2020 EMERGENCY OPERATIONS PLAN FOR THE SPRING HEAD OF OLD RIVER BARRIER

This year, the Spring Head of Old River (HOR) barrier is planned to be installed and operational by April 1, 2020, with the removal scheduled to start on June 1, 2020.

The following procedure shall be used to monitor flows and stages on the San Joaquin River at Vernalis during the spring operation of the HOR barrier and in the event the HOR barrier requires an emergency removal.

Weir Opening and Emergency Removal

1. Beginning March 1, the contact person for the U.S. Bureau of Reclamation (Reclamation) in coordination with the contact person for the Department of Water Resources' (DWR) Operation and Maintenance (O&M) shall develop a daily plan of operations for the period starting on March 15 and extending through the end of May.

   This operation plan shall be based on the latest forecasted target flow at Vernalis and reservoir operations, consistent with that Vernalis target, that meet on a given day the scheduled daily flows at Cressey on the Merced River and below Goodwin Dam on the Stanislaus River. The daily plan of operations shall also include the estimated daily accretions to the flow at Vernalis for that same period.

2. The plan of operations specified, and any updates to it, shall be transmitted to the Project Manager for the Temporary barriers Project (TBP) and to the contact person for DWR's Division of Flood Management (DFM).

3. During this period, the Project Manager for the TBP and the contacts for Reclamation, DWR's O&M, and DFM will be engaged. In lieu of conferring on a daily basis to determine the forecasted flow and stage at Vernalis for the current day and following day, current and project reservoir releases and the NOAA National Weather Service California Nevada River Forecast Center's river forecast for Vernalis: (https://www.cnrfc.noaa.gov/graphicalRVF.php?id=VNSC1) will be reviewed. The team shall conduct daily meetings if the situation escalates and even more current operational and forecast information is needed to support quick decisions.

   The purpose of the conference call is to determine if Vernalis flow and stage may exceed the flow threshold established for safe operation of the HOR barrier. DFM shall monitor satellites, weather forecasts, and analyses on a daily basis, and shall notify the Project Manager for the TBP and the contact persons for Reclamation and O&M of any weather system which may affect the watersheds tributary to Vernalis.

In the event that significant precipitation or increased reservoir inflow is forecasted to occur, DFM shall also provide a daily (or more frequently as needed) runoff forecast and analysis addressing flow at Vernalis to the Project Manager for the TBP and the contact persons for Reclamation and O&M. Based on the latest flow forecast, the Project Manager for the TBP will estimate the stages at the HOR barrier. The stages are derived from the Vernalis rating curves, which will be updated periodically to ensure their accuracy, and corresponding stages measured near the HOR barrier site. This analysis shall include forecasts for the current day through several days in the future.

4. The weir at the HOR barrier shall be opened within 24 hours and the barrier shall be removed as soon as possible thereafter, if the daily flow at Vernalis is measured or forecasted to exceed a flow at Vernalis that would correspond to stage at the HOR barrier of 10.0 feet Mean Sea Level (MSL) or 12.3 feet National American Vertical Datum (NAVD 88), and if the likelihood is high of exceeding 11.0 feet MSL or 13.3 feet NAVD 88, which is the height of the HOR barrier.

5. The target flow during this period may vary at Vernalis from year to year. Given the need to maintain desirable flows on the tributaries to the San Joaquin River above Vernalis, the measured flow at Vernalis is expected to vary 500 cubic feet per second (cfs) plus or minus during normal operations. Notwithstanding the stage threshold as described in Paragraph 4, if actual or forecasted flows at Vernalis exceed 7,800 cfs, or the actual or forecasted freeboard at the HOR barrier is less than 1.5 feet, then the Project Manager for the TBP shall immediately convene a conference call with the contact persons for Reclamation and DWR's O&M, DFM, and Division of Engineering (DOE), as well as the South Delta Water Agency, U.S. Army Corps of Engineers (Corps) if necessary, and other agencies, as needed, to evaluate the situation leading to the actual or forecasted flow over 7,800 cfs or 1.5 foot minimum freeboard and to determine an appropriate course of action agreeable to all parties to reduce flows below 7,500 cfs as soon as possible. If the course of action includes a change in reservoir operations, the revised reservoir operations plan shall be submitted to the Corps for their concurrence. If the Corps does not authorize the reservoir operational changes, then the conditions in Paragraph 4 shall apply.

6. Upon determining that the conditions in Paragraph 4 apply, the Project Manager for the TBP shall notify the contact person in DOE to ensure that the barrier weir portion is opened within 24 hours, or as soon as possible. DOE shall take action to open the weir portion of the barrier, which includes the following:

    - DOE shall direct the barrier contractor to mobilize as soon as possible with an excavator, track loader and a 10-wheeler dump truck;

    - DOE shall assure all culvert slide gates are open; and

    - The contractor may take up to 12 hours to complete the removal of clay from the weir portion of the barrier.

7. Upon determining that the conditions in paragraph 4 apply, the four contact persons shall immediately confer to determine what actions may be taken to reduce Vernalis flows to 5,000 or below within 72 hours to facilitate the removal of the HOR barrier. Complete controlled barrier removal is not feasible above flows of 5,000 cfs.

8. If it is determined that reservoir release reductions are required to reduce Vernalis flows below 5,000 cfs to facilitate HOR barrier removal, the contact person in O&M shall immediately contact Reclamation to determine the schedule of release changes for each tributary required to achieve the necessary reduction in Vernalis flow, as soon as possible.

9. If it is feasible to reduce reservoir releases in order to reduce Vernalis flows below 5,000 cfs within 72 hours, the schedule of release changes devised shall be transmitted immediately to the Project Manager for the TBP and the contact person in DFM. DFM may then use the scheduled release changes to revise the forecasted Vernalis flows. Upon reducing flows, the barrier breach procedures shall include:

    - DOE and the Project Manager for the TBP notifying the appropriate agencies that an emergency breach operation shall be underway within the next three to six hours. These agencies include both adjacent Reclamation Districts and the DWR O&M Area Control Center;

    - DOE directs the contractor to mobilize operators, laborers, and equipment, including two excavators, one track loader, one bulldozer, two aluminum boats with motors, and two 10-wheeler dump trucks;

    - DOE assures all culvert slide gates are open;

    - DOE directs excavators to breach the barrier at two locations on either side of the weir section;

    - DOE directs boat to be staged approximately 150 feet upstream and downstream of the barrier;

    - DOE directs the contractor to breach the barrier approximate 10-feet wide by 5-feet deep on both locations and withdraw equipment as safely and as quickly as possible off the barrier until water level differential stabilizes; and

    - DOE perform extensive levee evaluation downstream of the breach.

10. If it is determined by the contact person in Reclamation that it has or shall become infeasible for its members to implement release changes on the tributaries to the San Joaquin that could reduce the flow of the San Joaquin at Vernalis to 5,000 cfs within 72 hours, then the contact person for Reclamation shall immediately notify the Project Manager for the TBP describing the specific limitations affecting their potential response.

Rate of Release Change Constraints

Each of the tributaries to the San Joaquin River has a large flood control reservoir: New Melones Reservoir on the Stanislaus River, New Don Pedro Reservoir on the Tuolumne River, and Lake McClure Reservoir on the Merced River. The Corps has published flood control criteria for each of those reservoirs. Release increases and decreases are constrained by these criteria for reasons of safety and channel stability. Responses to facilitate the emergency removal of the HOR barrier shall be limited by these criteria.

Flood Control Project Rate of Change Constraints

Tributary	Reservoir	Max. Rate of Decrease	Max. Rate of Increase
Stanislaus	New Melones	1,000 cfs/hour	1,000 cfs/hour
Tuolumne	New Don Pedro	1,000 cfs/2 hours	2,000 cfs/2 hours
Merced	Lake McClure	1,000 cfs/hour	1,000 cfs/hour

Approximate Travel Times for Flow Changes

Tributary	Release Point	Approximate Travel Time to Vernalis
Stanislaus	Goodwin Dam	1.5 days
Tuolumne	LaGrange Dam	2 days
Merced	McSwain Dam	3 days
San Joaquin	Friant Dam	7 days
Kings via Fresno Slough	Pine Flat	8 days

Primary/Alternate Points of Contact

Temporary barriers Project Manager

Primary: Jacob McQuirk – (916) 653-9883 or (916) 524-6645 (Mobile)

Alternate: Karen Tolentino– (916) 653-9795

Division of Flood Management

Primary: Elizabeth Bryson – (916) 574-1358 or (916) 531-0347 (Mobile)

Alternate: Jeremy Hill (916) 574-0353 or (916) 628-7656 (Mobile)

Flood Operation Center (FOC) – (916) 574-2619

Division of Engineering

Primary: Tru Van Nguyen – (916) 653-4143

Alternate: Hoang Le - (916) 651-7056

Division of Operations and Maintenance

Primary: Tracy Pettit – (916) 574-2662

Alternate: Bryant Giorgi – (916) 574-2660

Project Operation Center (POC) – (916) 574-1960

U.S. Bureau of Reclamation

Primary: Tom Patton – (916) 979-2196

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