BUREAU OF RECLAMATION

American River Group – Ad Hoc Meeting

Conference Line: +1 (321) 209-6143; Access Code: 985 598 947#
Webinar: Join Microsoft Teams Meeting

Thursday, September 7, 2023

Notes

1. Action Items
    a. NMFS – run egg mortality models to share at the next ARG meeting
    b. USBR – provide Folsom Lake temperature profiles, the isothermal bath, and table tracking cold water pool volume < 58 degrees F in the monthly meeting packet
    c. Vanessa – share modeling results with ARG
2. Introductions
    a. USBR: Thuy Washburn, Zarela Guerrero, Carolyn Bragg, Liz Kiteck, Amanda Snow, Melissa Vignau, Brad Hubbard, John Hannon
    b. NMFS: Barb Byrne
    c. USFWS: Craig Anderson, Paul Cadrett
    d. CDFW: Crystal Rigby, Duane Linander, Mike Healey, Emily Fisher, Jason Julienne, Nick Bauer, Jenny O'Brien, Erica Meyers
    e. SWRCB: Reza Ghasemizadeh
    f. Water Districts: Michelle Banonis, Greg Zlotnick, Paul Helliker, Tom Boardman
    g. City of Sacramento: Anne Sanger, Ryan Palmer, Brian Sanders
    h. City of Roseville: Sean Bigley
    i. City of Folsom: Marcus Yasutake
    j. DWR:
    k. WAPA: Mike Prowatzke

l. EBMUD: I-Pei Hsiu, Max Fefer

m. SMUD: Tyler Belarde

n. PCWA: Ben Barker, Darin Reintjes

o. FishBio: Kirsten Sellheim

p. Water Forum: Jessica Law, Erica Bishop, Ashlee Casey, Chris Hammersmark

q. PSMFC: Logan Day, Hunter Morris

r. Stantec: Craig Addley, Vanessa Martinez

s. CFS:

t. Shingle Springs Band of Miwok Indians:

u. Other: Jennifer Buckman

3. USBR Overview

a. USBR provided an overview of what transpired and noted that an investigation is currently underway that will inform what measures will be adopted to ensure a mistake of this nature doesn't ever happen again.

b. USBR provided information on how and why the temperature control device was not in the discussed positions and the effect this had on previous modeling.

c. In July the water temperature coming out of Folsom Dam was colder than anticipated, which was attributed to high inflows from snow melt that was believed to be making the water cooler. At that time, USBR identified that the data was suspicious and made an inquiry. The inquiry did not identify any issues.

d. The August profile again raised concerns, and USBR inquired with the crew at Folsom Dam to ensure everything was fine. The crew at Folsom Reservoir reported that there were no issues.

e. By August 15, USBR identified that the conditions they were seeing were not possible and launched a deeper investigation. Shortly thereafter, testing concluded that the shutters at the middle gates of the temperature control device were not fully closed.

f. USBR requested that the middle gates be lowered as soon as possible.

g. The issue was likely caused by the debris removal action taken in May. To remove the debris in the temperature control device they had to lift the

temperature control gates slightly and the mid gates were not lowered afterwards, as they should have been.

4. Current Conditions:

    a. The current temperature control device configuration:

        i. Units 1, 2, and 3 middle gates are completely down.

        ii. Units 2 and 3 upper gates have been pulled up.

            1. These needed to be pulled in order not to exceed 67° F at Watt Ave.

        iii. There is an outage on unit 1.

    b. Temperatures:

        i. Folsom Dam is 61.3° F

        ii. Watt Ave. is 64.7° F – due to ambient air temperature.

    c. Further action for the shutters will likely not need to occur for another 7-10 days. The forecasted low ambient air temperature is working in their favor.

    d. Questions/Comments

        i. Stantec noted that they found issues with boundary conditions in the initial July modeling which indicates that a more optimistic view of the situation was presented than was warranted.

        ii. CDFW requested that Folsom Lake temperature profiles, the isothermal bath, and table tracking cold water pool volume < 58 degrees F be included in meeting materials and asked if there was anything in these tables that would have suggested the cold water pool was being depleted?

            1. USBR responded that they were looking at data in real time and nothing stood out. They did reach out to the crew that takes the profile biweekly to check their equipment to make sure everything was correct.

            2. USBR commented that the temperature profile is in the meeting packet.

                1. CDFW commented that it is hard to estimate the volume based on the chart.

                2. USBR noted that the visual of Folsom can be used to determine the temperature layers and which gate the water should be coming from at what temperature.

iii. Stantec commented that it is possible to determine water volume (by looking at the temperature profile, where the water is coming from and how much is coming out of each powerhouse) as a diagnostic to indicate if something is wrong but USBR has never needed to do this.

iv. CDFW acknowledged that they didn't see any red flags in the information provided to them.

v. USBR commented that they don't have additional data beyond what is shared with the group.

5. Updated Temperature Modeling Results

    a. Stantec used the profile taken on 9/5/2023 and the updated USBR hydrology forecast to develop four sets of scenarios that incorporate the temperatures at Watt Avenue, data from previous years and running at 66° F:

        i. Scenario 1 – All shutters up by the beginning of October and no power bypass – worst case scenario

            1. October temps would be at 65 degrees F
            2. Results in less-than-optimal operation when flows drop in October
            3. Estimates warm temperatures for first week of November
            4. All shutters would be pulled around September 28th or 29th to coincide with flow decrease.

        ii. Scenario 2 – All shutters up by beginning of October and a 500 cfs max power bypass in the beginning of November

            1. Gets temperature to high 50's or low 60's to start
            2. It takes a while to get down to 58 degrees even with a bypass

        iii. Scenario 3 – All shutter pulled by Nov 1

            1. Operating to 66 degrees F or 67 ° at Watt Ave
            2. Buys some benefit in the fall.

        iv. Scenario 4 – All shutter pulled by Nov 1 and assumes 500 cfs max power bypass

            1. All shutters pulled by
            2. Provides a few degrees of benefit at the beginning of November.

    b. Discussion

i. NMFS asked if we increase the summer temp target back to 67°F does that give us potential cooler conditions in the fall?

ii. Stantec commented that the last few days average temp at Watt is 64°F in September. Is there a reason to be running to 64°F instead of 66°F?

    1. USBR responded that because the two upper shutters are pulled on units 2 and 3, the temperature coming out of the Dam is 61°F. By the time it gets to Watt Ave. it is 64° F. The water coming out of the dam could be warmed up to 65°F by moving the shutters back down, but that would make the temps at Watt Ave. exceed 66°F.

    2. Because there are only two units working at the moment, mixing from unit 1 is not possible.

    3. Stantec asked USBR if it was possible to drop a shutter and mix the water to raise the temperatures coming out of the dam?

    4. USBR responded that this scenario would likely result in exceeding the 66 degrees threshold at Watt Ave.

iii. NMFS commented that they are surprised that "cooler September/October with a bypass" was the warmest scenario and asked for clarity?

    1. Stantec responded that the fluctuation on the graph during the period with spikes is because the power bypass is turned on and off creating changes in temperatures. A bypass releases the coldest water in the reservoir so that when turnover occurs, the mixed temperature after the bypass is warmer than the mixed temperature would be if there had not been a bypass. That is why the "with bypass" scenarios are going to be warmer in the end of November and December than without bypass.

    2. Stantec clarified that full turnover does not occur until later than what is shown on the Summary graph, however, there is enough mixing of the water in November that the effects are essentially the same as the full turnover.

iv. CDFW asked if there was an unusual heat wave in November in the 2014 met data?

    1. Stantec replied yes, in early November.

v. Stantec commented that it is important to take the models with a grain of salt and not rely on the exact temperatures, but rather the comparison between the different scenarios. The actual temperatures will be dependent on real life air temperatures.

vi. CDFW asked if changes to the flow schedule would lead to different results?

1. Stantec responded that there might be minimal changes and offered to provide more models based on different flow schedules.

vii. CDFW suggested that any future modeling should take ramping rates for the power bypass into consideration as 500 cfs may not be immediately achievable.

1. USBR responded that they will have to look at their ramping from previous years.

viii. NMFS asked when unit 1 is anticipated to be working again to allow for the possibility of blending?

1. USBR responded that it will not be back until October 1.

ix. NMFS asked about the capacity per unit?

1. 25 to 3,000cfs per unit. They do not like to do 50/50 simultaneously. Usually run one unit at a time and switch back and forth.

x. NMFS asked whether it might be possible to drop the middle shutter on one of the units to do an interdaily blend through Lake Natoma.

xi. NMFS commented that going to 67 degrees or 68 degrees in September might be the best way to get the coolest water later, and asked if there is a point where you don't get any more gain in benefit?

1. Stantec commented that they'd have to run additional scenarios to understand the outcome. Without question it would help, but it would depend on the profiles.

xii. Stantec commented that they understand USBR prefers to run the units one at a time, but inquired if it might be possible to do a different timing ratio such as 30/70 rather than 50/50.

1. USBR responded that they would have to speak with their controllers to see if it could be worked into their schedule.

xiii. NMFS commented that they would like to know the constraints in blending that are causing temperatures to be at 66°F rather than 64°F.

xiv. USBR commented that the rain and cooler air temps have helped the water stay cooler. The current target at the dam is 62.5°F.

xv. USBR noted that if they lower shutters it may be two weeks before being able to raise them again due to constraints with crane operations. The operations are more limited this year because the dam is not deganged which means the shutters are either fully up or fully down and there isn't much flexibility.

xvi. NMFS expressed interest in dropping all of the shutters on one of the units and leaving the other unit with the top shutter in and blend temporally to try to achieve 67°F.

xvii. USBR agreed to target 67°F at Watt Ave by blending between units temporally starting as soon as Monday. If this blending action isn't able to achieve 67°F it will take at least 3 days to change the shutters again.

xviii. CDFW asked USBR how long it will take to get a first assessment of the conditions.

1. USBR responded that it will take roughly 3 hours at the Dam and a few days at Watt Avenue.

xix. NMFS asked if USBR plans to release more than 3,000 cfs in September? If not, would it be possible to keep water running through a single unit?

1. USBR will have to ask their controllers about this question.

xx. CDFW asked about the constraints related to wagasaki at Lake Natomas and if it is normal to prioritize this over fall-run Chinook salmon?

1. Wagasaki are sensitive and if there is anywhere from a 1 to 3 degrees differential in water temperatures they die off. The public is then concerned and reaches out.
2. There is no regulatory concern as they are a non-native bait fish that are highly prolific.

xxi. USBR asked what fish will be affected if the temperatures exceed 67°F?

1. NMFS commented that the BiOP is focused on ESA listed Central Valley Steelhead as well as fall-run Chinook which are an important prey species for the endangered southern Killer Whale. Water temperature above the low sixties is not optimal for steelhead rearing conditions. Rearing, holding, and incubation for steelhead occur in October and they would prefer to be close to 56°F.

xxii. NMFS is open to a short-term temperature exceedance if it means not using up all the cold water too early.

xxiii. NMFS intends to consider a power bypass request in the hopes of achieving cooler temperatures. They will plan on using the mid-September profile to run egg mortality modeling with the goal of submitting a bypass proposal by October 1.

xxiv. USBR noted that operating to 67°F is still within the temperature management plan so no formal changes need to be made.

The next regularly scheduled ARG meeting is on Thursday, September 21 from 1:30pm-3:30pm.