Black River Pump Station Improvements

King County Flood Control District Advisory Committee

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Supervisor Capital Strike Team
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Department of Natural Resources and Parks
Water and Land Resources Division
River and Floodplain Management Section

Service provider to the King County Flood Control District
Black River Pump Station Location

- Duwamish
- Green River
- Cedar River
Black River Pump Station Location
Black River Pump Station Location

Black River

Duwamish

Green River
Black River Pump Station Location

Map showing the location of Black River, Duwamish River, and Green River.
Historic flooding

Looking north on HWY 167 toward Lake Washington
Looking north on HWY 167 toward Lake Washington

Modern View of historic Black River floodplain

This Google Earth rendering roughly matches the location of an oblique aerial photo showing flooding in the winter of 1984-85. The area has been heavily developed and now enjoys flood protection achieved by the Howard Hansen Dam, the Green River levee system, and the Black River Pump Station (near upper left).
Black River Pump Station

1971 construction

8 flood pumps

Dam prevents tidal and flood backflow in Renton

Vital outlet in case of upstream levee breach or overflow

Fish passage (2 way)

Pumps 1, 4, 6 & 8 running
Nominal discharge 1,250 cfs
February 27, 2014
Protection from Flood Inundation

• 0.2% Annual Exceedance Probability (aka 500-year flood)
  – Results in WSE of 27.5 feet (NAVD 88)

• $4.4 billion improvements inundated including:
  – 2,800 acres
  – 640 buildings,
  – FAA, KC Elections, Boeing, Ikea, Fred Meyer, Walmart
  – Portions of Renton, Kent and Tukwila
Cross-Section View
Controlled Inlet Pond at Left, Confined River Flooding at Right

Black River Inflow

Flood and Tidal stage

Water pumped over dam to prevent flooding of City of Renton
Pumps

• Very large diesel engines and electric motors power 8 large pumps

• Largest pumps only needed during extreme flood conditions

• Large pumps needed Dec 20-22, 2019 and Feb 9, 2020

• Total discharge capacity 2,945 cfs
Capital Needs

• Replace High-Use Pump Engines
• Replace Control Building
• Mechanical System Upgrades
• Fish Passage & Exclusion Improvements
• Seismic and Structural Retrofits
• Replace Large Pump Engines

• Implementation 2020-2027
Replace High-Use Pump Engines
Replace Control Building
Fish Passage & Exclusion Improvements

Denil (Alaska Steeppass) for Upstream Passage

Airlift for Downstream Passage
Seismic and Structural Retrofits
Replace Large Pump Engines
Questions?

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