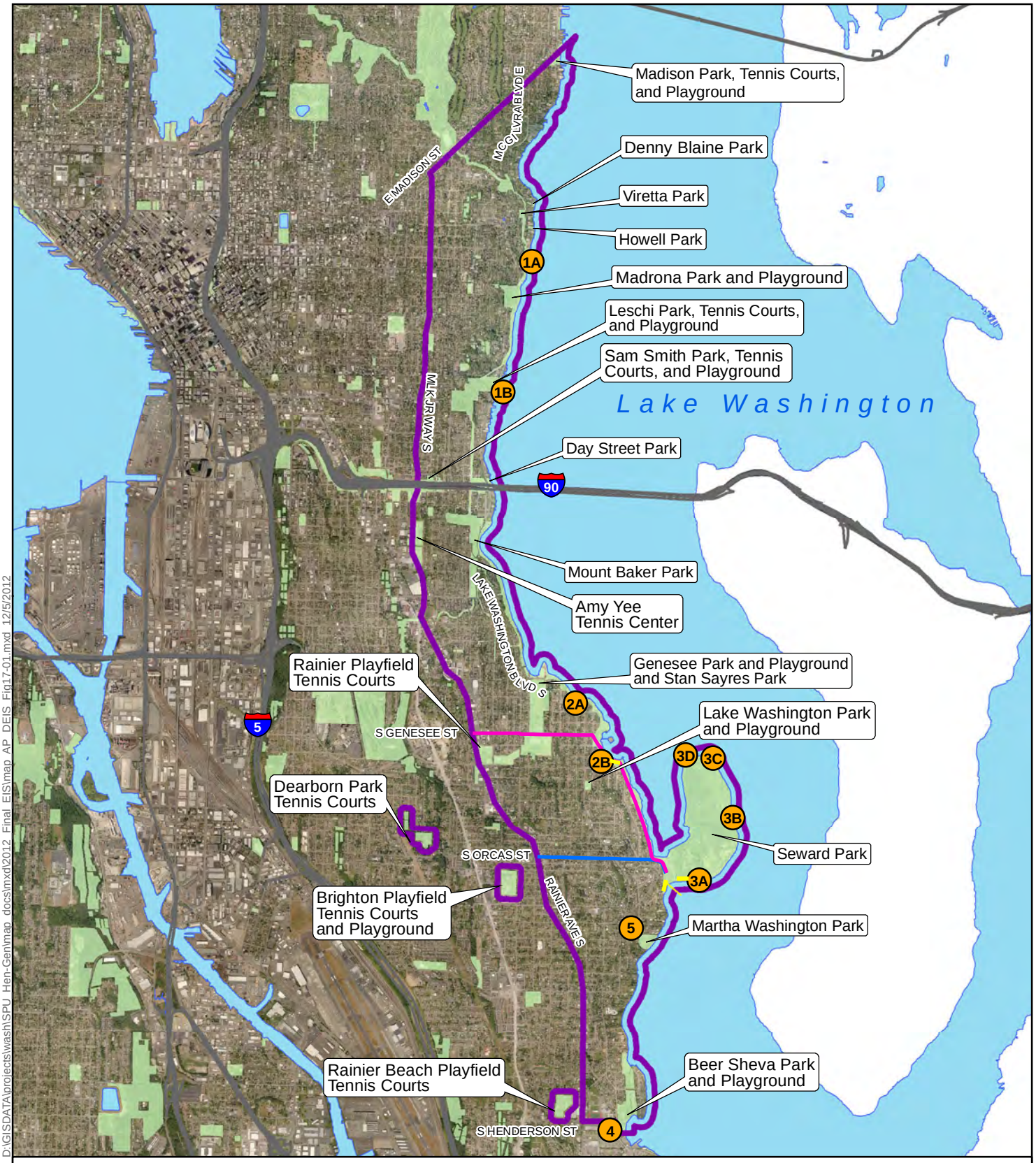
The study area and timeframe used for the cumulative impact analysis of each of the resources analyzed are described below.

Recreation: The geographic area for analyzing cumulative impacts on recreational resources is shown on Figure 17-1. This area encompasses multiple parks, a subset of which offer shoreline-based recreation, tennis courts, and playgrounds, and all of which may receive cumulative impacts from the proposed project. While Seward Park and Lake Washington Boulevard Park are along the shoreline and offer shoreline-based recreational opportunities, the geographic boundary extends a modest distance to the west to capture potential cumulative impacts on recreational areas close to the shoreline.

The time for analyzing cumulative impacts on recreation extends from 1903 through the end of SPU's CSO compliance period of 2025. The city hired the Olmsted Brothers in 1903 to develop a citywide plan for parks, including the areas that are now Seward Park and Lake Washington Boulevard Park (FOSP 2011b). This is the time period when the two parks clearly began to be developed for recreation. Information on how the two parks evolved from 1903 is discussed in Appendix C.

Cultural Resources: The geographic area for analyzing cumulative effects on cultural resources includes Seward Park, Lake Washington Boulevard and its associated parkland, and the other elements of the Olmsted-designed Seattle Parks and Boulevard System.

While the area has been used since prehistoric times by Native American peoples, the period for analyzing cumulative impacts on cultural resources extends from 1911, when Seward Park was acquired by the City of Seattle and designated as a park, to the end of the proposed construction period in 2017. No impacts are expected on archaeological resources because none were identified; therefore, the time for the beginning of the cumulative impact analysis was selected to reflect the time when the city acquired the park and changes to historic resources began.



D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EIS\map_AP_DEIS_Fig17-01.mxd 12/5/2012

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

RECREATION CUMULATIVE IMPACTS STUDY AREA AND LOCATIONS OF CURRENT AND REASONABLY FORSEEABLE ACTIONS

JANUARY 2013

FIGURE 17-1

This page was left intentionally blank.

Habitat, Wildlife, and Fish: The geographic area for analyzing cumulative impacts on habitat, wildlife, and fish encompasses Seward Park, the UPARR replacement area, the shoreline lands and nearshore from Beer Sheva Park in the south to Madison Park in the north, and westward to where hardscaped development dominates (the western boundary varies along the lake shoreline). This encompasses the area where most direct and indirect impacts of the project on habitat, wildlife, and fish would occur, along with the impacts of other reasonably foreseeable future actions. It also provides a broad enough area in which to compare the proposed project's impacts on habitat, wildlife, and fish to other projects within the geographic area.

The period for analyzing cumulative impacts on habitat, wildlife, and fish extends from 1903 (the Olmsted Brother's citywide plan for parks, when the number of people using the Seward Park and Lake Washington Boulevard areas accelerated) through the end of SPU's CSO compliance period of 2025.

Transportation: The geographic area for analyzing cumulative impacts on transportation is shown on Figure 17-2. This area encompasses the construction routes likely to be used for the proposed project, as well as other reasonably foreseeable future SPU projects in the area that likely would have impacts associated with transportation.

The period for analyzing cumulative impacts associated with transportation is the proposed construction period, which extends from mid-2015 through the end of 2017.

Water: The geographic area for analyzing cumulative impacts on water resources is Lake Washington. This encompasses the area where most direct and indirect impacts of the project would occur, along with the impacts of other reasonably foreseeable future actions. It also provides a broad enough area in which to compare the proposed project's impacts on water quality to other projects within the geographic area.

The period for analyzing cumulative impacts on water quality extends from 1903 (the Olmsted Brother's citywide plan for parks) through the end of SPU's CSO compliance period of 2025.

17.1.2 How were other past, present, and reasonably foreseeable future actions identified?

SPU collected information on past and proposed projects that may contribute to cumulative impacts from field surveys, interviews with other public agencies, and from the public. The review for projects that might contribute to cumulative impacts focused on Seattle Parks projects, SPU projects, WSDOT projects, Seattle City Light projects, and other projects planned near Seward Park and Lake Washington Boulevard Park. In addition to their locations, the proposed timeframes of these projects were reviewed to determine whether they could occur within the same timeframe as the proposed project.

Table 17-1 briefly describes the projects that are considered present and reasonably foreseeable future actions for the cumulative impact analysis. Figure 17-3 and Figure 17-4 show the project locations.

Table 17-1. Present and Reasonably Foreseeable Future Actions

Map ID	Project	Description of Project	Construction Period
Proposed Project	SPU Henderson Basin 44 CSO Reduction Project	Construction of 2.4 MG underground storage tank and conveyance pipes, odor control facilities, and control systems. The project includes additional infrastructure, shoreline, and landscape improvements.	2015 - 2017
1A	SPU Outfall Rehabilitation Program: NPDES 28	Rehabilitation of an existing CSO outfall located in Lake Washington near Madrona Park.	By November 2015
1B	SPU Outfall Rehabilitation Program: NPDES 31	Rehabilitation of an existing CSO outfall located in Lake Washington near Leschi Park.	By November 2015
2A, 2B	SPU Genesee CSO Reduction Project	Installation of 0.48 MG and 0.12 MG underground storage tanks, odor control facilities, pipelines, and control systems at two sites. The project would disrupt recreation activities during construction, six parking spaces would be permanently eliminated; and the project could limit recreational opportunities or park amenities that could occur in those locations in the future.	2013 – 2014[1]
3A, 3B, 3C, 3D	WSDOT SR 520 Aquatic Mitigation Plan 1,2,3,4 (WSDOT and FHWA 2011)	Four aquatic mitigation projects in Seward Park, designed to enhance shoreline and nearshore environments through hard structure removal, riparian restoration, and gravel supplementation for spawning.	2016 - 2017
4	SPU 52nd Avenue South CSO Reduction Project and Mapes Creek Restoration Project	Installation of approximately 1,800 feet of 18-inch-diameter CSO conveyance pipe, 6 maintenance holes, aboveground electrical and controls cabinet, motor-operated gate structure, and flume (a device used to measure sewer flows located within the sewer). Mapes Creek would be redirected into a new 24-inch-diameter pipe approximately 1,600 feet long, with a diversion structure and energy dissipation system. Mapes Creek would discharge into a 300-foot to 400-foot-long channel that would meander through the park to its discharge point into Lake Washington. A paved bicycle/pedestrian walkway would temporarily be closed during construction. A new pedestrian bridge is planned within the park over the new creek channel.	2013 – 2015
5	SPU Henderson Basin 45 CSO Reduction Project	Installation of 0.2 MG underground storage and conveyance pipes, odor control facilities, and control systems. The project would be located in a private property adjacent to Martha Washington Park; part of the park would be closed to recreational use during construction.	2015 - 2018

D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012 Final EIS\map_AP_DEIS_Fig17-02.mxd 12/5/2012

Legend

- Potential Project Areas
- Park
- Geographic Study Area
- Potential Construction Route 1
- Potential Construction Route 2
- Location of Other Projects

0 2,000 4,000 8,000 Feet

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

TRANSPORTATION CUMULATIVE IMPACTS STUDY AREA AND LOCATIONS OF CURRENT AND REASONABLY FORSEEABLE ACTIONS

JANUARY 2013 | **FIGURE 17-2**

This page was left intentionally blank.

D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EIS\map_AP_DEIS_Fig17-03.mxd 12/5/2012

Legend

- Potential Project Areas
- Park
- Lake Washington Blvd Park (to Madison St.)
- Location of Other Projects

0 2,000 4,000 8,000 Feet

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

PROJECTS CONSIDERED FOR CUMULATIVE IMPACTS

JANUARY 2013 | **FIGURE 17-3**

This page was left intentionally blank.

D:\GISDATA\projects\wash\SPU_Hen-Gen\map_docs\mxd\2012_Final_EIS\map_AP_DEIS_Fig17-04_WSDOTProjects.mxd 12/5/2012

Legend

- Proposed Aquatic Mitigation - 520 Project
- Proposed Shoreline Treatment - CSO Reduction Project
- Proposed CSO Storage Tank - CSO Reduction Project
- Seward Park

0 250 500 1,000 Feet

N

Seattle Public Utilities

HENDERSON BASIN 44 CSO REDUCTION PROJECT
FINAL ENVIRONMENTAL IMPACT STATEMENT

WSDOT SR520 SEWARD PARK AQUATIC MITIGATION PROJECTS

JANUARY 2013

FIGURE 17-4

This page was left intentionally blank.

17.2 How has the evolution of the study areas contributed to cumulative impacts for the resources?

This section discusses how the study areas for cumulative impacts have evolved over time, and how the incremental changes that have occurred during the study periods for each resource have contributed to the current condition of the resource and cumulative effects. The contribution to cumulative effects from the proposed action and other reasonably foreseeable actions is discussed in Section 17.3.

17.2.1 Recreation

Seward Park has undergone changes since the Olmsted Brothers' 1912 preliminary plan for the Park. The improvements in Seward Park, like many large parks, were incremental over time. A 1936 plan of Seward Park in the Seattle Post-Intelligencer (PI) shows the amount of changes that had occurred since the opening of the park. These included the perimeter drive, large open meadow areas from clearing of trees, several large parking lots, a fish hatchery, and a new and larger entrance due to the lowering of Lake Washington in 1916. A 1950 plan in the Seattle PI illustrates additional changes, but with greater attention to the magnificent forest in the middle of the park (International Forestry Consultants, Inc., 2005). In 1953, the amphitheater was built to provide a venue for outdoor music. In 1970, the perimeter road was closed to vehicles, but remained open for bicyclists and pedestrians.

The changes that have accrued over time in Seward Park have evolved away from several Olmsted design principles and the preliminary plan of 1912. The Olmsted plan did include a variety of activities, many of which were located on the northern point of the peninsula, but the majority of the park interior was to be preserved as a forest. As the Seward Park Vegetation Management Plan states, "One can only conjecture how their ideas would have translated to reality" (Parks 2005). The design principle of unified composition has diminished as the park was divided by roads and various activities. The principle of orchestration of movement and uses are not as organized and logically separated as the Olmsteds envisioned. The incorporation of non-native trees and removal of understory plantings has resulted in loss of sustainable design. The principles of place and comprehensive approach are still visible.

17.2.2 Cultural Resources

The park has undergone numerous changes and improvements since it was first designated a city park in 1911. While the changes proposed by the project (for both the Tennis Courts Alternative and the Parking Lot Alternative) would result in an adverse effect on the Seward Park Historic District and Designed Landscape under NHPA Section 106, the proposed measures to minimize impacts would result in an overall minor change to the historic district. The cumulative impacts to the historic property from this project would be negligible.

17.2.3 Wildlife, Habitat, and Fish

Over time, original terrestrial habitat along the shoreline has been replaced with parks, residences, and commercial settings with plants existing mostly in landscaped areas that provide poor habitat quality for terrestrial animals. As a result, terrestrial populations have decreased. Lake Washington provides aquatic habitat but the same developmental pressures have degraded the quality of habitat for aquatic species with a corresponding decline in aquatic populations.

17.2.4 Transportation

The project vicinity and the geographic area for the analysis of cumulative impacts have undergone the development of transportation networks since the early development of the City of Seattle. The transportation network within the geographic area of analysis has been built out for many years and contains a full network of streets, sidewalks, and alternate modes of transportation.

17.2.5 Water

The water quality of Lake Washington has been greatly influenced by human activities. In the early- to mid-1950s, Lake Washington was directly receiving untreated or partially-treated municipal sewage, which led to increased growth of algal populations and reduced dissolved oxygen in the lake. Discharges of untreated or partially treated sewage ceased in the 1960s. In 1968, the depth of transparent or clear water was 10 feet below the water surface (King County 2011). Water transparency continued to improve over time, with water transparency reaching depths of 17 to 20 feet with a maximum depth of almost 25 feet in 1993 (King County 2011). Operation of the West Point and South treatment plants and elimination of raw sewage discharges into Lake Washington was one of many efforts to improve water quality conditions of the lake. Historically, untreated stormwater was discharged to the lake through outfalls. Efforts are underway to retrofit older outfalls with stormwater treatment and new outfalls include enhanced treatment. Industrial uses in the Lake Washington basin have led to increased concentrations of persistent toxins, such as polycyclic aromatic hydrocarbons (PAHs), polychlorinated biphenyls (PCBs), and heavy metals in lake sediments (King County 1995). The introduction of non-native, invasive plant species, such as Eurasian watermilfoil (*Myriophyllum spicatum*), into Lake Washington in the 1970s has altered the physical characteristics of habitats near the shore.

17.3 How would the proposed project and other present and reasonably foreseeable future actions contribute to cumulative impacts on recreation?

Potential cumulative impact contributions associated with the proposed project, as well as with other present and reasonably foreseeable future actions, are described below and summarized in Table 17-2.

17.3.1 Recreation

17.3.1.1 Proposed Project

During construction, the proposed project would contribute to adverse cumulative impacts on recreation because construction traffic along the proposed construction routes for the project could increase noise at other parks that have projects in construction at the same time. Parking loss at Seward Park during construction could increase parking congestion at nearby parks that have projects in construction at the same time.

After construction, the proposed project would contribute to adverse cumulative impacts on recreation because the presence of the CSO facilities would limit future opportunities to change to some other recreational use, eliminate either two (Tennis Courts Alternative) or five (Parking Lot Alternative) combined public parking spaces at Parking Lots 1 and 2, and contribute to the incremental change in the recreational character of the area's Olmsted Parks.

17.3.1.2 Other Present and Reasonably Foreseeable Future Actions

Other present and reasonably foreseeable future actions listed in Table 17-1 may contribute to cumulative impacts on recreation. These include projects 1A, 1B, 2A, 2B, 3A-3D, and 5. These projects were identified due to their impact on nearby parks that offered similar shoreline-based recreation, tennis courts, or playgrounds. The anticipated cumulative impacts of these projects are described below.

Projects 1A and 1B: During construction, the proposed project, in conjunction with Project 1A and 1B, would contribute to adverse cumulative impacts to recreation because multiple parks (Seward Park, a portion of Lake Washington Boulevard Park, and Madrona Park) would have partial closures at the same time, resulting in restricted access and recreational users seeking other parks in the area.

Projects 2A-2B: After construction, the proposed project, in conjunction with Projects 2A-2B, would contribute to adverse cumulative impacts to recreation because the projects would each permanently eliminate public parking spaces in parks (either two or five spaces in Seward Park; four spaces in the Lake Washington Boulevard South and 49th Avenue South parking lot, and two spaces in the Lake Washington Boulevard South and 53rd Avenue South parking lot).

Projects 3A-3D: During construction, the proposed project, in conjunction with Projects 3A-3D, would contribute to adverse cumulative impacts to recreation because more construction activity would be occurring at the same time in Seward Park, resulting in increased traffic and construction vehicles, more closed areas in the park, and increased noise.

After construction, the proposed project and Projects 3A and 3C would contribute to beneficial cumulative impacts to recreation because the projects would each enhance the Olmsted design principles as part of their re-vegetation work.

Project 5: During construction, the proposed project, in conjunction with Project 5, would contribute to adverse cumulative impacts to recreation because multiple parks (Seward Park, a portion of Lake Washington Boulevard Park, and Martha Washington Park) would have partial closures at the same time, resulting in restricted access and recreational users going elsewhere, increasing the demand on other parks in the area.

17.3.2 Cultural Resources

17.3.2.1 Proposed Project

No archaeological resources have been identified in the APE. No impacts on archaeological resources are anticipated from the proposed project. Therefore, the project would not contribute to cumulative impacts on archaeological resources.

17.3.2.2 Other Present and Reasonably Foreseeable Future Actions

Although some reasonably foreseeable future actions described in Table 17-1 may impact other Olmsted-designed parks in the area, such as Lake Washington Boulevard Park and Madrona Park, the project as planned would likely have minor impacts on those parks. Together with the Seward Park impacts, they would not constitute a significant cumulative effect that is detrimental to the overall Olmsted Parks and Boulevard System for Seattle

17.3.3 Habitat, Wildlife, and Fish

For the cumulative impact analysis of wildlife and fish, SPU assumes that all present and reasonable foreseeable future actions would be subject to regulations related to wildlife and fish, particularly those for protected animal species.

17.3.3.1 Proposed Project

During construction, the proposed project would contribute to adverse cumulative impacts on habitat, wildlife, and fish because the upland habitat in the construction area would not be available to wildlife and fish may temporarily move away from the area.

After construction, the proposed project would contribute to beneficial cumulative impacts on habitat, wildlife, and fish because the improved water quality would benefit the aquatic food web and habitat would be improved through the shoreline treatment and re-vegetation work.

Table 17-2. Contributions to Cumulative Impacts from the Proposed Project and Other Present and Reasonably Foreseeable Future Actions

Map ID	Project	Resources									
		Recreation		Cultural Resources		Habitat, Wildlife, and Fish		Transportation		Water	
		During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)
Proposed Project	SPU Henderson Basin 44 CSO Reduction Project	• Increased parking congestion and noise at nearby parks.	• Limit certain future uses in the location of the CSO facilities. • Combined loss of either two (Tennis Courts Alternative) or five (Parking Lot Alternative) public parking spaces in Parking Lots 1 and 2. • Incremental change in the recreational character of the area's Olmsted Parks.	• N/A	• Minor adverse effect on the Seward Park Historic District and Designed Landscape.	• Limited access to habitat in the construction area. • Displacement of some fish and wildlife.	• Improved aquatic habitat and food web through water quality improvements. • Improve upland and aquatic habitat through restoration work.	• Increased traffic in the project vicinity. • Potential damage to roads. • Potential disruption to pedestrians and bicyclists.	• N/A	• Potentially introduce sediment and other pollutants via runoff or disturbance of potentially contaminated soil near the existing CSO outfall pipe.	• Improved water quality in Lake Washington due to reduced frequency and volume of CSO events.
1A	SPU Outfall Rehabilitation Program: NPDES 28	• Partial closure of Madrona Park. • Increased use of nearby parks.	• N/A	• N/A	• N/A	• Limited access to habitat in the construction area. • Displacement of some fish and wildlife.	• Improved aquatic habitat and food web through water quality improvements.	• N/A	• N/A	• Potentially introduce sediment and other pollutants via runoff.	• Improved water quality by discharging CSOs at the intended distance in Lake Washington.
1B	SPU Outfall Rehabilitation Program: NPDES 31	• N/A	• N/A	• N/A	• N/A	• Limited access to habitat in the construction area. • Displacement of some fish and wildlife.	• Improved aquatic habitat and food web through water quality improvements.	• N/A	• N/A	• Potentially introduce sediment and other pollutants via runoff.	• Improved water quality by discharging CSOs at the intended distance in Lake Washington.
2A, 2B	SPU Genesee CSO Reduction Project	• N/A	• Permanent loss of 6 parking spaces.	• N/A	• N/A	• Limited access to habitat in the construction area. • Displacement of some fish and wildlife.	• Improved aquatic habitat and food web through water quality improvements.	• Increased traffic in the project vicinity. • Potential damage to roads. • Potential disruption to pedestrians and bicyclists.	• N/A	• N/A	• Improved water quality in Lake Washington due to reduced frequency and volume of CSO events.
3A, 3B, 3C, 3D	WSDOT SR 520 Aquatic Mitigation Plan 1,2,3,4 (WSDOT and FHWA 2011)	• Increased traffic and construction vehicles. • Increased noise. • More areas closed in Seward Park.	• Improved Olmsted design principles as part of re-vegetation work (Projects 3A and 3C only).	• N/A	• N/A	• Limited access to habitat in the construction area. • Displacement of some fish and wildlife.	• Improve upland and aquatic habitat through restoration work.	• Increased traffic in the project vicinity. • Potential damage to roads. • Potential disruption to pedestrians and bicyclists.	• N/A	• Potentially introduce sediment and other pollutants via runoff.	• N/A

Map ID	Project	Resources									
		Recreation		Cultural Resources		Habitat, Wildlife, and Fish		Transportation		Water	
		During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)	During Construction (Temporary Impact)	After Construction (Permanent Impact)
4	SPU 52nd Avenue South CSO Reduction Project and Mapes Creek Restoration Project	• N/A	• N/A	• N/A	• N/A	• Limited access to habitat in the construction area. • Displacement of some fish and wildlife.	• Improved aquatic habitat and food web through water quality improvements.	• N/A	• N/A	• Potentially introduce sediment and other pollutants via runoff.	• Improved water quality in Lake Washington due to reduced frequency and volume of CSO events.
5	SPU Henderson Basin 45 CSO Reduction Project	• Partial closure of Martha Washington Park. • Increased use of nearby parks.	• N/A	• N/A	• N/A	• Limited access to some habitat. • Displacement of fish and wildlife.	• Improved aquatic habitat and food web through water quality improvements.	• Increased traffic in the project vicinity. • Potential damage to roads. • Potential disruption to pedestrians and bicyclists.	• N/A	• N/A	• Improved water quality in Lake Washington due to reduced frequency and volume of CSO events.

17.3.3.2 Other Present and Reasonably Foreseeable Future Actions

During construction, the proposed project, in conjunction with all the projects in Table 17-1 would contribute to adverse cumulative impacts on habitat, wildlife, and fish because each project would limit access to some habitat and temporarily displace some wildlife and fish.

After construction, the proposed project, in conjunction with Projects 1A-B, 2A-B, 4, and 5 would contribute to beneficial cumulative impacts on habitat, wildlife, and fish because the projects would each improve water quality, which in turn would have a positive impact on aquatic habitat. Additionally, the proposed project, in conjunction with Projects 3A-D would contribute to beneficial cumulative impacts on habitat, wildlife, and fish because each project would improve shoreline or aquatic habitat, or both.

17.3.4 Transportation

17.3.4.1 Proposed Project

During construction, the proposed project would contribute to adverse cumulative impacts on transportation because the proposed project would create additional traffic in the area that could result in increased congestion along construction routes, damage to roadways, and construction vehicles disturbing pedestrians and cyclists.

17.3.4.2 Other Present and Reasonably Foreseeable Future Actions

During construction, the proposed project, in conjunction with Projects 2A, 2B, 3A-3D, and 5 would contribute to adverse cumulative impacts to transportation because more construction traffic would occur in the area causing increased traffic along construction routes, potential damage to roadways, and construction vehicles disrupting pedestrians and cyclists.

17.3.5 Water

For the cumulative impacts analysis of water quality, SPU assumed that all present and reasonable foreseeable future actions would be subject to regulatory limits related to water quality.

17.3.5.1 Proposed Project

During construction, the proposed project could contribute to adverse cumulative impacts on water because the proposed project could introduce sediment and other pollutants via surface water runoff or potentially release contaminated soil near the existing CSO outfall pipe, which would impact water quality in Lake Washington. However, the proposed project would include erosion and sediment controls, spill control and prevention, and other best management practices, such as silt curtains to avoid uncontrolled discharges that could affect water quality.

After construction, the proposed project would contribute to beneficial cumulative impacts on water because the proposed project would improve water quality in Lake Washington due to the reduced frequency and volume of CSO events.

17.3.5.2 Other Present and Reasonably Foreseeable Future Actions

During construction, the proposed project, in conjunction with Projects 1A-B, 3A-D, and 4, could contribute to adverse cumulative impacts on water because each project could potentially introduce sediment and other pollutants via runoff, thus impacting water quality in Lake Washington. However, the projects would include erosion and sediment controls, spill control and prevention, and other best management practices, such as silt curtains to avoid uncontrolled discharges that could affect water quality.

After construction, the proposed project, in conjunction with Projects 2A-B, 4, and 5, would contribute to beneficial cumulative impacts on water because each project would improve water quality in Lake Washington through the reduced frequency and volume of CSO events. Additionally, the proposed project, in conjunction with Projects 1A-B would contribute to beneficial cumulative impacts on water because each project would improve water quality by discharging CSO at the intended distance in Lake Washington. In addition, there may be other projects that drain to Lake Washington that would have improved stormwater treatment resulting in improved water quality in Lake Washington. Examples of major projects include the State Route 520 Bridge Replacement, the HOV Program, and the I-405 project. It is likely that they would contribute to positive cumulative impacts on water quality in Lake Washington.

17.4 What measures would be implemented to reduce or eliminate cumulative impacts?

For both the Tennis Courts Alternative and the Parking Lot Alternative, the following measures would be taken to help reduce or eliminate the potential contribution to cumulative impacts:

- Discuss with WSDOT possible ways to avoid simultaneous construction of the proposed project and the aquatic mitigation projects in Seward Park (Projects 3A-3D in Table 17-1), to reduce impacts related to traffic, noise, closed areas in the park, and habitat restrictions.
- Locate aboveground features in the least visible locations and likely provide vegetation enhancement with Olmsted values to screen aboveground features. Provide landscaping with Olmsted values in the UPARR replacement area.
- Protect existing trees to the greatest extent possible.
- Temporarily suspend construction activities in the right-of-way and limit usage of contractor parking and staging areas, if needed, to accommodate heavier-than-usual numbers of park users during seasonal peak usage periods (e.g., Seafair events).
- Limit lane closures or construction during peak traffic times. Provide advance public notice and signage to help ensure adequate public access to shoreline areas and parking during construction.
- Provide signage at Seward Park and on SPU and Seattle Parks websites regarding alternate driving routes to avoid construction traffic.

18 References

Audubon Center (Seward Park Environmental and Audubon Center). 2011. "2009-2011 Program Audit Report."

Beveridge, Charles E. 2000. "The Journal of the Victorian Society in America." *Olmsted – His Essential Theory in Nineteenth Century*: Vol. 20., No. 2. Fall 2000.

Brown, Paul V. Superintendent of Parks, to Seattle City Council. March 27, 1950. "Summary of Contracts Awarded." *Sherwood Collection,* 5801-01: Box 43, SMA.

CEQ (Council on Environmental Quality). 1997. Executive Office of the President. "Environmental Justice – Guidance under the National Environmental Policy Act." Washington, D.C. December 10, 1997. Available at http://ceq.hss.doe.gov/nepa/regs/ej/justice.pdf.

CIG (Climate Impacts Group). 2011a. Climate Change. Joint Institute for the Study of the Atmosphere and Ocean (JISAO), University of Washington. http://cses.washington.edu/cig/pnwc/cc.shtml

CIG (Climate Impacts Group). 2011b. Climate Variability. Joint Institute for the Study of the Atmosphere and Ocean (JISAO), University of Washington. http://cses.washington.edu/cig/pnwc/clvariability.shtml.

City of Seattle. 2008. *Seattle Community Greenhouse Gas Inventory* http://www.seattle.gov/archive/climate/docs/2008-community-inventory-fullreport.pdf

City of Seattle. 2011. Seattle Municipal Code. Chapter 23.44 and Section 23.44.028. Accessed on July 13, 2011, at: http://clerk.ci.seattle.wa.us/~scripts/nph-brs.exe?d=CODE&s1=23.44.028.snum.&Sect5=CODE1&Sect6=HITOFF&l=20&p=1&u=/~public/code1.htm&r=1&f=G.

Crowley, Walt. 1999. "Lake Washington Ship Canal." HistoryLink.org Essay 1444. July 1, 1999. http://www.historylink.org/index.cfm?DisplayPage=output.cfm&file_id=1444.

DPD (Seattle Department of Planning and Development). 2005. "Seattle Comprehensive Plan - A Plan for Managing Growth 2004-2024 Toward a Sustainable Seattle." January 2005. Available at: http://www.seattle.gov/dpd/cms/groups/pan/@pan/@plan/@proj/documents/web_informational/dpdp020401.pdf.

DPD (Seattle Department of Planning and Development). 2011. "Environmentally Critical Areas," Online GIS Maps. http://web1.seattle.gov/dpd/maps/dpdgis.aspx. Accessed June 2011.

DNR (Washington Department of Natural Resources). Natural Heritage Program. 2011. Sections that contain natural heritage features. http://www.dnr.wa.gov/Publications/amp_nh_trs.pdf.

Durning, Marvin B. 1969. From Seattle Design Commission to Hans Thompson, Superintendent of Parks, June 16, 1969. *Sherwood Collection*, 5801-01: Box 43, SMA.

Ecology (Washington Department of Ecology). 2008. "2008 Water Quality Assessment 305(b) Report and 303(D) List." http://www.ecy.wa.gov/programs/wq/303d/2008/index.html. Accessed June and July 2011.

Ecology (Washington Department of Ecology). 2011. *SEPA Online Handbook*, Chapter 3.3.3. http://www.ecy.wa.gov/programs/sea/sepa/handbk/hbch03.html #3.3.3

Executive Order No. 12898, 59 *Fed. Reg*. at 7629. 1994. "Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations." February 11, 1994.

FHWA (Federal Highway Administration). 2006. "Roadway Construction Noise Model" (FHWA-HEP-05-054).

Fresh, K.L., D. Rothaus, K.W. Mueller, and C. Waldbillig. 2003. "Habitat Utilization by Smallmouth Bass in the Littoral Zones of Lake Washington and Lake Union Ship Canal." Greater Lake Washington Chinook Workshop.

Hall, W. C., Jr. Park Engineer, for the Board of Commissioners, to F. D. Sheffield, P.W.O., King County Welfare Board, August 27, 1934. *Sherwood Collection*, 5801-01: Box 43, SMA.

HDR. 2012a. "Henderson Basin 44 CSO Reduction Project Traffic Analysis Technical Memorandum." September 2012.

HDR. 2012b. "Henderson North Combined Sewer Overflow Reduction Project Facility Plan." Prepared by HDR for Seattle Public Utilities. August 2012.

HDR. 2012c. "Henderson Basin 44 CSO Reduction Project Construction Noise Assessment Technical Memorandum." September 2012.

HDR. 2012d. "Henderson Basin 44 CSO Reduction Project Operational Noise Assessment Technical Memorandum." September 2012.

HDR. 2012e. "Phase I Environmental Site Assessment, Henderson CSO Reduction Project, Henderson Basin 44 CSO Reduction Project." September 2012.

Hockaday, Joan. 2009. *Greenscapes: Olmsted's Pacific Northwest*. Pullman: Washington State University Press. 2009.

HRA. 2012. "Cultural Resources Inventory for the Henderson Basin 44 CSO Reduction Project." Prepared for City of Seattle, King County, Washington. September 2012.

International Forestry Consultants, Inc. 2005. *Seward Park Vegetation Management Plan*. Prepared for Seattle Parks and Recreation by International Forestry Consultants, Inc. March 2005.

Kahler, T., M. Grassley, and D. Beauchamp. 2000. "A Summary of the Effects of Bulkheads, Piers, and Other Artificial Structures and Shorezone Development on ESA-Listed Salmonids in Lakes." Prepared for the City of Bellevue, Washington.

Kleen (Kleen Environmental Technologies, Inc). 1995. "Underground Storage Tank Removal, Seward Park Arts Annex Facility." December 1995.

King County. 2011. "Major Lakes Monitoring." http://green.kingcounty.gov/lakes/LakeWashington.aspx. Accessed June 2011.

Klingle, Matthew. 2007. *Emerald City: An Environmental History of Seattle*. New Haven, CT: Yale University Press.

MGS (MGS Engineering Consultants Inc). 2003. "Analysis of Precipitation-Frequency and Storm Characteristics for the City of Seattle." December 2003.

Moller, K., Fischer, M., Silverman, N., & Andrews, K. 2010. *Lake Washington Boulevard Vegetation Management Plan.* Prepared for Seattle Parks and Recreation. January 2010.

Parks (Board of Park Commissioners, Seattle Department of Parks and Recreation). 1953. "Summary of Contracts Awarded and Completed in 1953." *1953 Annual Report:* 11-14. SMA, 1802-H6.

Parks (Board of Park Commissioners, Seattle Department of Parks and Recreation). 1956. "Summary of Contracts Awarded and Completed in 1956." *1956 Annual Report*: 17-19. SMA, 1802-H6.

Parks (Seattle Department of Parks and Recreation). 2010. "Events in Parks." Excel™ Spreadsheet Documenting Special Events for the 2010 Calendar Year at Seward Park. December 31, 2010.

Parks (Seattle Department of Parks and Recreation). 2011a. Personal communication with Cheryl Eastberg, SPU Parks Project Coordinator. Supplying park use data. November 7, 2011.

Parks (Seattle Department of Parks and Recreation). 2011b, Personal communication with Cheryl Eastberg, SPU Parks Project Coordinator. Supplying park use data. February 9, 2012.

Parks (Seattle Department of Parks and Recreation). 2011c. Bicycle Sunday. http://www.seattle.gov/parks/bicyclesunday.

Parks (Seattle Department of Parks and Recreation). 2011d. Background information on Seward Park. http://www.seattle.gov/parks/environment/seward.htm. Accessed June 2011.

Parks (Seattle Department of Parks and Recreation). 2012. Personal communication with Cheryl Eastberg, SPU Parks Project Coordinator. Supplying park use data. July 12, 2012.

Paron, D.G. and E. Nelson. 2001. "Seward Park Rehabilitation Study: Juvenile Salmonids Use of Shoreline Habitats in Seward Park, King County, Washington." *Fiscal Year 2000, Planning Assistance to the States Report.* U.S. Corps of Engineers. January 2001

PSCAA (Puget Sound Clean Air Agency). 2009. "Air Quality Data Summary." Accessed April 2011.

Sammons, Kelli. 1970. Sammons to Robert H. Baker, memorandum re: Weekly Report, June 5, 1970. *Sherwood Collection*, 5801-01: Box 43, SMA.

SDOT (Seattle Department of Transportation). 2011. "Seattle Bicycling Guide Map 2011." http://www.seattle.gov/transportation/docs/2011BikeMap.pdf.

Seward Park Improvements. Undated and unattributed list of improvements at Seward Park dating from 1936, showing contractor, (presumed) date of contract, and amount.

Shannon & Wilson. 2011. "Geotechnical Report, Genesee and Henderson Combined Sewer Overflow Reduction Project, Henderson Basin 44 (Seward Park), Preliminary Design." September 16, 2011.

Sherwood, Donald. 1973. *Seward Park–History*. City of Seattle Parks and Recreation. http://www.seattle.gov/parks/history/SewardPk.pdf.

SPU (Seattle Public Utilities). 2006. "Seattle Public Utilities Outfall Evaluation Report: NPDES Permit Documentation." Prepared by Herrera Environmental Consultants. August 2006.

SPU (Seattle Public Utilities). 2007. "Background for a Seattle Public Utilities Odor Policy Re-Evaluation." February 2007.

SPU (Seattle Public Utilities). 2010. "Seattle Combined Sewer Overflow Supplemental Characterization Study." Prepared by Herrera Environmental Consultants. May 2010.

SPU (Seattle Public Utilities). 2011a. "Determination of Significance and Request for Comments on Scope of EIS." May 26, 2011. http://www.seattle.gov/util/groups/public/@spu/@usm/documents/webcontent/01_013108.pdf

SPU (Seattle Public Utilities). 2011b. "Scoping Report: Henderson Basin 44 CSO Reduction Project." August 2011.

SPU (Seattle Public Utilities). 2011c. "Henderson and Genesee CSO Reduction Feasibility Analysis Report." Prepared by HDR Engineering. June 2011.

Tabor, R. A., H. A. Gearns, C. M. McCoy, and S. Camacho. 2006. "Nearshore Habitat Use by Juvenile Chinook Salomon in Lentic Systems of the Lake Washington Basin." Annual Report 2003 and 2004, U.S. Fish and Wildlife Service, Western Washington Fish and Wildlife Office, Lacey, WA.

Talbert, Paul. 2011. *The History of Seward Park.* Friends of Seward Park. http://www.sewardpark.org/history.html.

Tate, Cassandra. 2010. "Seattle City Council Initiates Condemnation Process to Acquire Site for Future Seward Park on May 10, 1909." Historylink.org Essay 9563. September 5, 2010. http://www.historylink.org/index.cfm?DisplayPage=output.cfm&file_id=9563.

TRB (Transportation Research Board). 2000. *Highway Capacity Manual*.

Troost (Troost Geologic Consulting). 2011. "Geomorphology and Shoreline History of Lake Washington, Union Bay and Portage Bay," Technical Memorandum. August 2011.

U of W (University of Washington) and Ecology. 2008. "Sea Level Rise in the Coastal Waters of Washington State." January 2008.

Urban Forestry Services, Inc. 2011. "Seattle Public Utilities CSO Reduction – Seward Park Tree Inventory." Prepared by Urban Forestry Services, Inc. for HBB Landscape Architecture. June 29, 2011.

US Census. 2010. http://2010.census.gov/2010census/

USDOT (U.S. Department of Transportation). 2011. National Transportation Statistics. http://www.bts.gov/publications/national_transportation_statistics/html/table_04_23

US EIA (US Energy Information Administration). 2010. "Electricity Consumption by End Use in U.S. Households, 2001." http://www.eia.gov/emeu/reps/enduse/er01_us_tab1.html

USEPA (U.S. Environmental Protection Agency). 2008. "Guidance on Preparing Cumulative Effect Analyses." Washington, D.C. February 2008.

USEPA (U.S. Environmental Protection Agency). 2009. "Frequently Asked Questions about Global Warming and Climate Change: Back to Basics." April 2009.

USEPA (U.S. Environmental Protection Agency). 2011. "Emissions Factors & AP 42, Compilation of Air Pollutant Emission Factors." http://www.epa.gov/ttnchie1/ap42.

USEPA (U.S. Environmental Protection Agency). n.d. Data Finder. http://www.epa.gov/air/emissions/. Accessed June 30, 2011.

WDFW (Washington Department of Fish and Wildlife). 2009. *Washington Herp Atlas*. Washington Natural Heritage Program, U.S.D.I. Bureau of Land Management and US Forest Service http://www1.dnr.wa.gov/nhp/refdesk/herp/herpmain.html Accessed June 2011.

WDFW (Washington Department of Fish and Wildlife). 2011a. Priority Habitats and Species (PHS) on the Web. http://wdfw.wa.gov/mapping/phs/. Accessed June 2011.

WDFW (Washington Department of Fish and Wildlife). 2011b. "Priority Habitats and Species Report in the Vicinity of T24NR04E Section 23." July 28, 2011.

Waterman, T. T. 1922. "The Geographical Names Used by the Indians of the Pacific Coast." G*eographical Review* 12 (1922): 175-94.

Whittington, Dick. 1953. Seattle Parks Department, press release. *Sherwood Collection*, 5801-01: Box 43, SMA. May 24, 1953.

Wydoski, R.S. 1972. "Checklist of fishes in the Lake Washington Drainage." University of Washington, Seattle. Internal Report 34.