

Project: Little Goose 1:40-scale Sectional Model

PI: Steve Wilhelms

Branch/Group: Inland Hydraulic Structures Branch, Environmental Hydraulics Group

Project Description/Activities/Capabilities:

The purpose of the Little Goose 1:40-scale section model was to define operational characteristics of the existing deflector and stilling basin and alternative deflector designs; define performance characteristics of a divider wall to separate powerhouse discharge from spillway discharge; and verify the minimum spillway flow and tailwater elevation associated with debris movement.

Sponsor: Walla Walla District. POC Sean Milligan.

Personnel: Steve Wilhelms, TEM Murphy, Laurin Yates, Calvin Buie

Project Location and Description:

Little Goose Dam is located on the Snake River at river mile 70.3. The powerhouse at Little Goose Dam consists of 6 hydroturbines with a combined capacity of over 120 kcfs and the spillway has a total width of 512 feet and consists of 8 radial gate-controlled bays 50 ft in width. 8-ft-long flow deflectors, with no transition radius, have been installed on spill bays 2 through 6 at elevation 532 ft. The flip bucket stilling basin is shorter (80 ft) and deeper (invert elevation 466.5 ft) than the horizontal apron-type stilling basins used at the other Snake River projects. The maximum depth of flow in the stilling basin is typically over 70 ft deep during normal tailwater conditions. A training wall extending over 100 ft from the north end of the powerhouse, separates the south side of the stilling basin from the powerhouse. A rock groin extends perpendicular to the dam at the north adult fish entrance. The tailwater channel below the powerhouse narrows quickly due to the presence of a peninsula containing fish passage facilities. The lock outlet is located about 500 ft downstream from the powerhouse on the south bank. The elevation of the tailwater channel downstream of the stilling basin ranges from 450 to 480 ft. A steep shelf 20-30 feet high extends across the tailwater channel 100 ft downstream of the stilling basin. The tailwater channel gradually becomes shallower downstream of the shelf ranging in elevation from 500 to 520 ft. The thalweg of the Snake River channel runs along the north bank of tailwater channel below the earthen embankment section of Little Goose Dam. The channel narrows considerably within one-mile of the dam resulting in a channel width of about 1350 ft at the location of the fixed monitoring station.

Facilities: Bldg. 5016

Related Topic Areas: Physical models, flow deflectors, dissolved gas, entrainment flow, debris movement, rivers, reservoirs, hydraulic structures, fish passage, surface water, hydropower

