

Upper Columbia

UPDATE

THE NEWSLETTER OF THE UPPER COLUMBIA ALTERNATIVE FLOOD CONTROL AND FISH OPERATIONS ENVIRONMENTAL IMPACT STATEMENT (EIS)

ISSUE #5 — MAY 2004

Progress on studies to support Upper Columbia EIS

The Corps and Reclamation have initiated numerous studies to support evaluation of the potential impacts of different flood control and fish flow operations at Libby and Hungry Horse Dams. Studies range from analysis of potential local effects to the Kootenai and Flathead River systems, to system-wide evaluation of possible consequences all the way downstream to the lower Columbia River. The following list provides an update on the status of these various studies.

Hydro-Regulation Modeling of Alternative Dam Operations: Using computer models, the Corps and Reclamation have completed simulation of daily reservoir and river stages in the Kootenai, Flathead, and Clark Fork rivers, and Lake Pend Oreille. The computer simulations cover a full period of record of several decades. Final reports of the modeling efforts will be issued by May 2004. The hydro-regulation modeling allows evaluation of how different dam operations affect river and lake levels and flooding risk. In addition, the model results will form a key basis for the system-wide analysis of hydropower impacts, as well as evaluation of local effects such as agricultural seepage in the Kootenai Flats, modeling of the response of resident fish populations, and the cultural and historic resources analysis.

Hydropower Impact Analysis: The Corps' Northwestern Division (regional) office is modeling hydropower production of the entire Columbia basin (including

Canada) under different operational scenarios for Libby and Hungry Horse dams. Simulations will provide differences in monthly average power generation for the Columbia River system for the period 1948-1999. The hydropower modeling report will be done by August 2004 and the analysis of the economic impacts of changes in hydropower generation will be done by January 2005. The hydropower modeling will simulate monthly multi-purpose operations for Grand Coulee Dam to form the basis for the studies of socioeconomic, resident fish, contaminants and the cultural and historic resources along Lake Roosevelt and areas further downstream. It will also be used to update analysis of impacts and benefits of VARQ operation to anadromous fish (salmon and steelhead) in the lower Columbia.

Socioeconomic Analysis: The Corps and Reclamation are preparing a contract to study socioeconomic impacts of different dam operations (note that the economic impacts of changes in hydropower generation will be prepared separately by the Corps). The socioeconomic analysis will focus on areas within the Columbia basin with potential socioeconomic impacts from the different dam operations, as identified in scoping for the environmental impact statement (the final scoping document is available at <http://www.usbr.gov/pn/programs/VARQ/links.html>). A final report is scheduled by October 2004. Impacts in

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DEFINITIONS IN THIS ISSUE

Storage Reservation

Diagram (SRD): A graphic representation of how much storage space, in terms of water volume, needs to be reserved each month for flood control in a storage reservoir such as Libby or Hungry Horse. The storage reservation for each month is based on that month's seasonal inflow forecast.

Acre-foot: The volume of water that would cover one acre of land to a depth of one foot (equal to 43,560 cubic feet or 325,804 gallons). Used as a unit measure for water storage volume in reservoirs.

Remedial Investigation and Feasibility Study: According to the Superfund process, an investigation to determine the nature and extent of contamination, establish criteria for cleaning up the site, identify preliminary alternatives for cleanup actions, and support the technical and cost analyses of alternatives

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Canada will be addressed by Canadian agencies.

Resident Fish Modeling: The Seattle District Corps is preparing a contract to model impacts of different dam operations on reservoir and river fish populations in the Kootenai and Flathead basins. The study will also analyze the effects of dam operations on the aquatic ecosystem of the lower reaches of the Kootenai in British Columbia and Idaho. The study will be done by October 2004. Reclamation is also evaluating effects on resident fish associated with Lake Roosevelt. Canadian resource agencies are being enlisted to assist with evaluation of resident fish issues in Canada.

Anadromous Fish Analysis: System operation results derived from power modeling will be used to update the analysis of flow provisions for salmon and steelhead in the lower river, using target flows at selected locations in the Columbia for comparison.

Cultural and Historic Resources Analysis: Using the hydro-regulation model results, the Corps and Reclamation will evaluate potential impacts to cultural and historic resources in Lake Koochanusa, the Kootenai River, Hungry Horse Reservoir, and the Flathead River that may occur from changes in exposure, erosion, or other flow/stage related factors. Evaluation of potential cultural and historic resources along Lake Roosevelt will rely on simulations of Lake Roosevelt elevation in response to different Hungry Horse and Libby dam operations. The

cultural and historic resources evaluation will be part of the Upper Columbia EIS. **Kootenai Flats Agricultural Seepage Study:** The Corps continues work on simulation of groundwater conditions in Idaho's Kootenai Valley in response to different dam operations, leading to an analysis of the impacts of the different dam operations on agricultural production and economics. As part of this study, HDR, Inc., prepared a report for the Corps, dated August 2003, that describes farming practices in the valley, areas historically affected by seepage, historical crop impacts due to seepage, and correlations between seepage and crop impacts (available for downloading under Kootenai Flats Agricultural Seepage Study at http://www.nws.usace.army.mil/ers/doc_table.cfm). A separate report prepared by HDR, Inc., summarizes research on the impacts of waterlogging on crop production. The information in the HDR reports will be used to help quantify economic impacts from the groundwater conditions simulated by the groundwater model. A final report on the economic impacts to agriculture resulting from different dam operations is expected by October 2004.

Levee Erosion Analysis: Regular surveys of levee conditions since the mid-1990's in the Kootenai Flats area will provide a baseline for evaluation of potential impacts of changed dam operations on future levee conditions. The erosion evaluation will be part of the Upper Columbia EIS.

PUBLISHING INFORMATION

Upper Columbia Update is intended to inform the interested public about the progress of, and topics of interest pertaining to, the Upper Columbia Alternative Flood Control and Fish Operations Environmental Impact Statement, and to facilitate public participation during the course of the project.

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Variable end-of-December draft & early season forecast at Libby

A study to evaluate relaxing the December drawdown (draft) requirement at Libby Dam was recently completed by the U.S. Army Corps of Engineers, North Pacific Water Management Division. The study was conducted in response to requirements set forth in the December 2000 Biological Opinions (BiOps) of the National Marine Fisheries Service (NMFS) and the U.S. Fish and Wildlife Service (USFWS). Both BiOps require the Corps to develop and, if feasible, implement a revised storage reservation diagram (SRD) for Libby Reservoir that replaces the existing fixed draft of 2.0 million acre-feet (maf) with a variable draft for the 31 December target. This measure is intended to improve the likelihood of refill at Lake Koochanusa during low flow or drought years.

Based on the analyses performed for this study, the 31 December draft requirement at Libby can be relaxed in below-average water years under the VARQ flood control procedure. At the beginning of December, an early-season forecast procedure is used to estimate the expected seasonal runoff above Libby Dam. If this forecast is less than 88% of average, the end-of-December flood control draft can be reduced by 600,000 acre-feet, making the 31 December target pool elevation 2426.7 ft., rather than 2411.0 feet. On the other hand, if the forecast is greater than 94% of average, the pool must still be drafted the full 2.0

million acre-feet down to elevation 2411.0 ft. by the end of December. For forecasts between 88% and 94% of average, a partial reduction in flood control space is allowed.

Daily simulations with a hydro-regulation computer model for the Kootenai basin were performed to test the variable December draft procedure. For all years where the end-of-December draft reduction would apply, the simulations showed that Libby was still fully capable of meeting flood control storage requirements in subsequent months. Under these guidelines, the end-of-December draft reduction is expected to occur in about one out of four years.

The early-season forecast procedure is designed to provide a prediction of the seasonal water supply prior to the first of the year. The new early November and early December water supply forecasts will facilitate such operations as the variable end-of-December draft. The new procedure uses values of the Southern Oscillation Index (SOI) for the previous summer along with observed precipitation measurements during the fall. The SOI reflects ocean and atmospheric factors that are believed to have near-term influences on climate. Snowpack data are incorporated as the first snow measurements are made available in early January and are used to make a new January forecast. The new early-season water supply forecasts were used for the first time this fall.

NOW ON THE WEB

For the latest news and information on the UC project, go to

www.usbr.gov/pn/programs/VARQ/

Listed below are just a few of the informative articles and documents you'll find on the website:

- **Final Environmental Assessment for implementation of VARQ**
An assessment of the effects of implementing VARQ while the EIS is underway, done by the Corps of Engineers for Libby Dam.
- **Frequently Asked Questions**
Answers to a number of questions about the project covering technical issues, policy, background, & process.
- **Final Scoping Document**
The results of the initial scoping process of public and agency meetings, letters, and consultations, setting the scope for the EIS.

Plus links to:

- Agency websites
- Articles and reports on Columbia and Kootenai River dam and flood control operations
- Information on endangered species
- Alternative perspectives and viewpoints

Any Missing Links?

If there are any links you think would add to the information on our site, please submit them to: uceis@usace.army.mil

Thanks for your input!



Upper Columbia Water Supply Forecast

Each issue of the Upper Columbia Update includes updates of water supply forecasts, flood control target elevations based on those forecasts, and current reservoir elevations. The table summarizes the reservoir data for March 2004 and the April 1 volume forecast.

Prior to May 1, both Libby and Hungry Horse operate to meet both minimum flow requirements and end-of-month elevation requirements. In mid-April to early May, both projects switch to refill mode, with a goal of providing system and local flood control and refilling by the end of June or early July.

	Libby	Hungry Horse	Grand Coulee	The Dalles
April 1 volume forecast***	5.305 MAF*	1.474 MAF	52.5 MAF	73.4 MAF
Percent of average of forecast	84.9%	80.4%	87.0%	78.9%
End of April standard flood control target**	2404 FEET	3520 FEET	1283.3 FEET	
End of April VARQ flood control target**	2444 FEET	3550 FEET	1283.3 FEET	
Actual March 31 elevation**	2398.6 FEET	3514.7 FEET	1264.4 FEET	

* Million Acre Feet

** Elevation above sea level, measured at the dam

*** April-August (May-September for Hungry Horse)

What does VARQ implementation mean for 2004 operations?

Hungry Horse: Implementation of VARQ flood control will affect Hungry Horse lake levels this year. The volume forecast dropped to about 80% which is the range where the greatest differences between the VARQ and Standard flood control elevations occur. Minimum winter releases from Hungry Horse will be sufficient to maintain reservoir elevation below VARQ levels through the end of April. It is anticipated that no flood control releases will be needed in April to meet the May 1 flood control elevation for VARQ. It is very likely that Hungry Horse April 30 elevation will be below VARQ flood control. There would be April flood control releases for standard flood control.

There is a strong probability that Hungry Horse Reservoir will fill to elevation 3560 feet (full pool) this summer.

Libby: Libby Dam reached a slightly higher elevation at the end of February than it would have under Standard Flood Control. However, with the lower forecasts issued in March and April,

VARQ will not have any effect on Libby Dam outflows because the reservoir is below the elevation targets for both VARQ and Standard Flood Control. Libby will most likely be releasing its minimum flow until fish operations begin in the late spring.

This year Libby is required to meet sturgeon and bull trout flow requirements. Current projections indicate that there is only a fair probability that Libby Dam will fill to 2459 feet (full pool) this summer.

Grand Coulee: Implementation of VARQ flood control at Libby and Hungry Horse did not have an effect on Grand Coulee elevations this year. Libby and Hungry Horse elevations were dictated by minimum flows through March. The forecast dropped significantly between March and April due to an extremely warm March across the basin. With the drop in forecast Grand Coulee May 1 flood control requirements dropped to the minimum for both VARQ and Standard flood control.

LOOKING FOR MORE INFO?

Check out our website at

www.usbr.gov/pn/programs/VARQ

or see

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for

contact information

Will implementation of VARQ FC increase the potential for exposure to contaminated sediments in Lake Roosevelt?

Several studies in the late 1980s and 1990s have documented elevated concentrations of trace elements such as arsenic, cadmium, copper, lead, mercury, and zinc in the bed sediments and fish in Lake Roosevelt and the Upper Columbia River. Waste discharges from the Teck Cominco smelter in Trail, British Columbia, that occurred from the late 1800's until the mid-1990's are a notable source of the contamination.

In 1999, the Colville Confederated Tribes (CCT) petitioned United States Environmental Protection Agency (EPA) to investigate apparent and potential environmental and human health impacts due to contaminated sediments in Lake Roosevelt. The site was determined eligible for inclusion on the National Priorities List (NPL), which lists the most serious uncontrolled or abandoned hazardous waste sites in the U.S. identified for possible long-term cleanup under the Superfund program. EPA was unable to reach agreement with Teck Cominco on how environmental and human health concerns should be addressed, so for now EPA will use agency funds to proceed with a Remedial Investigation and Feasibility Study (RI/FS). EPA has chosen to not include the site on the NPL at this time.

Reservoir operations and contamination exposure: From about January through April each year, the water level of Lake Roosevelt is drawn down as much as 82 feet for flood control and power production requirements. The extent of the drawdown varies considerably each year, and is determined by such factors as the forecasted volume runoff and power demand in the winter leading up to the start of the snowmelt season. Depending on the extent of the

drawdown, large areas of shoreline and flats containing contaminated sediments can be exposed. When the exposed sediments dry, the fine-grained material can become airborne and be transported by prevailing winds. Increased amounts of exposed shoreline exacerbate the potential for air dispersion of contaminants during these wind events.

In the preliminary Assessment Report completed in 2001, the EPA stated "...additional concerns include potential threats to human health posed by contact with slag on beaches of the upper Columbia River and contact with contaminated sediments exposed during low draw down periods. Routes of human exposure to slag and contaminated sediments include inhalation of airborne particles, dermal contact, and ingestion." This conclusion represents a growing concern over the potential threat of airborne contaminants to human health.

To address these concerns, the US Geological Survey, in cooperation with the CCT, Lake Roosevelt Water-Quality Council, the Bureau of Reclamation, and the National Park Service initiated a study to assess the contributions from trace elements in exposed bed sediments to elemental concentrations of airborne particles measured during ambient and high-wind conditions. So far, the results of the air study have been inconclusive.

What does this all mean to VARQ flood control (FC)? Under VARQ FC, Grand Coulee Dam would continue to be operated to meet the project purposes of flood control, power generation, and irrigation. Preliminary evaluation indicates that VARQ FC would generally result in higher Grand Coulee releases

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and slightly lower Lake Roosevelt pool levels in spring prior to the start of the snowmelt season during near-average water years. It's important to note that power needs and flow augmentation for endangered species can have greater impacts on winter and spring reservoir operations than flood control, particularly for dry years. Compared to pre-VARQ operations, the greatest differences in drawdown under VARQ FC occur in the range of lake elevations between 1255 feet and 1270 feet. Additional modeling that will be available by this summer will provide more details on how VARQ FC affects Grand Coulee operations (see story on status of studies).

Conclusions: It has been demonstrated through past studies that contaminated bed sediments are exposed during periods of drawdown. Ongoing studies are being conducted to determine the potential for adverse affects associated with inhalation,

ingestion, and direct contact of these sediments under normal reservoir operations.

Implementation of VARQ FC would introduce a low probability of additional drawdown over that of standard operating conditions. Along with this additional drawdown, more acres of beach and sediment would likely be exposed.

To fully understand the effect of implementing VARQ FC, however, we must first understand the effect of normal reservoir operations associated with the contaminated bed sediments and their potential impact on human health. EPA will be implementing the RI/FS phase of the Superfund action at Lake Roosevelt. The information gathered from this process, as well as the on-going air monitoring study, will help us to better address these issues in the future and in the Upper Columbia EIS.



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