Nookachamps Storage

The Nookachamps floodplain historically has provided various levels of natural storage, depending on the magnitude of the flood peak and shape of the hydrograph, to significantly reduce flood peaks. The HEC-RAS model results indicate that the 100-year flood peak flows would be reduced by approximately 22,000 cfs through the existing Nookachamps floodplain area (196,300 cfs at Sedro Woolley to 174,200 cfs at Riverside Bridge in Mount Vernon).

Additional flood peak flow reduction could be achieved if the Nookachamps floodplain storage were designed to function like a temporary flood control reservoir by storing during the peak flow period and releasing the stored water after the peak had passed. Implementation of this measure requires construction of levees and gate-control flow release structures that are available to control flows into and out of the reservoir area. Three levels of storage capacities at the Nookachamps area were evaluated.

Alternative 1   Nookachamps maximum flood storage of 81,000 acre-feet.

Alternative 2   Sterling and Francis Road flood storage of 73,000 acre-feet.

Alternative 3   Francis Road flood storage of 60,000 acre-feet.

The HEC-RAS model results demonstrate that a 100-year flood peak flow reduction of 20,000, 18,000, and 14,000 cfs could be achieved by the Nookachamps control storage Alternatives 1, 2, and 3, respectively. These flood peak flow reductions are in addition to the 22,000 cfs reduction provided by the natural Nookachamps floodplain storage. The total 100-year flood peak flow reductions would therefore be 42,000, 40,000 and 36,000 cfs for the Nookachamps control storage Alternatives 1, 2 and 3, respectively. The concurrent 100-year flood peak flows at Riverside Bridge in Mount Vernon would therefore be 154,000, 156,000, and 160,000 cfs respectively (assuming no levee failure and no levee overtopping).

Conceptual layouts of the levees and typical details of the control structures are shown on the attached drawings. Construction cost estimate summaries for each of the three alternatives evaluated are attached.

The cost estimates use Unit Costs as included in the R.S. Means Heavy Construction Cost Data, 2006. An adjustment has been applied to R.S. Means labor rates to bring them closer to current Washington Davis-Bacon rates. Refer to the Feasibility Cost Estimate Assumptions section for additional discussion of the assumptions and criteria used in developing the cost estimates.

Costs for permitting, engineering, owners administration, and Washington State Sales Tax that may be incurred are included in the Project Cost Summary. Costs of property acquisition and flood easements, if required, are not included.