

July 29, 2008

Jennifer Watts
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State Water Resources Control Board
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Subject: Responses to State Water Resources Control Board Letter of July 3, 2008 on Data Information Requests Pertaining to the Klamath Hydroelectric Project

Dear Ms. Watts:

PacifiCorp Energy thanks the State Water Resources Control Board (State Water Board) for your letter dated July 3, 2008, regarding additional data information requests to support a California Environmental Quality Act (CEQA) analysis of PacifiCorp's application for 401 water quality certification of the Klamath Hydroelectric Project (Project). As you are aware, PacifiCorp has withdrawn the 401 application and therefore the CEQA process is no longer active and our expectation is that no work is currently being done by the CEQA consultants. Nevertheless, this letter provides information in responses to the four additional information requests in your July 3 letter. At the appropriate time we can discuss the need for additional information that is not currently in the record, and how that information should be developed if necessary.

State Water Board Information Request

Your July 3 letter indicates that a potential data "gap" is the analysis of sediment and sediment composition in Copco and Iron Gate reservoirs. Specifically, you indicate that sediment information is needed "to provide analyses for a standard set of metals, nitrogen species, and phosphorous species and to support analysis of nutrient cycling in the impoundments, and of potential water quality effects of dam removal".

PacifiCorp Response

During Project relicensing studies, PacifiCorp obtained data and information related to sediment and sediment composition in Copco and Iron Gate reservoirs as follows:

- Bathymetry and sediment classification for the Project reservoirs. PacifiCorp collected bathymetric data from Copco and Iron Gate reservoirs in the fall of 2001 using SONAR/DGPS equipment. Sediment cores were collected in specific locations of each reservoir to determine the size distribution of materials transported to the reservoirs. Sediment samples also were analyzed for percent water, total phosphorus, carbon, and nitrogen. This information is described in chapter 6 of the Water Resources Final Technical Report (FTR) at <http://www.pacificorp.com/Article/Article35437.html>.

- Determination of Sediment Oxygen Demand (SOD) in Project reservoirs. In 2002, PacifiCorp conducted a study to determine SOD rates for the Project reservoirs. Sediment cores from sites in the Project reservoirs were collected to measure, in the laboratory, the rate of consumption of oxygen from the overlying water and the rate of release of nutrients (i.e., orthophosphate, nitrate, ammonia) and other constituents (e.g., iron, manganese, sulfur) from the sediment to the overlying water. The information gathered through this work was used to specify the SOD and sediment nutrient release rates used in PacifiCorp's water quality models. This information is described in chapter 9 of the Water Resources FTR at <http://www.pacificorp.com/Article/Article35437.html>.

In addition, other entities have collected data and information related to sediment and sediment composition in Copco and Iron Gate reservoirs, including:

- California Coastal Conservancy (CCC) Klamath River sediment investigation. In 2006, CCC conducted a sediment investigation of Project reservoirs based on sediment samples taken by Shannon and Wilson, Inc. under a contract with the Coastal Conservancy. A report was produced by Gathard Engineering Consulting (GEC) under a contract with the Coastal Conservancy that provides a summary of the analysis of sediment volume, a description of sediment chemistry and grain size distribution, and a preliminary estimate of the volume and type of sediment that would be eroded by dam removal. The information is described in a November 2006 report by GEC that can be found at <http://www.fws.gov/yreka/KRI/GECFinalReport.pdf>.

State Water Board Information Request

Your July 3 letter indicates that a potential data “gap” is a bioassay of the effects of the algal toxin microcystin on anadromous fish, including studies that “would preferably analyze fish tissue and liver concentrations, and the serum level of stress hormones”.

PacifiCorp Response

Recently, EPA, the State Water Board, and PacifiCorp have collected data and information regarding possible microcystin concentrations in fish tissue and liver, and mussels in the Klamath Basin. The EPA and State Water Board data and information are summarized in a memorandum by Kann (2008)¹ prepared for the Karuk Tribe. PacifiCorp subsequently submitted a letter to California Environmental Protection Agency's Office of Environmental Health Hazard Assessment (OEHHA) in May 2008 that included: (1) comments on the Kann (2008) memorandum; and (2) recent results of microcystin in anadromous fish tissues collected by PacifiCorp. PacifiCorp's letter recommended that OEHHA review the information provided in the letter to evaluate whether a Fish Consumption Advisory with Safe Eating Guidelines may be needed for Iron Gate and Copco reservoirs and the Klamath River².

The tissue samples for microcystin analysis collected by PacifiCorp were taken from Chinook salmon and steelhead in October 2007. The samples included liver and muscle tissues from four Chinook salmon and two steelhead specimens collected from the Klamath River near Klamath Glen (about RM 5.7), one steelhead specimen from the Klamath River near Somes Bar (about

¹ Kann, J. 2008. Technical Memorandum. Microcystin Accumulation in Klamath River Fish and Freshwater Mussel Tissue: Preliminary 2007 Results. Prepared for the Karuk Tribe of California. April 2008.

² On June 10, 2008, OEHHA provided general guidance on the application of the provisional tolerable daily intake (TDI) of microcystin-LR (MC-LR) of 0.04 µg/kg/day derived from World Health Organization guidance values based on the WHO (1999) document titled “Toxic Cyanobacteria in Water – A Guide to Public Health Consequences, Monitoring and Management” (E & FN Spon, London).

RM 65), and one Chinook salmon specimen from the Klamath River near Seiad Valley (about RM 129). The samples also included liver and muscle tissues from six Chinook salmon and five steelhead specimens collected from the Iron Gate Hatchery.

The PacifiCorp samples are being analyzed by the laboratory of Dr. Greg Boyer at the State University of New York (SUNY) in Syracuse, which employs a state-of-the-art method for analysis of microcystins in fish tissues. The SUNY laboratory recently reported to PacifiCorp that all samples were non-detect for un-bound or “free” microcystin (see attached results). These results indicate that these fish pose no risk to human health from ingestion. Results from the laboratory of bound (non-toxic) microcystin in the samples are still pending. PacifiCorp plans to issue a report on these samples following completion of the laboratory analysis.

Another source of information includes tissue samples collected from Chinook salmon and steelhead in the Klamath River by the Yurok Tribe in September and October 2005 as reported in Fetcho (2007)³. The Chinook salmon samples included three liver tissue samples and two filet samples from the Klamath River below Weitchpec (about RM 42.5), and two liver tissue samples and two filet samples from the Iron Gate Hatchery. All Chinook salmon tissue samples were non-detect for microcystin. The steelhead samples included two liver tissue samples and two filet samples from the Klamath River at Weitchpec (about RM 43.5). The steelhead filet samples were non-detect for microcystin. Small amounts of microcystin were reported for the two steelhead liver samples (i.e., “trace” and 0.54 ng/g, respectively). The results indicate no risk to human health from ingestion of these fish. The Fetcho (2007) report can be obtained at: http://www.klamathwaterquality.com/Yurok_Fetcho_2006.pdf.

State Water Board Information Request

Your July 3 letter indicates that a potential data “gap” is a study to address the impact that fish exposure to microcystin has on susceptibility to infection by the parasites *Ceratomyxa shasta* and *Parvicapsula minibicornis*”.

PacifiCorp Response

PacifiCorp funded fish disease research by Oregon State University (OSU) during Project relicensing to: (1) assess the relative fish disease infection rates at selected river and reservoir locations; (2) determine habitat preference and abundance by habitat of the *C. shasta* polychaete host *Manayunkia speciosa*; and (3) determine the relative abundance of the *C. shasta* parasite at selected river and reservoir locations. The results of this research are described in a report located on PacifiCorp’s relicensing website at <http://www.pacificorp.com/Article/Article44092.html>.

In addition, OSU and the U.S. Fish and Wildlife Service (USFWS) have conducted research on myxosporean parasites in the Klamath Basin for several years with the assistance of the Karuk and Yurok tribes. This work is published on the USFWS, Arcata Office website at <http://www.fws.gov/arcata/fisheries/projectUpdates.html>.

State Water Board Information Request

³ Fetcho, K. 2006. Klamath River Blue-Green Algae Bloom Report. Water Year 2005. Prepared for the Yurok Tribe Environmental Program. January 2006.

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Your July 3 letter indicates that a potential data "gap" is information regarding parasite concentrations of *Ceratomyxa shasta* and *Parvicapsula minibicomis* directly below Iron Gate dam, at Bogus Creek, at Shasta River, and at points on the mainstem Klamath between Iron Gate dam and the confluence with the Shasta River.

PacifiCorp Response

For this request, PacifiCorp recommends that the State Water Board review the same information as described in the previous response.

If you have any question or comments regarding the above responses, please contact me at (503) 813-6011 or by email (cory.scott@pacificorp.com). Again, our thanks for the State Water Board's comments and interest in our application for water quality certification.

Sincerely,

PacifiCorp Energy



Cory Scott
Relicensing Project Manager

Cc: Kimberly D. Bose (FERC)
Robert Donlan (Ellison, Schneider & Harris)
Linda Prendergast (PacifiCorp)