June 14, 2018

Memorandum -- delivered via email

To: Chris Walker, NWP Operations Division Fishery Section
US Army Corps of Engineers (Corps)

From: Anne Mullan, Endangered Species Biologist, Willamette Branch
West Coast Region, National Marine Fisheries Service (NMFS)

Subject: NMFS' comments on Update to 18DET01 MFR "Temperature Operations Delay Due to Algal Bloom"

Thank you for this opportunity to review the Memorandum for the Record (MFR) Update. This memo summarizes comments prepared by NMFS' West Coast Region technical staff, in response to the Corps agreement to the City of Salem request to further delay spill from higher elevations mixed with turbine outflow until after June 21, 2018, and later to gradually increase spill as part of the releases downstream of the Detroit Reservoir and Big Cliff Re-regulating Dam. This spill provides temperature operations protecting Endangered Species Act listed steelhead and Chinook. We understand the need for caution in analyzing pathways for cyanotoxins entering the water supplies. As stated in response to earlier delays, we hope that once spill is an option, the elevations in Detroit Reservoir will allow for these beneficial temperature operations in the remaining summer months, along with releases through regulating outlets (RO) during fall months.

As noted before, the currently cooler water released from lower reservoir elevations can cause delays in upstream migration of spring Chinook spawners, and longer incubation for winter steelhead redds. It will later lead to a longer period of warmer temperatures affecting incubating Chinook salmon eggs, possibly as high as 60F which can cause death with prolonged exposure. More certainly it will shorten Chinook incubation by reducing the number of days until a threshold for accumulated temperature units (ATU) is reached, at which point eggs hatch, well before they would normally. The habitat conditions at that time may provide fewer food sources, and likely higher flows so that the alevins are unable to rear successfully before leaving their natal reaches.

We understand that the City of Salem is investing in ELISA biochemistry assay equipment so that they can test samples from the Detroit Reservoir and the North Santiam River 'in-house' to aid their decisions regarding water treatment at their Geren Island facility. It is helpful to have better timing of assay results relative to flows reaching the facility, so they will have more options for response and will be better able to continue to test on site samples. We also appreciate the City's efforts to find new treatment for the cyanotoxins, although this may take longer than the requested delay in spill operations. Should this be the case, we hope that there are steps to allow conservative use of the water designated as safe to provide enough time to bring the activated carbon treatment online. In the future, real time monitoring of chlorophyll could provide an earlier warning system.

We recognize that the warm water remaining could be evacuated at higher temperatures than requested and provided during 2017, and if so, could remove some of the remaining warm water prior

to September. We request that the Corps use the ROs, when possible, to increase the probability of achieving temperature targets, once the elevation has dropped to allow safe use.

We appreciate receiving the temperature analysis prepared by Norm Buccola, Corps (spreadsheet received June 12, 2018) and if further modeling is available, request those results as well. Also, as spill is gradually introduced, please provide the schedule and mix of spill to generation. Lastly, we appreciate the cooperation of all involved at this time, and look forward to improved risk management of water quality and fish survival. In the future, the selective water structure at Detroit, now in design, will improve the likelihood that temperature targets can be achieved.

Please direct questions or concerns about these comments to Anne Mullan at anne.mullan@noaa.gov or 503-231-2367 or Diana Dishman at diana.dishman@noaa.gov or 503-736-4466.

cc: Kathryn Tackley, Norm Buccola, Yamen Hoque, Greg Taylor, Salina Hart, Mary K Scullion, Corps
Marc Liverman, Anne Mullan, Diana Dishman, NMFS-WCR