

DSN031-STOR-1 (KC) or MEBI-Han-Rain-BV-KC-STOR 1

Alternative DSN031-STOR-1 (KC) controls King County's Hanford@Rainier and Bayview North CSOs by building a storage tank near the Bayview North Overflow Structure. This alternative is an independent alternative and only controls King County CSOs.

Design Criteria

- King County Storage Volume Requirement: 1.79 MG (Hanford@Rainier and Bayview North)
- King County CSO Peak Flow Rate for Sizing Conveyance from Hanford@Rainier Overflow Structure to Storage: 31.0 MGD (Hanford@Rainier CSOs)
- King County CSO Peak Flow Rate for Sizing Conveyance from Bayview North Overflow Structure to Storage: 55.5 MGD (Bayview North CSOs)
- Storage tank is required to drain within 12 hours of event.

Description

Alternative DSN031-STOR-1 (KC) consists of a storage tank to control King County Hanford@Rainier and Bayview North CSOs. A CSO control volume of approximately 1.79 MG is required to reduce overflows at the Hanford #1 CSO Outfall to an average of one untreated discharge per year at each outfall. Storage of this volume could be provided with an offline storage tank located within or adjacent to the approximate solid boundary shown in Figure G.4-1. The storage tank could be located anywhere between the Hanford@Rainier Overflow Structure and Bayview North Overflow Structure (indicated as dashed boundary in Figure G.4-1); however, conveyance would need to be re-evaluated if the storage tank moves from assumed location (solid boundary). See Section 6.1 Planning-Level Sizing Assumptions for criteria and assumptions used in establishing the approximate boundary.

The main components of this alternative would include:

- 1.79-MG offline storage tank with pumps to empty the storage tank.
- Facilities building(s) to house electrical/control/odor control equipment and a standby generator.
- Modifications to the Bayview North Overflow Structure and Hanford@Rainier Overflow Structure.
- Up to approximately 1,000 ft of 16-inch-diameter force main, depending on the location selected for the offline storage tank within or adjacent to the approximate solid boundary shown in Figure G.4-1.
- Up to approximately 2,010 ft of 48-inch-diameter influent gravity sewer to convey Bayview North CSOs from the Bayview North Overflow Structure to the storage tank, depending on the location selected for the offline storage tank within or adjacent to the approximate solid boundary shown in Figure G.4-1.
- Approximately 2,900 ft of 72-inch-diameter influent gravity sewer to convey Hanford@Rainier CSOs from the Hanford@Rainier Overflow Structure to the storage

tank, depending on the location selected for the offline storage tank within or adjacent to the approximate solid boundary shown in Figure G.4-1.

Storage Tank

The CSO control volume for King County could be stored in a buried, rectangular structure, approximately 200 feet long and 80 feet wide with a sidewater depth of approximately 20 feet.

Flows would enter the storage tank during a wet-weather event. The tank may be configured with multiple chambers, so that only those chambers required to store the volume of the wet-weather event would be used. Storage of flows would start in the first chamber and as that chamber fills and reaches capacity, flows would be transferred into subsequent chambers until either the wet-weather event ends or the capacity of the storage tank is reached. Each chamber would contain equipment for flushing and self-cleaning, and only chambers used in a wet-weather event would require flushing. Control of odors and sediment in the storage chambers may require regularly-scheduled cleaning between events.

Facilities Building(s)

Facilities building(s) would be located above or below ground level and would contain an odor control system, electrical controls, and a standby generator. The actual contents of the building(s) will be determined during preferred alternative development. The representative footprint shown in Figure G.4-1 for this alternative locates the facilities buildings adjacent to the storage tank for conservative purposes; however, the facilities buildings could be located above the storage tank to minimize space requirements.

Flow Diversion and Discharge

The storage tank is located in the vicinity of the Bayview North Overflow Structure and would store King County flow diverted from the Bayview North Overflow Structure and Hanford@Rainier Overflow Structure.

One regulator station will be required to divert King County flows (Bayview North CSOs) from the Bayview North Overflow Structure to the storage tank. For this planning phase, it is assumed that the diversion would occur just upstream of the Bayview North Overflow Structure.

Evaluation of whether flows can be diverted further upstream of the overflow structure will be completed during preferred alternative development. Diverted King County flow would discharge to the location of the storage tank via a 48-inch-diameter influent gravity sewer. The length of the influent gravity sewer will vary depending on the selected location of the offline storage tank, which will be evaluated during preferred alternative development. The influent gravity sewer can be up to 2,010 feet long based on the criteria and assumptions listed in Section 6.1.

An additional regulator station will be required to divert King County flows (Hanford@Rainier CSOs) from the Hanford@Rainier Overflow Structure to the storage tank. For this planning phase, it is assumed that the diversion would occur at the Hanford@Rainier Overflow Structure. Evaluation of whether flows can be diverted further upstream of the overflow structure will be completed during preferred alternative development. Diverted King County flow would discharge to the location of the storage tank via approximately 2,900 ft of 72-inch-diameter influent gravity sewer. A drop structure will be required at the upstream end of the influent gravity sewer, immediately adjacent to the Hanford@Rainier Overflow Structure. This drop

structure is required to lower the invert elevation of the influent gravity sewer, so that the water surface elevation at full flow in the sewer is lower than the existing overflow weir elevation in the overflow structure. This drop structure will allow the capacity of the new influent gravity sewer to be fully utilized.

After a wet-weather event, the chambers inside the storage tank would drain to a common sump. Submersible pump(s) would transfer stored sewage from the sump back into the King County Bayview Tunnel through a 16-inch-diameter force main that is up to approximately 1,000 feet in length. The length of the force main will vary depending on the selected location of the offline storage tank, which will be evaluated during preferred alternative development.

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.