

Henderson North Combined Sewer Overflow (CSO) Project

CSO Facility 8A

Project Narrative for Master Use Permit Application



Location

The Henderson North CSO Reduction Project – CSO Facility 8A will be located in Basin 44 in Seward Park in southeast Seattle. Basin 44 is the geographic area that contributes combined sewer overflows (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 will be located in Seward Park (See Sheet 18 of 320: CSO Facility 8A – Site Plan, included with this application). Electrical service will extend a few feet into the South Juneau Street right-of-way.

The legal description for parcel 2324049007 (Seward Park) is:

GL 1 & 2 & SH LDS ADJ IN NE 1/4 SEC 23-24-04 ALL GL 3 & 4 & E 1024 FT GL 5 & SH LDS ADJ IN SE 1/4 SEC 23-24-04 GL 3 & SH LDS ADJ IN SE 1/4 SEC 14-24-04 GL 3 & SH LDS ADJ IN SW 1/4 SEC 24-24-04 & GL 1 & 2 & SH LDS ADJ IN NW 1/4 SEC 24-24-04 1/4 SEC 24-24-04 TGW POR NW 1/4 & SW 1/4 SEC 23-24-04 LY NELY OF LK WASH BOULEVARD S

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 will reduce the number and volume of raw sewage and untreated stormwater overflows to Lake Washington, which will help protect public health and improve water quality in the lake. The proposed project 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 per outfall.

Project Description

The project components include the following features:

- An underground, 2.65 million-gallon storage tank under the existing tennis courts.
- A new below grade facilities vault containing odor control, mechanical, electrical, and control systems.
- Above-grade features including an electrical cabinet; two heating, ventilation, and air conditioning (HVAC) intakes; two HVAC exhausts; one odor control exhaust; and an enclosure containing a reduced pressure backflow assembly associated with potable water used to flush the tank.
- Shoreline rehabilitation consisting of removal of the existing bulkhead and replacement with a bioengineered system and native landscaping.
- Construction of a pedestrian path between the tennis courts and the shoreline.

- Replacement of the existing CSO Outfall that extends approximately 680 feet into the lake.
- Stormwater improvements, and restoration of the tennis courts, parking area, and landscaping.

CSO Facility 8A Infrastructure

New CSO Storage Tank: A new, underground 2.65 MG CSO storage tank will be built in the southwest corner of Seward Park, next to Lake Washington. The CSO storage tank will be located under the existing tennis courts and an adjacent parking lot. The exterior dimensions of the tank will be approximately 315 feet long by 60 feet wide by 30 feet deep. The required capacity of the tank was determined based on computer modeling and monitoring data that predicted 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 per outfall.

Access to the tank will be through at grade hatches located between the two restored tennis courts. The size of the access hatches will range from approximately 2.5 feet square to 3 feet wide by 6 feet long (See Sheet 42 of 320: CSO Facility 8A – Tennis Court Plan, included with this application).

There are two areas northwest and in the middle of the proposed CSO storage tank that have National Park Service (NPS) Urban Parks and Recreation Recovery (UPARR) grant protections; the grant protections will be removed from both locations and transferred to an area along Lake Washington Boulevard north of 53rd Avenue South and 54th Avenue South, as part of this project (See Sheet 18 of 320: CSO Facility 8A – Site Plan, included with this application).

New Facilities Vault: An underground facilities vault attached to the northern end of the CSO storage tank will contain odor control, mechanical, electrical, and control systems. Access to the vault will be by hatches and stairs from ground level in the parking lot. The size of the access hatches will range from approximately 2.5 feet square to 4 feet wide by 14 feet long (See Sheet 18 of 320: CSO Facility 8A – Site Plan, included with this application). The exterior dimensions of the facilities vault will be approximately 33 feet long by 60 feet wide. The depth from ground level to the vault floor will be approximately 20 feet. There will be at-grade air plenums from the electrical room.

Shoring: Shoring will be required to construct the CSO storage tank and the facilities vault. Shoring will consist of secant piles and tiebacks. The tiebacks will extend underground into Seattle Parks and Recreation property west and southwest of the CSO storage tank and Lake Washington on the east side of the CSO storage tank (See Sheets 302 and 313 of 320: CSO Facility 8A – Shoring Site Plan, included with this application).

New Aboveground Features: An area approximately 50 feet long by 15 feet wide (750 square feet) will contain several aboveground features. The area with the aboveground features will be just west of the proposed facilities vault and will have the NPS UPARR grant protections removed from it. The aboveground features will include the following:

- Electrical cabinet: 2 feet long by 4 feet wide by 7.5 feet high.
- Heating, ventilation, and air conditioning air intake and air exhaust vents and odor control exhaust: The two heating, ventilation, and air conditioning (HVAC) air intake vents and two HVAC air exhaust vents each have been consolidated into single, at-grade structures located outside of the aboveground components area.

- Irrigation control cabinet: An irrigation control cabinet 1 foot long by 1 foot wide by 2.5 feet high.
- Motor actuator for storage tank isolation gate: A motor actuator within an enclosure box (3 feet long by 2.5 feet wide by 2 feet high) for the storage tank isolation gate.
- Motor actuator for Lakeline Control Gate: A motor actuator within an enclosure box (3 feet long by 2.5 feet wide by 2 feet high) for the Lakeline Control Gate.
- Gooseneck: An 8-inch-diameter odor control air duct gooseneck that comes aboveground and then back underground with no openings to the atmosphere. The gooseneck will be within an enclosure (1.5 feet long by 3 feet wide by 1 foot high).
- Meter cabinet: A Seattle City Light meter cabinet 5 feet long by 2 feet wide by 5 feet high.
- Reduced pressure backflow assembly: 2.5 feet long by 1 foot wide by 1.5 feet high.

Stormwater Improvements: Stormwater improvements consist of installing a French drain, bioretention planters, and replacement of a portion of the existing stormwater piping.

Parking Lot and Tennis Court Restoration: The existing tennis courts and parking lot will be demolished to accommodate the new CSO storage tank and facilities vault. The existing parking area has 28 stalls for the general public and 1 ADA Accessible stall. The restored parking lot will have 25 stalls for the general public, 2 ADA Accessible stalls, and 3 stalls for SPU maintenance vehicles. The tennis courts will be restored in a similar location to the current tennis courts. A pedestrian path will be installed between the tennis courts and Lake Washington. The existing pollution generating impervious surface (PGIS) is 11,013 square feet and the existing non-pollution generating impervious surface (NPGIS) is 15,856 square feet. The new plus replaced PGIS will be 8,111 square feet and the new plus replaced NPGIS will be 26,685 square feet. (See Sheets 17, 19-20 of 320: CSO Facility 8A – Site Preparation, Demolition and Pavement Removal; Site Grading and Paving; and Site Grading Sections, included with this application)

Tree Removal and Landscaping: The landscape plan has been developed in close coordination with Seattle Parks and Recreation who will maintain the project site when the project is completed. The project requires removal of approximately 40-45 trees; including a row of 23 Lombardy poplar trees between the existing tennis courts and Lake Washington (See Sheet 17 of 320: CSO Facility 8A – Site Preparation, Demolition, and Pavement Removal, included with this application). The landscape plan includes installation of 52 native deciduous and evergreen trees and approximately 2,400 native shrubs (See Sheets 48-51 of 320: CSO Facility 8A – Planting Plan Overview; Planting Plans; and Planting Schedule, included with this application). One tree was identified by a Certified Arborist as an exceptional tree under Seattle DPD Director's Rule 16-2008; however, this tree will be preserved and protected.

Shoreline Rehabilitation

This shoreline rehabilitation work will include removing the existing bulkhead adjacent to the tennis courts and constructing a new rounded-gravel beach, with native beach and upland species planted just shoreward and large woody material anchored just below the OHWM. Between the beach and the new CSO storage tank, a rockery wall will be installed to protect the tennis courts and CSO storage tank from wave action during storms. The total length of the shoreline rehabilitation work is approximately 360 feet extending from the existing outfall to a small rock groin near the southern end of the tennis courts. The base of the rockery wall will be above the OHWM and the wall will be approximately 4 feet high. In addition, the shoreline rehabilitation work will have the following key features (Sheets 44-46 of 320: CSO Facility 8A – Shoreline Enhancement and Shoreline Enhancement Sections, included with this application):

- *Habitat Enhancement:* The new shoreline will provide shallow water (less than one foot) and rounded gravel of equal or lesser size than the existing substrate. Cover would be provided for small fish by large woody material anchored just below the OHWM. Native vegetation would be included at the top of the rockery wall and overhanging the beach in plantable areas just shoreward of the large woody material.
- *Constructability:* Most of the work required for shoreline rehabilitation will take place above the OHWM with less than 300 cubic yards of rounded gravel beach fill to be added below the OHWM (18.8 foot elevation, NAVD 88 datum). The work required to construct the shoreline rehabilitation will be completed using either an excavator or clam shell located either on the top of the bank or staged from a shallow draft crane barge. The in-water work (below the OHWM) will be completed during the approved work windows. A silt curtain will be placed around any active in-water work areas and water quality monitoring will be conducted during placement of the round gravel beach fill to ensure compliance with water quality standards.
- *Shore Protection:* The new rockery wall would provide shore protection for the new tennis courts and CSO storage tank. Waves will not overtop the rockery wall during a 100-year storm event.
- *Aesthetics:* The proposed shoreline rehabilitation work will provide a natural looking shoreline including a rounded gravel beach and native vegetation, with some lake view areas from the top of the bank.

Replacement of the Existing CSO Outfall

The existing CSO outfall into Lake Washington is 24-inch-diameter wood stave pipe installed in 1932. A dive inspection in 2005 revealed that the reinforcing hoops for the wood staves have all failed and significant leaks were detected. The proposed outfall replacement will also be 24-inch-diameter pipe adjacent to the existing pipeline and terminating at approximately the same location.

The new outfall will be constructed of 24-inch inside diameter high density polyethylene (HDPE) pipe with attached bolted-on precast concrete anchors so that the pipe will sink to the lake bottom. The new pipe located approximately 15 feet north of the existing pipe will extend 680 feet waterward of the OHWM (Sheets 36-40 of 320: CSO Facility 8A Outfall Plan and Profile;

Outfall Sections; Outfall Anchor Details; and Outfall Terminal Details, included with this application).

- *Nearshore Section:* From the OHWM shoreline out to a depth of approximately 6 feet, steel sheet piling will be installed to limit the trench width. Steel Z-sheets will be driven with vibratory hammer. Soils will be excavated from within the trench and stockpiled for subsequent upland disposal. The sheeted trench will not be closed off at the waterward end or dewatered for construction. At the shoreline, the sheet pile driving and excavation by clamshell bucket will be conducted with a shore-based crane placed near the waters edge, or with an excavator reaching out from the shoreline. No shore-based equipment will operate in the lake. The rest of this sheeted nearshore section will be driven and excavated from a barge-mounted crane, with excavated material placed on a barge for subsequent disposal. The crane barge will be placed as near to shore as possible without grounding, and anchored using spud anchors. A standard 4 cubic yard clamshell bucket will be used for excavation. HDPE pipe with concrete anchors attached will be lowered into the excavated trench, then bedded and backfilled with clean crushed aggregate. The pipe joints will consist of flange connections bolted up by divers. The sheet piling will be withdrawn using the vibratory hammer. A final layer of WDFW “habitat mix” or other beach aggregate as required will be placed for the final layer.
- *Offshore Section:* From the end of the sheeted section to the outfall terminus at approximately 20 feet deep, trench excavation will be conducted with the barge-mounted crane with clamshell bucket. The pipeline will be partially buried in this zone, thus trench excavation depths are very shallow in this zone and thus no trench sheeting will be installed. Excavated material will be stockpiled and outfall installed and backfilled as described above. In addition to the bolt-on anchors, steel auger anchors will also be installed to anchor the end of the pipeline for additional hold-down and resistance to anchor damage. At the open-ended terminus of the pipe, a 20 feet by 24 feet energy dissipation pad will be installed to prevent scouring of the lake bottom. The pad will consist of cable-connected precast concrete blocks laid on the lake bottom.
- *Water Quality Controls:* Applicable conservation measures for in-water work identified in the Seattle Biological Evaluation (SBE) will be employed, including the following steps to meet water quality standards in the lake:
 - A 5-foot deep silt curtain will be placed around any active in-water work area
 - The clamshell dredge will be paused just above the water surface to allow partial dewatering before materials are transferred to the barge or onshore stockpiles
 - Dewatering water from the onshore or barge stockpiles will be monitored treated as necessary to meet receiving water quality standards
 - Water quality monitoring will be conducted during all excavation and backfilling to ensure compliance with water quality standards

Utility Extension onto Public Right-of-Way

Approximately 15 feet of underground electrical cable and conduit will extend to a new power pole approximately 15 feet beyond the Seward Park parcel onto South Juneau Street (approximately 10 feet west of existing SCL Pole 1364616). This new utility pole will support the overhead transformer bank that will serve the site.

Seattle City Light (SCL) will likely need to perform work on existing poles in the right-of-way by adding an additional cable to existing poles and adding a third distribution feeder to existing utility poles for approximately 8 overhead spans (approximately 1,000 feet along Seward Park Avenue South from Oakhurst Road South to South Juneau Street and along South Juneau Street). The addition of the third distribution feeder will affect the following poles: 1364658, 1364657, 1364656, 1364655, 1364654, 1364653, 1364617, and 1364616. It is anticipated that SCL will provide an overhead transformer bank on a new utility pole about 10 feet west of existing SCL Pole 1364616.

Construction Dewatering

It is anticipated that dewatering will be required during construction. Once the discharge water has been tested and meets clean water requirements, the clean water will enter a 6-inch-diameter discharge pipe. The discharge pipe will run above ground and terminate on the shoreline of Lake Washington below ordinary high water mark.

An approximate 4-foot by 4-foot sheet of plywood will be placed level with the invert of the discharge pipe. The plywood will be held in place by galvanized metal stakes at 1-foot on center. Two-inch by 4-inch boards will be attached to the plywood and act as energy dissipaters eliminating any erosion to the existing shoreline that could be caused by discharge of the dewatering water. No material will be removed during the installation of the energy dissipater. The energy dissipater will remain in place during construction and will be removed at the end of construction.

SEPA Compliance

SPU evaluated the Tennis Court Alternative in the Final Environmental Impact Statement (EIS) issued on January 3, 2013. The EIS was appealed and was reviewed by the Hearings Examiner on March 25, 2013. The EIS has been revised to better address long-term operation noise per the April 8, 2013 findings and decision by the Hearing Examiner during the appeals process. The revised Final EIS was issued September 5, 2013. An addendum to the Final EIS, Revised Final EIS, and Determination of Non-Significance was issued on September 30, 2013, to analyze design changes that would allow SPU to operate Henderson Basins 44 and 45 as a single system and increase the storage volume from 2.4 to 2.65 million gallons.