

**OREGON DEPT ENVIRONMENTAL QUALITY
WASHINGTON DEPARTMENT OF ECOLOGY
COLUMBIA RIVER INTER-TRIBAL FISH COMMISSION**

SYSTEM OPERATIONAL REQUEST: 2000-1

TO: Brigadier General Strock COE-NWD
William Branch COE-NWD-NP-Water Management
Cindy Henriksen COE-NWD-NP-WM-RCC
Rudd Turner COE-NWD-NP-WM-RCC
Doug Arndt COE-NWD-Portland
Lt. Col. R. Slusar COE-NWD-Portland
Lt. Col. W.E. Bulen, Jr. COE-NWD-Walla Walla
J. William McDonald USBR (Boise)– Regional Administrator
Judith Johansen BPA Administrator
Greg Delwiche BPA-PG-5
Robyn MacKay BPA-PGPO

FROM: Russell Harding, Oregon DEQ, Chris Maynard, Washington DOE,
 Bob Heinith , CRITFC

DATE: July 17, 2000

SUBJECT: **McNary Dam Test Operations to Reduce Temperatures
 in the Juvenile Bypass System**

Requested Operation:

Immediately institute an operations test to reduce temperatures in the McNary screened bypass facility. Cease operation of turbine units 1 and 2 from 10:00 AM to 12:00 AM daily to reduce the intake of excessively warm forebay water that exceeds water temperature standards through the units from entering the screened bypass system. Continue this operation until a full evaluation of temperature changes in the system has been completed.

Justification:

The temperature in the gatewells of turbine units 1-4 exceeded the water quality standard of 68 degrees F (20 degrees C) on July 10-13, 2000. Thermal gradients between the collection channel and the gatewells of these units averaged 2.13 degrees F with a range of 0.8-4.0 degrees F higher in the gatewells for those four days (WDFW McNary Temperature Report # 4). Monitoring of temperatures in the McNary screened bypass system by WDFW staff indicates that operation of units 1 and 2 during late morning, afternoon and early nighttime hours causes selective influx of warm water into the screened bypass system. Tests conducted in 1998 by the Corps and WDFW indicate that shutting down units 1 and 2 resulted in a significant reduction of temperature in the entire screen system of 1-3 degrees F (P. Hoffarth WDFW 1999 personal communication).

System sample direct mortality for juvenile salmon increased from 0.3 to 2.6 % over the July 10-13 period, consistent with increases in temperature gradients between the gatewells and collection

channel (WDFW McNary Temperature Report #4).

In 1999, the water quality agencies and CRITFC requested the operators to conduct this test, but it was not implemented. National Weather Service projections indicate that air temperatures in the McNary Dam area will continue to remain in the 90 degree F range for the next week. These conditions are conducive to conduct the operations test.

It is anticipated that this test will provide important information to help reduce system temperatures for juvenile and adult chinook salmon and adult steelhead that fall back through the screen system. The present Washington State temperature standard for temperature in the lower Columbia is 68 degrees F (20 C). However, according to recent research, lower temperatures in terms of seven day averages for different life stages will provide better protection for rearing juvenile chinook (62.5 F) and migrating adult salmon (59-62.5 F). Based upon study operations in 1998, shutting down units 1 and 2 will reduce the screened bypass system temperatures to reduce salmon exposure to warm water temperatures that directly or indirectly cause disease, parasitism, loss of limited energy reserves, loss of gamete viability, stress and mortality.

The McNary subgroup of the Water Quality Team suggested temperature criteria of 66 degrees F would trigger these recommended test operations. Temperatures in the gatewells of units 1 and 2 have exceeded the criteria established by this group.

References

- DOE (Washington Department of Ecology). 1999. Evaluating standards for protecting aquatic life in Washington's surface water quality standards. Temperature Criteria. Draft discussion paper. Department of Ecology. Olympia, Washington.
- Hoffarth, P. Fisheries Biologist, Washington Department of Fish and Wildlife. McNary Dam Program. July 9, 1999. Presentation to Water Quality Team.
- ISAB, 1999. Review of the U.S. Army Corps of Engineers' Capital Construction Program. Report 99-2. Part III. Adult Passage. Northwest Power Planning Council. Portland, Oregon.
- ISG (Independent Scientific Group). 1996. *Return to the River*. Northwest Power Planning Council. Portland, Oregon.
- Lichatowich, J., and S. Cramer. 1979. Parameter selection and sample sizes in studies of anadromous salmonids. Report 80-1. Contract DACW-57-77-C-0027 to Army Corps of Engineers. By Oregon Department of Fish and Wildlife. Portland, Oregon.
- WDFW. 1998-2000. Weekly monitoring and temperature reports at McNary Dam. Umatilla, Oregon and Olympia, Washington.
- Wagner, P. and T. Hillson. 1993. 1991 Evaluation of adult fallback through the McNary Dam juvenile bypass system. Contract DACW68-82-C-0077. To the Walla Walla District, Corps of Engineers. By Washington Department of Fish and Wildlife. Olympia, Washington.

