B O N N E V I L L E P O W E R A D M I N I S T R A T I O N

factsheet

July 2008

Estimated costs of the Willamette BiOp

BACKGROUND

The Willamette Basin Project consists of 13 dams that were constructed between 1941 and 1969 and are operated by the Corps of Engineers (Corps). Most of these dams are "high head" dams that are over 250 feet tall.

The primary purpose of the dams is to prevent or reduce critical flood damage for the entire Willamette Valley including the cities of Eugene, Salem and Portland. Eight of the dams also have generating capability. The dams also provide recreational and fishing opportunities, water quality benefits, and municipal and irrigation water.

Power generation

The Willamette dams supply about 180 average megawatts (aMW) of energy annually – about two percent of the annual federal hydro generation in the Northwest. This is enough energy to service about half the load of a city the size of Eugene, Oregon.

Two of the dams are re-regulating dams that are dedicated to electricity production. In addition to the power, some of the facilities are operated as peaking plants that help the region meet its peak power demands.

Power share of fish costs

According to law, Bonneville Power Administration (BPA) ratepayers pay a portion of the fish costs at the multi-purpose dams in the Federal Columbia River Power System (FCRPS) based on the portion of the dam's purpose that is associated with power. On the Willamette, this ratepayer share ranges from 23 percent to 100 percent for the dams with generating capability.

The aggregate system power share for the Willamette Project is 48.5 percent. This is much lower than the BPA ratepayer share of the Columbia and Snake River dams, at about 80 percent.

FISH MEASURES IN THE BIOP

Water temperature

The July 2008 NOAA Fisheries' Biological Opinion for operation of the Willamette Project (BiOp) requires temperature control to be established at Detroit Dam unless research and evaluation finds that an alternative action or location should have higher priority.

The action agencies will use the Corps' Configuration and Operational Plan (COP) process to evaluate the best approaches to mitigate for the effects of the dams on water temperature in the river.

Initially, we'll be exploring operational changes, such as combining spill of warmer surface water with colder water being released from the power house to smooth out temperature fluctuations over the summer and fall.

We had some success managing temperature fluctuations in 2007 when a fire at the powerhouse at Detroit Dam resulted in both turbines being out of service, necessitating spill. Based on this success, in 2009 we will evaluate the feasibility of a similar operation at Detroit and possibly at Lookout Point.

We estimate that, on average, temperature control spill at Detroit and Lookout Point would result in a

loss of 8.9 aMW of generation.[1] Assuming about 60 percent of that generation is replaced by wind and conservation,[2] the greenhouse gas emissions from replacement power would be equivalent to the output of about 14,000 cars per year.

The operational changes will allow time for the agencies to evaluate longer-term structural improvements. These can be a more cost-effective means to address temperature control and still preserve the emissions-free generation from these dams.

The BiOp identifies Detroit Dam as the highest priority for temperature control, but it requires that the action agencies look at operation opportunities at other projects as well. The COP process will be the vehicle for identifying the biologically and technologically feasible and cost-effective solutions at each project. The BiOp requires that major operational changes or structural improvements for water temperature be implemented on at least one of the Project dams.

Each dam and reservoir is unique. Some dams may require the construction of a water temperature control tower. For other dams, a water temperature control device could be attached to the surface of the dam.

While structural improvements can be expensive, there are examples of these types of facilities that have been very effective both for temperature control and generation recovery. A temperature control device constructed on Shasta Dam in California in 1997 cost $80 million but alleviated the need for spill which was estimated to have cost $63 million over the previous decade. A water temperature control tower constructed at Cougar Dam on the McKenzie River in 2005 cost $52 million and has been effective in controlling the temperature for fish.

[1] This is the equivalent of about $3.25 million in power revenues, according to a Jan. 2008 BPA analysis.

[2] Based on the resource mix assumed in the Northwest Power and Conservation Council's Fifth Power Plan, Dec. 2004.

Fish passage structures

The BiOp specifies downstream passage at three projects – Cougar Dam, Lookout Point Dam and Detroit Dam – if technologically and biologically feasible and cost effective, unless it is determined through the COP process that an alternative action or location should have higher priority.

Compared with temperature control, technologies for fish passage structures at high head dams such as these are less well developed. Depending on what the COP identifies, costs could range widely and could be substantial.

For example, Portland General Electric and the Confederated Tribes of Warm Springs are constructing a downstream fish passage facility at Round Butte Dam near Madras, Ore., that they have estimated will cost $108 million.[3] PacifiCorp has estimated the cost of a downstream fish collection and transport facility at Swift Dam at $71 million.[4] The recently completed facility at Puget Sound Energy's Baker project reportedly cost $50 million.[5]

Hatchery improvements

The BiOp requires specific actions to upgrade fish collection facilities and make other hatchery improvements. There are established practices in these areas, and their benefits are documented, so costs are easier to estimate and predict. A general estimate at this point is $45 million. BPA's share of this cost would be $13 million.

In addition, BPA is funding the construction of a sorter/separator at Leaburg dam on the McKenzie River through the Northwest Power and Conservation Council's Program. The sorter /separator will mitigate for the action agencies' McKenzie Hatchery by separating hatchery chinook from natural origin chinook so that only natural origin fish get through to the high quality habitat above Leaburg Dam.

[3] Deschutespassage.com

[4] Final Environmental Impact Statement for Pacificorp's Federal Energy Regulatory Commission License for the Lewis River, 2006.

[5] Puget Sound Energy Fact Sheet

The estimated cost of building the sorter/separator is $10 million. Operation and maintenance of the facility will be incorporated into the ongoing McKenzie Hatchery operations.

Estimated costs to BPA ratepayers

It is difficult to accurately estimate the total cost to implement these measures given that specifics are still to be determined. Our best estimates at this time are that, in addition to the cost for replacement revenue related to spill for temperature management or temporary operation changes, the BPA ratepayer share of the cost to construct fish measures will be in the range of $80 to $120 million.

The majority of these costs are for capital improvements at the dams for fish passage and temperature. These structural modifications would be installed by the Corps with funds obtained through Congressional appropriations. BPA repays the U.S. Treasury for the power share of the total cost. The repayment begins when the structures are put into service and is amortized over a 50-year period.

The BiOp also includes a schedule that stages the implementation of these projects over time. This allows the agencies time to learn from earlier actions and apply that information to later actions.

As the Projects' electricity generation becomes more constrained and more costly, its power benefit diminishes. BPA will continue to assess the structural improvements to make sure that the cost to implement them does not overcome the value of the generation that the region gets from these projects. Should this occur, we may need to reassess the allocation of benefits among the Project purposes.