



United States Department of the Interior



BUREAU OF RECLAMATION
Klamath Basin Area Office
6600 Washburn Way
Klamath Falls, OR 97603-9365

IN REPLY REFER TO:

KO-100
2.2.4.21 (WTR-4.10)

MAR 1 2021

VIA ELECTRONIC MAIL ONLY

Thomas M. Byler, Director
Oregon Water Resources Department
725 Summer St. NE, Suite A
Salem, OR 97301

Subject: Supplemental Response to Petition for Reconsideration of Final Order – Measuring Devices

Dear Mr. Byler:

This letter is to acknowledge the Oregon Water Resources Department's (OWRD) letter, dated February 23, 2021, *Notice of Reconsideration of Final Order – Measuring Devices in The Matter of an Investigation in Aid of Distribution Pursuant to ORS 540.210*, as well as to supplement the Bureau of Reclamation's (Reclamation) Petition for Reconsideration, dated December 30, 2020, of OWRD's *Final Order – Measuring Devices*, dated November 5, 2020 (Final Order). This letter also addresses matters raised by OWRD's separate *Determination on Status of Releases from Upper Klamath Lake through the Link River Dam*, dated January 22, 2021 (Determination No. 1) and February 23, 2021 (Determination No. 2).

OWRD's Final Order directs Reclamation, in consultation with OWRD, to install, operate, and maintain appropriate measuring devices on Sevenmile Creek, Thomason Creek, Fourmile Creek, and Crystal Creek, tributaries to Upper Klamath Lake.

In response to the Final Order, Reclamation and OWRD staff made site visits to potential gaging sites on December 8 and 15, 2020. These discussions continued via phone and email during January and February 2021. A number of technical challenges were identified with establishing accurate and reliable gages on the identified tributaries, including backwater conditions, wind driven currents, aquatic vegetation, and unstable bank conditions.

Before addressing the technical issues and Reclamation's tentative plans with respect to additional gaging, Reclamation maintains the position that the most appropriate manner for determining and quantifying storage operations in Upper Klamath Lake is the "net inflow" methodology Reclamation currently employs. Net inflow is preferable because it relies upon the most direct and measurable component of storage – water surface elevation. When Upper Klamath Lake's water surface elevation is increasing, water is being stored; when it is decreasing, stored water is being released, diverted, and/or evaporating. This methodology also accounts for releases through Link River Dam, the associated power canals, and the A Canal, as accurate and reliable measuring devices exist at these locations. Other ungaged diversions and losses, such as evaporation and groundwater inflow/seepage, are indirectly accounted for in this methodology, based on the measured change in lake water surface elevation.

INTERIOR REGION 10 • CALIFORNIA–GREAT BASIN

CALIFORNIA*, NEVADA*, OREGON*

* PARTIAL

OWRD appears to have recently altered its methodology for determining and quantifying storage operations in Upper Klamath Lake, as demonstrated in Determination No. 2. Compared to Determination No. 1, OWRD now includes measured flows in the Sevenmile Canal at Dike Road (U.S. Geological Service (USGS) gage no. 11504290) as part of the cumulative gaged inflow into Upper Klamath Lake. OWRD also now includes ungaged surface water inflows and direct precipitation in determining inflows to the lake. For quantifying outflows, OWRD has also incorporated ungaged diversions and evaporation directly from the lake.

Reclamation agrees that these inputs and outputs are all appropriate components to consider in evaluating storage operations in Upper Klamath Lake – components which are inherently included in Reclamation’s net inflow methodology. OWRD’s approach differs in that it attempts to assign an estimated value to groundwater inflow, ungaged surface water inflow, evaporation, and ungaged diversions, rather than using the lake’s water surface elevations as a way to “net” these various inputs and outputs. In short, OWRD’s approach relies upon estimates, rather than direct measurements.

Reclamation further observes that OWRD is deducting evaporative losses from water previously stored in the lake, rather than factoring these losses into the amount of inflow potentially available to store. The United States reserves the right to maintain that evaporative losses should be accounted for in a different manner, in terms of determining storage operations in Upper Klamath Lake. Reclamation would note, however, that Upper Klamath Lake is a natural waterbody, for which the water surface area has not been materially increased through Reclamation’s storage operations.

Reclamation also maintains, as previously communicated, that OWRD is mistaken in its interpretation of the Amended and Corrected Findings of Fact and Order of Determination (ACFFOD), dated February 28, 2014, in assuming it limits the volume of water that can be stored in Upper Klamath Lake annually as 486,828 acre-feet. This figure was the estimated storage capacity between water surface elevations of 4,136.0 feet and 4,143.3 feet (USBR datum), based on 1997 lake bathymetric data that has since been improved. As the ACCFOD states:

The evidence supports a right to store water in Upper Klamath Lake year around... The United States has historically stored water and Project irrigators have historically made use of water from Upper Klamath Lake between elevation 4143.3 and elevation 4136 [feet]. The best estimate of the capacity between these elevations is 486,830 acre-feet. This is the “active” storage capacity of Upper Klamath Lake. The total storage capacity of Upper Klamath Lake, including “inactive” storage is 629,870 acre-feet. Based on these capacities, annual volume within Upper Klamath Lake may not exceed 629,870 acre-feet, of which 486,830 acre-feet is active storage. (emphasis added) (KBA ACFFOD 07060; internal citations omitted).

OWRD, in both Determination Nos. 1 and 2, appears to interpret the instantaneous maximum storage capacity of the reservoir (based on now outdated bathymetry) as an annual operating limit, including any “carryover” storage. Specifically, the volume of stored water as of January 1, 2021 (based on 2017 bathymetry), is deducted from the figure 486,828 acre-feet, and then each subsequent day’s volume of stored water further reduces this figure, with the apparent assumption that when the figure is reduced to zero, no further water can be stored until January 1 of the following year.

Although the ACFFOD makes reference to 486,830 acre-feet as an “annual volume”, this in relation to the reservoir’s physical capacity in relation to the maximum water surface elevation of 4,143.3 feet. Reclamation acknowledges that the ACFFOD does not authorize Reclamation to actively store water in Upper Klamath Lake above the water surface elevation of 4,143.3 feet at any time of the year.

To illustrate the problems with OWRD's approach, consider the scenario, which has occurred in the period of record, that Upper Klamath Lake is at the water surface elevation of 4,143.3 feet (i.e., "full") on January 1 of any given year. Under OWRD's current accounting, Reclamation would not be allowed to store any water in Upper Klamath Lake until the following January.

In this regard, Reclamation would like to remind OWRD that as a water right of record, established in accordance with Oregon Revised Statutes chapter 539, this right "shall not be impaired or affected by any provision of the Water Rights Act (defined in ORS 537.010)..." (Or. Rev. Stat. §539.010(4)) (emphasis added). Consistent with the United States' original claims, no part of the ACFFOD suggests that Reclamation is limited in storing water in Upper Klamath Lake up to 4,143.3 feet any time of the year, subject to natural inflows and other senior water rights. Reclamation is not aware of any statute or other precedent in the State of Oregon that imposes the type of "one-fill" rule that OWRD seems to be placing on the United States' pre-1909 right to store water in Upper Klamath Lake.

Notwithstanding these substantive comments, Reclamation acknowledges the utility of having additional information on inflows and outflows from Upper Klamath Lake, particularly surface water inflow and evaporative losses that are currently unmeasured. Based on the site assessments and subsequent technical discussions that have occurred in response to OWRD's Final Order, Reclamation is proposing the following actions:

1. Install an acoustic doppler velocity meter (ADVM) type gage in Fourmile Canal, upstream of Thomason Creek.
2. Install an ADVM type gage in Crystal Creek.
3. Improve, including possibly relocating, the accuracy of the current gage on Sevenmile Creek (USGS gage no. 11504290).
4. Install evaporation platforms at two sites in Upper Klamath Lake.

Preliminary estimates for the equipment necessary to install the two new gages (Fourmile Canal and Crystal Creek) and improve the accuracy of the current gage on Sevenmile Creek is approximately \$80,000. The estimate for U.S. Geological Survey (USGS) to establish and maintain these gages in 2021 is approximately \$120,000. This estimate does not include the cost of operating and maintaining these gages beyond 2021. An agreement has not yet been reached between Reclamation and USGS over possibly adding these additional gage sites to the current service agreement between the agencies.

Time will be necessary to procure the necessary equipment and complete the required environmental compliance for this work. Environmental compliance may take three to six months, given that the proposed gages are to be located in culturally sensitive areas. Once installed, some period of time and varying flow conditions will be necessary to adequately calibrate each of the gages.

In regard to the two evaporation platforms, Reclamation has one eddy-covariance station that can be refurbished and deployed at one location. A second platform and the accompanying equipment will likely need to be procured. As the eddy-covariance method requires post-processing collected data, each platform should also include a bulk aerodynamic station, which will also need to be obtained. Preliminary cost estimates to buy and install the necessary equipment and platforms will be approximately \$65,000. The Klamath Basin Area Office is working with Reclamation's Technical Services Center to refine this estimate and ensure the initial plans include all the necessary equipment. Reclamation anticipates that these two evaporation platforms could be completed this upcoming summer.

Consistent with the Final Order, Reclamation will continue to coordinate with OWRD on the establishment of additional measuring devices. In the meantime, Reclamation requests that OWRD

further consider the substantive and technical matters raised here. If you have any questions regarding this letter, please contact me via email or phone at jbottcher@usbr.gov or (541) 591-2583.

Sincerely,

Jared Bottcher
Acting Klamath Basin Area Manager