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## State Water Resources Control Board

May 6, 2022

Kristin White  
Central Valley Project Operations Manager  
U.S. Bureau of Reclamation  
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### ORDER 90-5 SACRAMENTO RIVER DRAFT TEMPERATURE MANAGEMENT PLAN

Dear Ms. White:

This letter is in response to the U.S. Bureau of Reclamation's (Reclamation) Final Sacramento River Temperature Management Plan (TMP) submitted on May 2, 2022, pursuant to State Water Resources Control Board (State Water Board) Water Right Order 90-5. The State Water Board appreciates the unprecedented efforts of Reclamation and the other agencies and water users involved in Sacramento River temperature management to collaborate to develop a final TMP this year given the historic dry conditions, low Shasta Reservoir storage levels, and other challenges. The TMP is conditionally approved, as described below.

#### Background

Order 90-5 includes requirements on the water right permits and licenses for Keswick Dam, Shasta Dam, and the Spring Creek Power Plant requiring Reclamation to meet temperature requirements on the Sacramento River for the protection of Sacramento River fish species, including winter-run and fall-run Chinook salmon. Specifically, Order 90-5 requires Reclamation to operate to achieve an average daily temperature of 56 degrees Fahrenheit (F) on the Sacramento River at Red Bluff Diversion Dam (RBDD), located 60 miles downstream of Keswick Dam, to protect aquatic habitat conditions for spawning, rearing, and migration needs of salmon and other native fish populations during periods when higher temperatures would adversely affect the fishery. If there are factors beyond Reclamation's reasonable control that prevent Reclamation from meeting 56 degrees F at RBDD, Reclamation is required to identify an alternative compliance location and prepare an associated Temperature Management Plan (TMP) for consideration by the State Water Board.

E. JOAQUIN ESQUIVEL, CHAIR | EILEEN SOBECK, EXECUTIVE DIRECTOR

### Process to Develop the TMP

The Sacramento River watershed is currently experiencing extreme dry conditions, with the driest January through March on record following critically dry conditions in 2021 and dry conditions in 2020. Storage conditions in Shasta Reservoir this year have been significantly impacted by these dry conditions compounded by low carryover storage levels going into this year. The current storage level of Lake Shasta is 1.8 million acre-feet (MAF) (and not expected to increase), which is the lowest storage level seen for this time of year in several decades, the lowest storage level since installation of the temperature control device on Shasta Dam, and 1.7 MAF lower than average for this time of year.

In response to the significant water supply limitations in Lake Shasta this year, a collaborative process began this spring by state and federal agencies involved in Sacramento River temperature management to evaluate possible temperature management actions. The Sacramento River Settlement Contractors (SRSC), who hold substantial senior water rights and claims of right on the Sacramento River and contracts with Reclamation for supplemental supplies from the Sacramento River and Shasta Reservoir storage, were also part of this collaborative process given needed coordination with these water users in temperature management actions involving reservoir release volumes.

Several release schedules were evaluated as part of this effort, and maximum release targets of 4,500 cubic-feet per second (cfs) from May through August and 4,000 cfs in September were identified for this year's TMP. Key considerations in determining the targets were the ability to ensure temperature control at the Livingston Stone National Fish Hatchery with chillers, minimum flows needed for temperature management and habitat below Keswick Reservoir, limited ability to import water from the Trinity River system due to low storage levels on the Trinity and associated fisheries concerns, and minimal water supply diversions by the SRSCs (approximately 18% of contractual allocations).

Based on this release schedule, Reclamation developed a Draft TMP<sup>1</sup> that was submitted to the State Water Board on April 6, 2022. Following submittal of the Draft TMP, Reclamation worked with the Sacramento River Temperature Task Group (SRTTG) to refine the proposed operations in the draft TMP to develop the final TMP, incorporating comments submitted by the National Marine Fisheries Service (NMFS) on April 27, 2022, and supported by other SRTTG members. Those recommendations include a temperature management target of 54.5 degrees F on the Sacramento River upstream of Highway 44 (SAC gauge) for a 16-week window centered on August 2,

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<sup>1</sup> Available at: [https://www.waterboards.ca.gov/drought/sacramento\\_river/docs/draft2022-sacramento-river-temperature-management-plan-April6.pdf](https://www.waterboards.ca.gov/drought/sacramento_river/docs/draft2022-sacramento-river-temperature-management-plan-April6.pdf)

2022, and a shoulder temperature of 57.9 degrees F outside of the window. These recommendations are reflected in the final TMP. Based on these operations and the various modeling assumptions outlined in the TMP, NMFS modeling indicates an estimated winter-run Chinook salmon egg (stage independent) temperature dependent mortality (TDM) range of 52 to 58 percent and Reclamation modeling indicates a range of 42 to 51 percent. The lower end of the range assumes 2021 winter-run Chinook salmon redd distributions with the majority located within a short distance downstream of the dam (an optimistic assumption) and the higher end assumes an aggregate 2016-2021 redd distribution. However, actual redd distributions are uncertain and may be within the range or outside of this range.

The TMP also identifies a number of other uncertainties in addition to redd locations, including uncertainties due to the fact that this year's conditions and operations are well outside of the range of historical conditions and the calibration of the models. Specific areas of uncertainty identified by Reclamation include inflow hydrology, meteorology, reservoir stratification, redd distributions outside of the range evaluated, Sacramento River accretions and depletions, public health and safety water demands, infrastructure limitations, Trinity River imports and temperature management, low flow river and reservoir thermodynamics, and Delta water quality.

In addition to the Sacramento River temperature management recommendations, NMFS and the Yurok Tribe also submitted comments on Trinity River operations identified in the Draft TMP expressing concerns with elevated fall temperatures on Coho salmon and identifying proposed operations to reduce temperature impacts on the Trinity River. In the final TMP Reclamation agrees with the concerns regarding fall temperatures and commits to working with Trinity River stakeholders to coordinate temperature management actions on the Trinity, including the appropriate date for use of the auxiliary outlet for temperature management as well as potential adjustments to flows within the Trinity River system. Reclamation also agrees to work with the Trinity Management Council on refining the volume of fall imports to support fall temperature management on the Trinity River while conserving storage in Trinity Reservoir to the maximum extent possible.

#### Conditional Approval of the TMP

While the conditions this year are less than optimal for agricultural water supply and protection of fisheries, and there is acknowledged uncertainty, I have determined that with the following conditions of approval the final TMP provides reasonable protection of beneficial uses given the dry hydrologic conditions and low storage in Shasta Reservoir this year:

1. Reclamation shall take all actions within its reasonable control to improve temperature conditions for Sacramento River winter and fall-run Chinook salmon this year and going into next year, including actions to ensure that TDM levels

are minimized and carryover storage levels going into next year are maximized. Reclamation shall specifically evaluate whether adjustments to hydropower operations could be implemented to improve temperature management. I reserve continuing authority to modify my approval of the TMP based on any changed circumstances.

2. Reclamation shall operate in accordance with the final TMP, and report to the Executive Director in writing within two business days in the event that Reclamation's operations deviate from, or are expected to deviate from, those outlined in the TMP and this approval. The report shall explain why actual operations deviated from the TMP or are projected to, address whether the TMP objectives will be achieved, and include a plan to address any deficiencies within Reclamation's reasonable control.
3. As part of Reclamation's monthly updates to the State Water Board under the April 4, 2022 Temporary Urgency Change Order, Reclamation shall provide an update on Sacramento River temperature management operations, including reservoir storage and cold water conditions, releases, water diversions by the SRSCs, and other operations and conditions and whether those operations and conditions are consistent with the assumptions in the TMP and the reasons for any differences.
4. Reclamation shall consult at least weekly through October, and more often if warranted or requested, with representatives from the fisheries agencies and State Water Board to inform the agencies regarding real-time conditions related to temperature management and to receive input and advice from the agencies on this management.
5. Reclamation shall conduct monitoring, modeling, and other evaluations needed to ensure that temperature management actions are optimized and to inform future management actions as determined by the State Water Board in consultation with the fisheries agencies.
6. Reclamation shall, in coordination with the fishery agencies, evaluate the need for additional biological and water quality monitoring below Keswick Dam to evaluate the conditions this year on winter-run and fall-run Chinook salmon. Reclamation shall implement monitoring and reporting requested by the fisheries agencies or State Water Board Deputy Director for Water Rights. Monitoring and reporting may include, but is not limited to, evaluation of disease prevalence for in-river spawners and juveniles, harmful aquatic blooms, low dissolved oxygen

conditions, and other conditions that may impact the fecundity or survival of spawning adult and juvenile fish.

7. Reclamation shall, in coordination with the fisheries agencies, evaluate and implement feasible options at Livingston Stone National Fish Hatchery to ensure continuous needed cold water supplies for hatchery operations through this year's management season. Reclamation shall also, in coordination with the fisheries agencies, evaluate and implement feasible actions to ensure cold water supplies for the hatchery in future years.
8. Reclamation shall coordinate with the fisheries agencies and affected tribal governments to implement feasible management actions to avoid impacts to Trinity River fisheries, including feasible actions recommended by NMFS and the Yurok Tribe.

Thank you for your continued cooperation and coordination on this matter. If you have any questions regarding this letter, please contact Diane Riddle at [diane.riddle@waterboards.ca.gov](mailto:diane.riddle@waterboards.ca.gov).

Sincerely,



Eileen Sobeck  
Executive Director  
State Water Resources Control Board