

DSN036-CON-1 (KC) or WDUW-Chelan-KC-CONV

Alternative DSN036-CON-1 controls King County's Chelan Ave CSOs by transferring flow to the Alki Treatment Facility. This alternative is an independent alternative and only controls King County CSOs.

Design Criteria

- King County Chelan Ave CSO Peak Flow Rate for Sizing Conveyance to Alki Treatment Facility: 25.7 MGD¹
- King County Harbor Ave CSO Peak Flow Rate for Sizing Conveyance to Alki Treatment Facility: 20.3 MGD

Description

Flows from the Chelan Ave CSO Basin would be diverted from the Delridge Trunk and routed to the Harbor Ave Regulator Station and Harbor CSO Pipeline. Combined Chelan Ave and Harbor Ave CSOs would be routed to the Alki Treatment Plant for treatment via the West Seattle Tunnel.

Alternative DSN036-CON-1 (KC) consists of conveyance improvements and upgrades to the 63rd Pump Station, Alki Treatment Facility, and outfall to control King County Chelan Ave CSOs.

The main components of this alternative would include:

- 46-MGD upgrade to 63rd Ave Pump Station.
- 46-MGD upgrade to Alki Treatment Facility
- Two new regulator stations (diversion structures) referred to as the Diversion Structure and Delridge Diversion Structure in Figure G.7-3.
- One drain structure to allow draining of the 36-inch-diameter pressure pipe after wet-weather events when not in use.
- Modifications to the Harbor Ave Regulator Station.
- Approximately 530 ft of 12-inch-diameter pipe to convey flows from Delridge Way SW to the new 36-inch-diameter pressure pipe located parallel to the Delridge Trunk (see Figure G.7-3 for proposed alignment).
- Approximately 3,270 ft of 36-inch-diameter pressure pipe to convey flows from the Delridge Diversion Structure to the Harbor Ave Regulator Station (see Figure G.7-3 for proposed alignment).
- Approximately 1,350 feet of 42-inch-diameter force main pipe to convey 46 MGD from 63rd Ave Pump Station to Alki Treatment Facility.
- Approximately 2,000 ft of 42-inch-diameter outfall pipe

¹ This alternative assumes that flows are diverted upstream of the Chelan Ave Regulator Station along the Delridge Trunk. It has not been confirmed by modeling that diverting from this location would control Chelan Ave CSOs. Refined modeling may indicate an increase in storage volume and conveyance size to control Chelan Ave CSOs.

63rd Ave Pump Station Upgrade

The existing 63rd Ave Pump Station, located at the intersection of SW Spokane St and Beach Dr SW, is rated for an existing pumping capacity of 65 MGD. The 63rd Ave Pump Station transfers flows above base sanitary flows to the Alki Treatment Facility via 24- and 42-inch-diameter force mains. This alternative requires that the pump station be upgraded for an additional 46 MGD to handle Harbor Ave and Chelan Ave CSOs conveyed via the West Seattle Tunnel. This alternative assumes that the pump station upgrades would require new pumps retrofitted within the wet well of the existing pump station, and additional property would not be acquired. A new 42-inch-diameter force main would be required to convey the additional flows to the Alki Treatment Facility.

Alki Treatment Facility Upgrade

Flows to the Alki Treatment Facility are pumped from 63rd Ave Pump Station to the Alki Treatment Facility located at the intersection of Benton Place SW and Beach Drive SW. The current treatment capacity is limited by the hydraulic capacity, which varies between approximately 45 MGD and 67 MGD depending on the tide level. Flows to the Alki Treatment Facility are routed through bar screens and parshall flumes, and then split between the six primary clarifiers. The six primary clarifiers provide settling of the solids, and flows are sent to the chlorine contact tank for disinfection prior to discharge. The primary sedimentation tanks were designed at a surface overflow rate of 3,950 gpd/sf at peak design flows of 65 MGD. This alternative requires that the capacity of the Alki Treatment Facility be increased by 46 MGD to treat Chelan Ave and Harbor Ave CSOs. Modifications to the headworks, primary clarifiers, and chlorine contact tank would be required to accommodate the additional flows. This alternative assumes that the upgrades will occur within the existing footprint of the Alki Treatment Facility, and additional property would not be acquired.

Treated CSO effluent from the Alki Treatment Facility would be conveyed via a new outfall to Puget Sound. For planning purposes, the new outfall would be approximately 2,000 feet long and 42 inches in diameter to match the capacity of the existing outfall.

Flow Diversion and Discharge

Three regulator stations, along with approximately 530 ft of 12-inch-diameter pipe and 3,270 ft of 36-inch-diameter pressure pipe, will be required to divert King County flows (Chelan Ave CSOs) from the Delridge Trunk and existing sanitary sewer on Delridge Way SW to the Harbor CSO Pipeline at the Harbor Ave Regulator Station during wet-weather events as shown in Figure G.7-3. A new drain structure will also be required on the pressure pipe near the intersection of the Delridge Trunk and SW Spokane St to allow the pressure pipe to be drained after a wet-weather event when not in use. Chelan Ave and Harbor Ave CSOs would then be conveyed to the West Seattle Tunnel via the existing Harbor CSO Pipeline. Diverted King County flow would discharge to the 63rd Ave Pump Station where flows would be conveyed to the Alki Treatment Facility.

Construction Assumptions

King County's Tabula cost estimating program was used to develop a Class 5 estimate for this alternative. The attached documentation lists the construction assumptions used.