

# CHEHALIS BASIN STRATEGY FLOOD RETENTION DAM SUMMARY OF COSTS AND LIFE OF DAM

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## Estimated Life of the Dam Facility

Dams have a history of good performance for well over 100 years. Design and construction techniques have improved such that dams can last for perhaps centuries. Factors that typically limit longevity of a dam, such as wear and tear on the dam and associated machinery due to typical uses, sediment wear on the concrete sluice surfaces and the stilling basin floor, and age/weathering issues, would be addressed through operations and maintenance (O&M) practices that extend the useful life of the dam. These costs have been included in the overall cost estimate for the dam facility.

Sedimentation in the reservoir has been raised as a concern that could limit the life of the dam. The flood retention flow augmentation (FRFA) facility has a 65,000 acre-foot permanent pool of water that could infill with sediment over time; however, the estimated average sediment load of 42 acre-feet per year is very small relative to the available dead storage. Over a 100-year period the dam would be about 6% full of sediment. The flood retention only (FRO) facility would pass most sediment through the dam, even sediment that has accumulated during flood retention operations when the tunnels through the dam are closed. Either reservoir facility would provide access to areas that could experience sedimentation and the FRFA facility could be drawn down to a level that allowed maintenance of the reservoir area if needed.

## Estimated Life of Fish Passage Facilities

The lifespans for various components of the fish passage facilities are:

- Capture, Handling, Transport, and Release (CHTR) Facility: 25 years
- Conventional Fishway: 50 years
- Floating Surface Forebay Collector (FSC): 30 years
- Fixed Multi-Port Forebay Collector (FMPC): 50 years

The cost for repair and rehabilitation of fish passage facilities is included in the total cost.

## Total Direct Project Cost Opinion (2016 Dollars)

The estimated construction costs for the FRFA and FRO facilities are listed in the following table along with the annual O&M costs.

ITEM	FRFA		FRO	
	LOWER COSTS	UPPER COSTS	LOWER COSTS	UPPER COSTS
Dam Facilities Construction <sup>1</sup>	\$293,000,000	\$453,700,000	\$201,200,000	\$318,900,000
Upstream Fish Passage: CHTR Facility	\$10,900,000	\$17,700,000	\$10,900,000	\$17,700,000
Downstream Fish Passage: FMPC Facility	\$83,600,000	\$135,900,000	\$0	\$0
Total Construction Costs	\$387,500,000	\$607,300,000	\$212,100,000	\$336,600,000
Annual O&M Costs	\$2,178,000	\$2,178,000	\$628,000	\$628,000

Note:

1. The dam costs include: a contingency range from 20% to 25%, design and site characterization factor of 7% to 9%, an engineering and construction management factor of 9% to 12%, and permitting of 3% to 6%.