



**Requested Action:**

Receive an update on the status of the operations modeling completed in support of the Project's Biological Assessment and State Incidental Take Permit (ITP) application.

**Detailed Description/Background:**

Staff has advanced the modeling needed to support the Biological Assessment and Operations ITP application. Results from the modeling also help inform participants on anticipated Project benefits under updated operations. Several revisions to the model have been made since the modeling effort completed for the Revised Draft EIR/Supplemental Draft EIS:

- Updated diversion criteria based on the criteria approved by the Authority Board in March 2022
- Shifted to Alternative 3 based on changes approved by the Authority Board in March 2022
- Reduced deadpool size to 60TAF from 120TAF to reflect the assimilative nature of the preferred conveyance associated with the rightsized project. Further refinements of dead pool assumptions will continue as engineered reservoir release features and reservoir modeling are considered.
- Expanded exchanges with the Bureau of Reclamation (Reclamation) to improve anadromous fish benefits through more flexible operating criteria (requested by Reclamation) to achieve improved Shasta Lake coldwater pool management, fall river flow stability for salmon habitat protection, and spring pulse actions to support improved conditions for salmon migration.
- Updated baseline hydrology to include 2035 Central Tendency (climate change) and sea level rise. This was done at the request of Reclamation.
- To accommodate increased Reclamation investment, simplifying assumptions were made about Local PWAs storage accounts being adjusted.
- Other minor modifications, updates, and model improvements

Results from CalSim II, along with temperature, Upper Sacramento River daily operations, temperature-based egg mortality, and chinook salmon population modeling are being developed. This modeling will support the Biological Assessment and Operations ITP applications.

Two iterations of Alternative 3 were run to represent a range of federal investment. Because Alternative 3 includes federal investment of up to 25 percent, one run was completed with a federal storage allocation of 25 percent active storage (Alternative 3A), and a second run was completed with a federal storage allocation of 16 percent active storage (Alternative 3B). The storage allocation for each run was developed in accordance with the Approach for Allocating Reservoir Storage, approved by the Authority in April 2021.

***Modeling Takeaways for Participants***

While the full impact evaluation for the Biological Assessment and Operations ITP application are still under development, modeling completed to date can help participants evaluate how revisions to Project operations and shifting to Alternative 3 affects anticipated costs and benefits.

**Takeaway #1: More federal investment results in less cost for local participants and more efficient reservoir operations.**

Modeling results indicate that greater storage allocation results in more efficient reservoir operations, or greater reservoir releases on average over the long-term. A summary of long-term average releases under climate change hydrology is provided in Table 1, below.

**Table 1. Modeled Long-term Average Releases from Sites**

	<b>Alternative 1B Historic Hydrology (TAF)</b>	<b>Alternative 3A 2035 CT (TAF)</b>	<b>Alternative 3B 2035 CT (TAF)</b>
<b>Wet</b>	82	103	108
<b>Above Normal</b>	132	390	318
<b>Below Normal</b>	222	354	322
<b>Dry</b>	449	443	451
<b>Critical</b>	338	288	290
<b>Average</b>	<b>234</b>	<b>284</b>	<b>274</b>
Alternative 3A = Reclamation at 25% storage allocation; Alternative 3B = Reclamation at 16% storage allocation. CT = Central tendency; a modeling future baseline that considers future climate change conditions based on a 30-years of change assuming a “central tendency” of 2035 (so considers conditions from 2020 to 2050, with 2035 in the middle of this 30-year span).			

**Takeaway #2: Benefits for local participants do not substantially change with model updates and increased federal investment.**

Despite revised diversion criteria and less storage allocated to local participants under Alternatives 3A and 3B, releases do not substantially decrease as compared to Alternative 1B. In the case of Alternative 3B, releases to participants south of the Delta increase over the long-term over Alternative 1B, though this is likely due incorporating a climate change hydrology. Table 2 summarizes releases by participant type.

**Table 2. Modeled Long-term Average Releases from Sites by Participant Type**

	<b>Alternative 1B Historic Hydrology (TAF)</b>	<b>Alternative 3A 2035 CT (TAF)</b>	<b>Alternative 3B 2035 CT (TAF)</b>
<b>North of Delta</b>	29	26	27
<b>South of Delta</b>	111	109	127
<b>State</b>	65	61	63
<b>Reclamation</b>	28	88	58
<b>Average</b>	<b>234</b>	<b>284</b>	<b>274</b>
Alternative 3A = Reclamation at 25% storage allocation; Alternative 3B = Reclamation at 16% storage allocation. CT = Central tendency; a modeling future baseline that considers future climate change conditions based on a 30-years of change assuming a “central tendency” of 2035 (so considers conditions from 2020 to 2050, with 2035 in the middle of this 30-year span).			

**Takeaway #3: Changes in modeling and federal storage result in greater overall anadromous fish benefits.**

Based on the modeling efforts to date, expanding exchanges with Reclamation at Shasta Lake as well as supporting operations for spring pulse flow actions and fall flow stability result in greater benefits to anadromous fish than seen under the Revised Draft EIR/Supplemental Draft EIS. Demonstrating anadromous fish benefits/environmental benefits is part of the Authority’s Vision and Mission and is one of Reclamation’s NEPA Purpose and Needs for the Project. Quantifying these benefits allows Reclamation to demonstrate continued feasibility, improving the likelihood of additional future federal funding. Additional analyses are underway to confirm and build upon the revised modeling efforts conducted to date.

**Next Steps**

There are additional analyses that are being conducted to support the development of the Biological Assessment and Operations ITP application. From

these efforts, the Project is expected to complete the submittal of these two documents before the end of May 2022.

Results from the modeling will be used by Reclamation to finalize the federal feasibility and assess the possible federal benefits from Sites. This analysis is expected to be completed in approximately June of 2022.

Concurrently, the Authority will need to evaluate risks, benefits, and capacity availability associated with accommodating increased participation by Reclamation and/or new participants on the “waiting list”. With Local PWA subscriptions following the Amendment 3 rebalancing at near full capacity, voluntary reductions will be needed to accommodate Reclamation and new participants. Informally, there have been expressions of interest to reduce, but over the next two months, the Authority will need to firm these up so that “offer letters” can be distributed by the end of June 2022. Substantial completion of the participation mix for the project in the near term is needed to ensure the long lead financing tasks of securing revenues to pay cost shares can be completed in time for a mid 2024 start of Phase 3, followed immediately by groundbreaking before end of 2024.

**Prior Action:**

September 2021: Receive an update on the status of resolution of discussions with Reclamation on how Project operations will be addressed in the Biological Assessment.

July 2021: Received update on the status of permitting activities as compared against the Amendment 2 Work Plan.

**Fiscal Impact/Funding Source:**

Efforts on the Biological Assessment and Operations ITP application are covered in the Amendment 3 Work Plan and the current efforts are anticipated to remain within the budget in the Work Plan.

**Staff Contact:**

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**Primary Service Provider:**

Jacobs, ICF, and HDR

**Attachments:**

None