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May 22, 2023

Via Electronic Submittal (E-File)

Kimberly D. Bose, Secretary
Federal Energy Regulatory Commission
Office of Energy Projects
888 First Street, N.E.
Washington, DC 20426

RE: Potter Valley Hydroelectric Project, FERC No. 77-CA
2023 Flow Variance Request Due to Limited Storage Capacity

Dear Secretary Bose:

Please consider this letter a request for a 2023 flow variance for Pacific Gas and Electric Company's (PG&E) Potter Valley Project (Project), Federal Energy Regulatory Commission (FERC) No. 77. Article 52 of the Project license requires PG&E to comply with the National Marine Fisheries Service (NMFS) Reasonable and Prudent Alternative (RPA) that was made part of the license by FERC's "Order Amending License, issued January 28, 2004." The RPA includes requirements for the minimum instream flows of the Project.

PG&E is engaged in studies to evaluate the seismic risk at Scott Dam as part of its dam safety program. Recently, PG&E dam safety engineers determined that the seismic risk is greater than previously understood. To reduce the potential seismic risk, PG&E has determined that the gates at Scott Dam will not be closed indefinitely to impound water above spillway elevation, reducing the water storage capacity by approximately 20,000 acre-feet (AF). With the dam's spillway gates remaining open, water availability is expected to be similar to dry conditions experienced in 2020 and 2021, when Lake Pillsbury's spring top-off did not reach the spillway crest elevation and the Project operated under FERC-approved flow variances.

Accordingly, PG&E is requesting a variance for 2023 from the current requirements to reduce East Branch Russian River (EBRR) flows to proactively manage reservoir storage in a manner that is protective of Project facilities and minimize potential impacts to fish species residing in the Eel River protected under the federal Endangered Species Act (ESA). PG&E is requesting expedited review of the variance. In addition, pursuant to FERC's letters dated March 28, 2023, and April 28, 2023, PG&E is beginning discussions

to develop the longer-term flow regime to assure compliance of environmental requirements with the spillway gates remaining open.

Lake Pillsbury Minimum Pool

As a condition of a prior flow variance for the Project issued on July 15, 2016, FERC required PG&E to "determine the current low level operation constraints at Lake Pillsbury (beyond operator recommendations) that support a low reservoir elevation level." To address this requirement, PG&E submitted to FERC on April 3, 2017, a Technical Memo (TM) that identified and evaluated potential dam safety and operational constraints on lowering the operating level. The TM found a high potential of bank sloughing exists at pool levels between 5,000 and 12,000 AF; the degree of bank sloughing is partially dependent on the drawdown rate of the reservoir. Since this analysis was performed, PG&E has used 12,000 AF as the Lake Pillsbury planning minimum for water management (see Figure 1).

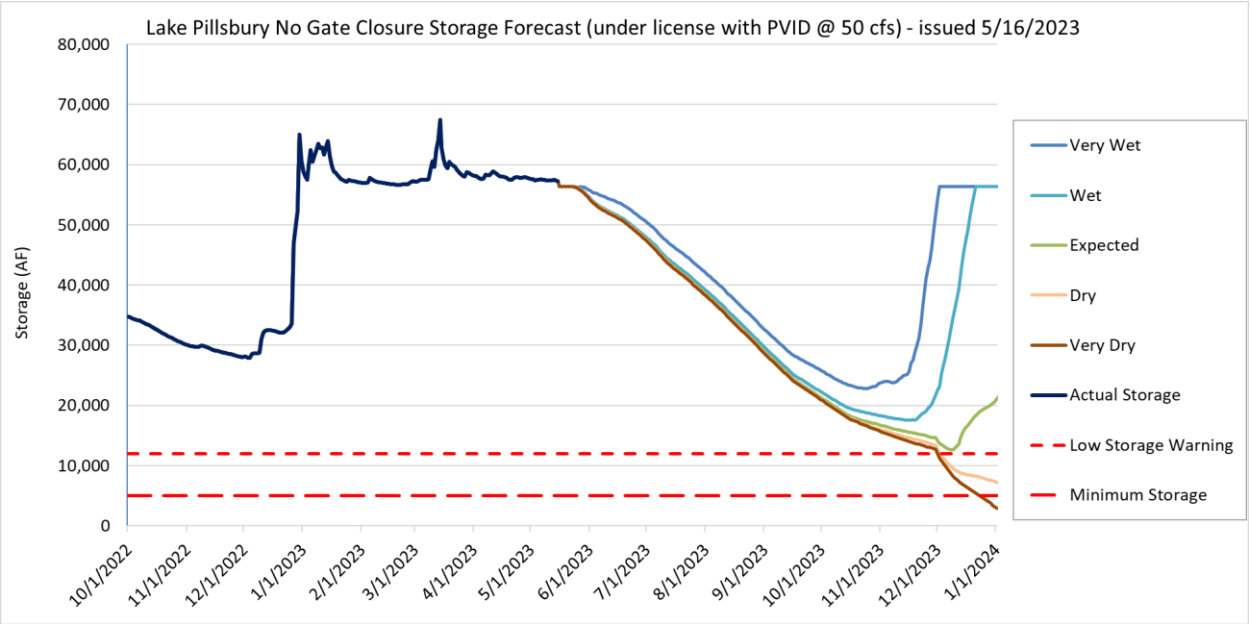


***Figure 1**. Lake Pillsbury daily storage forecast without flow variance under RPA flows and a range of inflow forecasts from the California-Nevada River Forecast Center (CNRFC). These storages forecast curves assume 2023 block water releases of 2,500 AF on 6/15 and Water Year 2024 block water release of 2,500 AF on 12/1.*

Current Minimum Instream Flows

Below is a summary of the license-required flows for Spring/Summer 2023 (Table 1).

Table 1: Expected Spring/Summer 2023 flows under RPA

Compliance Point	5/1 Requirement (cfs)	5/15 Requirement (cfs)	6/1 Requirement (cfs) with classification	8/1-9/30 Requirement (cfs) with classification
Eel River below Scott Dam (E-2)	100 cfs	100 cfs	Normal - 60 cfs	Normal - 60 cfs
Eel River below Cape Horn Dam (E-11)	Value depends on Eel Index Flow.	Value depends on Eel Index Flow.	Value depends on Eel Index Flow.	Wet –15 cfs
East Branch Russian River (E-16)	Normal - 35 cfs	Normal - 75 cfs	Normal - 75 cfs	Normal - 75 cfs, then 35 cfs after 9/15

The EBRR Project compliance point gaging station (E-16) is currently in the 'Normal' Water Year Type (WYT) classification and will remain there based on the current cumulative inflow to Lake Pillsbury to date. The required flows at E-16 are 75 cfs for the summer. This required flow is a significant drain on the limited storage in the reservoir and could make it impossible to maintain adequate storage in the reservoir under drier scenarios (see Figure 1).

The upper Eel River contains habitat for Chinook salmon (*Onchorhynchus tshawytscha*) and steelhead trout (*O. mykiss*), both of which are listed as threatened under the Endangered Species Act (ESA). Under this variance, modifications to the minimum flows on the Eel River below Cape Horn Dam are not proposed and modifications to minimum flows below Scott Dam are within thresholds previously evaluated under the RPA.

The RPA does not set a minimum for Potter Valley Irrigation District (PVID) contract water deliveries (only sets a maximum), outside of winter frost protection and post-harvest irrigation periods, tied to FERCs October 14, 2009, license article 52 amendment. Accordingly, reductions to PVID contract water deliveries are at PG&E's discretion and outside the scope of this flow variance request. Therefore, the variance reductions will address EBRR flows, the minimum and maximum of which are dictated by the RPA.

Proposed Variance

To preserve Lake Pillsbury storage and maintain cooler release water temperatures, the proposed variance will focus on meeting Eel River RPA flow requirements at E-11, and reducing flows to the EBRR at E-16 in response to Lake Pillsbury release temperatures as measured at E-2.

The following flow variance conditions will be in effect for 2023:

- Gaging Station E-2 will be reclassified as a Critical WYT. In practice, the E-2 flows will be the combined releases for E-11, E-16, and PVID, with a floor set by the minimum opening of the low-level outlet (approximately 35 cfs) (see Table 2).
- Gaging Station E-16 flows will be reclassified initially as Dry (25 cfs), as soon as FERC grants the variance request, and then will be adjusted between 5 cfs and 25 cfs based on PG&E and agency determination when daily average reservoir release water temperatures at E-2 exceeds 16 degrees Celsius. Additionally, E-16 will be adjusted between 5 cfs and 25 cfs if Lake Pillsbury storage forecast shows a reduction in flow releases is needed to maintain reservoir storage above concerning levels for facility safety through during this variance.
- The Drought Working Group (DWG) will meet once monthly during the variance period to discuss storage levels, release flow rates, water temperature profiles, release temperatures, and estimated temperature projections at E-2.
- PG&E will submit monthly storage reports to FERC.
- The drought variance will end when Lake Pillsbury storage exceeds 36,000 AF following October 1, 2023, or is superseded by another variance or long-term variance. This 36,000 AF storage threshold would allow the reservoir to meet minimum flow obligations, including a possible block water release, through January 2024 in the event of extremely low inflow in early winter.
- Flows will be calculated at a 48-hour average measured at E-11 rather than instantaneous. This will allow for a tighter compliance buffer on minimum E-11 flows.

Table 2: Proposed flows under 2023 variance for the summer baseflow period (Date of variance approval to September 30).

Compliance Point	Allowed Range: Min / Max	WY Classification	Notes
Eel River below Scott Dam (E-2)	20 cfs / No max.	Critical	Adjusted from Normal classification
Eel River below Cape Horn Dam (E-11)	15 cfs (Wet) / No max.	Wet	No change
East Branch Russian River (E-16)	5 cfs / 25 cfs	Critical / Dry	Adjusted from Normal classification
Potter Valley Irrigation District	No min. / 50 cfs	N/A	PG&E's discretion

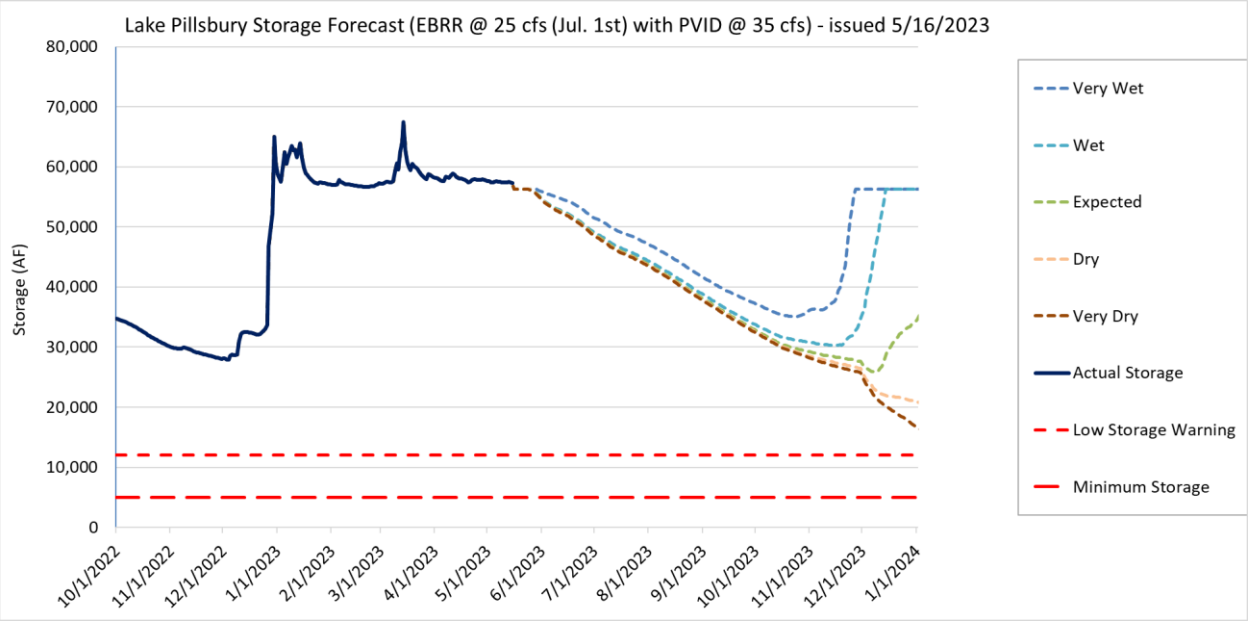


Figure 2. *Lake Pillsbury daily storage forecast with variance conditions in effect (assuming July 1st start date). Storage forecast curves assume 2023 block water releases of 2,500 AF on 6/15 and Water Year 2024 block water release of 2,500 AF on 12/1.*

Additional measures to monitor conditions in Lake Pillsbury and the Eel River below Scott Dam where ESA listed species may occur will include:

- PG&E will finalize the Lake Pillsbury CE-QUAL water temperature model in preparation of developing 5 potential reservoir management scenarios for future

reservoir operations, with agency input, that may be used to help inform 2023 variance flow management.

- PG&E will collect bi-weekly Lake Pillsbury vertical water temperature profiles immediately upstream of Scott Dam, starting after the reservoir ceases spilling through September 30, 2023. Reservoir water temperature data will be compared with historical temperature profiles and lake elevation data, used for the CE-QUAL water temperature model scenarios, and used to inform flow adjustments to EBRR. This information will be distributed to the DWG prior to monthly meetings.
- PG&E will collect bi-weekly spot temperature measurements at two accessible locations on the Eel River between Scott Dam and Cape Horn Dam (Eel River at/near Benmore Creek and Eel River at/near Trout Creek) to determine downstream water temperature changes, and associated water temperature suitability for salmonids. River temperature measurements will be collected beginning after May 15 in coordination with Lake Pillsbury vertical water temperature profiles.
- PG&E will provide funding consistent with the 2022 variance for CDFW and RVIT adult salmonid DIDSON monitoring effort on the mainstem Eel River above South Fork Eel and Middle Fork Eel River for the period of October 1 - January 31, 2024, as part of this variance.

Water Temperature Analysis and Conditions Under the Variance

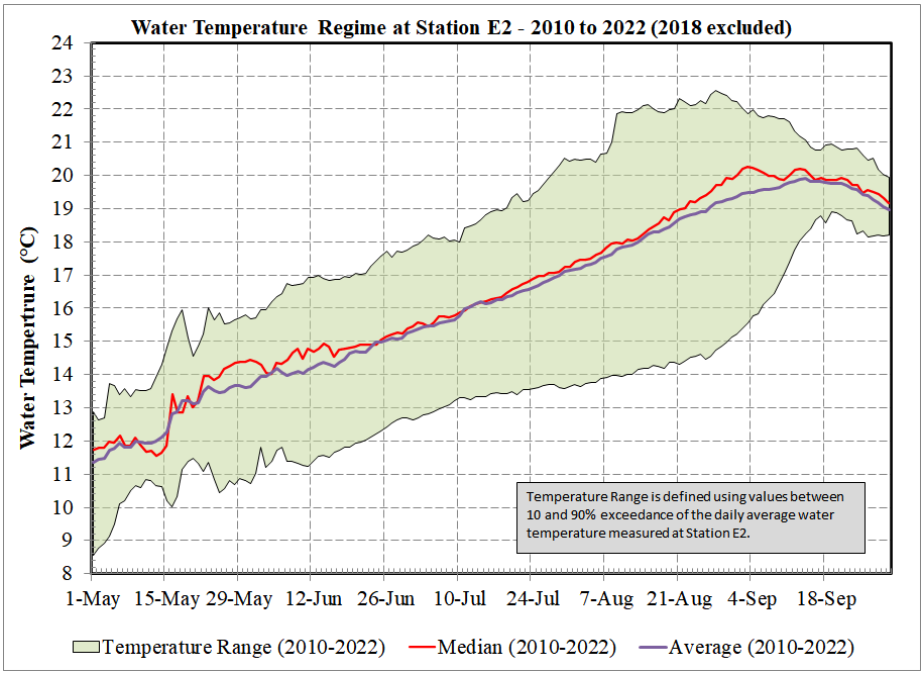


***Figure 3**. Summary of median, average, and 10%-90% exceedance range of water temperatures at E-2 between May and September, using 2010-2022 data (excluding 2018 due to Mendocino Complex Fire).*

In response to PG&Es *2022 Flow Variance Request Due to Limited Water Availability,* submitted May 13, 2022, FERC ordered PG&E to continue to conduct Lake Pillsbury water quality monitoring and develop water temperature modeling scenarios for the purpose of evaluating the potential benefits to cooler reservoir temperatures and water storage that support ESA-listed salmonids during the dry season (Enclosure 2). PG&E evaluated 12 years of historical water temperature data collected under the RPA to develop a regression model to satisfy the July 27, 2022, FERC Order. The water temperature analysis concluded that there are limited tools for mitigating high water temperature in the release from Lake Pillsbury. The small storage volume present in the deeper portions of the reservoir means that there is a limited supply of cooler water that is continuously being mixed with warmer surface water via discharges from the low-level outlet. This results in gradually warming discharges (as measured at gage E-2), especially during periods of high-volume releases.

The conclusion of the PG&E water temperature analysis was that managing releases was the only tool available to moderate water temperature releases from the reservoir. This method of storage control meters the volume of cooler water, reducing the mixing of warmer upper water layers down through the water column, and possibly allowing the natural cooling influences of later September ambient meteorological conditions to mitigate temperatures in the remaining reservoir volume. The results of this analysis are included in enclosure 2.

Based on the findings of the water temperature analysis, PG&E, in coordination with NMFS, California Department of Fish and Wildlife (CDFW), Round Valley Indian Tribes (RVIT) and United States Fish and Wildlife Service (USFWS) (hereafter Agencies) determined that a flexible management approach to reservoir releases in 2023 during the mid-July to late-September period could support cooler temperatures for ESA listed salmonids rearing in the Eel River downstream of Scott Dam.

Under the flexible management approach, PG&E will monitor release water temperatures as measured at E-2 during the summer. When daily average water temperatures exceed 16 degrees Celsius (which could occur beginning June assuming median and average values – see Figure 2), PG&E will notify Agencies and begin meeting on a weekly basis to determine if diversions to the EBRR, as measured at E-16, should be reduced in support of minimizing withdrawals from the reservoir in order to better manage release temperatures.

In coordination with Agencies, PG&E will adjust flows in EBRR between the range of 25 and 5 cfs for the period of mid-July through September 30, informed by observed release water temperatures as measured at E-2, as needed to preserve cooler temperatures releases from the reservoir in support of ESA listed species in the Eel River downstream of Scott Dam. After September 30, E-16 (EBRR) will be classified as Dry and remain at 25 cfs, barring the reservoir storage forecast indicating a lower release is necessary to avoid the reservoir reaching concerning levels later in the year.

Biological Impacts

PG&E biologists have reviewed this variance proposal and believe that the proposed flow variance is necessary to conserve water in Lake Pillsbury and provide adequate flow releases and suitable water quality conditions for the long-term protection of Chinook salmon and steelhead trout in the watershed. Below is their biological analysis.

Eel River below Lake Pillsbury and Van Arsdale Reservoir

The primary ESA-listed fish species impacted by the Potter Valley Project are Chinook salmon (*Onchorhynchus tshawytscha*) and steelhead trout (*O. mykiss*). Life stages of these species that could potentially be in the river and whose habitat conditions are influenced by project operations during the flow variance period are adult steelhead trout (pre- and post-spawn), and juvenile Chinook salmon and steelhead trout. If the variance extends beyond October, adult Chinook salmon will likely be present in the mainstem Eel River as well.

Adult steelhead trout migrate into the upper Eel River watershed to spawn primarily from January through April. Through May 14, 2023, of the current spawning season, 145 adult steelhead trout have been counted at Van Arsdale Fisheries Station at Cape Horn Dam. Under the proposed variance, flows in the Eel River for adult steelhead trout migration and spawning would not be reduced below the RPA-prescribed flows. Juvenile Chinook salmon remain in the river for several weeks after hatching and then migrate to the ocean during spring (typically April-June), as flows decline, and water temperatures increase. Juvenile steelhead trout, which typically spend one or more years in the river before migrating to the ocean during late winter and spring (typically February-June), require suitable habitat conditions throughout the summer. Under the variance proposal, available spring rearing habitat in the Eel River would not be affected by the variance. An increase in spring flows followed by a decrease to summer levels, as prescribed by the RPA, would still occur under the variance proposal, thus providing important migration cues for downstream migrating fish. The variance will also support cooler water temperatures in late summer for rearing juvenile steelhead trout. PG&E, in coordination with Agencies, will use the water temperature regression model, the updated CE-QUAL reservoir temperature model (note – model must be calibrated in coordination with Agencies prior to selecting/running scenarios), and other tools to inform reservoir release management from mid-July (assumed start of variance) through September 30 in support of maintaining release temperatures below 20 degrees Celsius at E-2.

Once approved by FERC, the proposed variance would reduce minimum flows in the reach between Scott Dam and Cape Horn Dam to preserve storage in Lake Pillsbury. While this will reduce the available summer rearing habitat for steelhead trout, minimum flows would remain above the E-2 “Critical” classification prescribed by the RPA. Summertime flow requirements in the Eel River below Cape Horn Dam under the proposed variance would remain unchanged from the RPA-prescribed “Wet” classification summer flow of 15 cfs, plus a buffer release.

Transitioning into fall and winter, the proposed flow variance is the prudent action, given reduced storage capacity in Lake Pillsbury and the unpredictability of storm activity and inflow conditions. Implementation of the proposed flow variance will conserve water in Lake Pillsbury and support suitable water quality conditions for aquatic resources below Scott Dam. It will also reduce the risk of reservoir bank erosion and sloughing at low reservoir storage levels that could limit PG&E's ability to make releases at Scott Dam, which could in turn impact downstream aquatic resources (including Chinook salmon and steelhead trout) due to changes in flow, high levels of turbidity, and sedimentation. Under the proposed flow variance, Agencies' WY2023 block water allotment under the RPA will be for use at their discretion, including during the fall/winter Chinook salmon spawning season to supplement flows if needed, given hydrologic conditions in the Eel River watershed.

East Branch Russian River (EBRR)

The primary fish species of interest in the EBRR downstream of the Potter Valley Powerhouse is non-federally ESA listed resident rainbow trout (*O. mykiss*). Both natural origin and hatchery rainbow trout inhabit this stream reach. CDFW historically planted catchable resident rainbow trout to support the local sport fishery; however, planting activities have been reduced in recent years due to persisting drought conditions and lower flows. Under the variance, flows in the EBRR would be reduced from Normal to between Dry and Critical classifications (75 cfs to 25-5 cfs), resulting in a reduction in habitat for rainbow trout and other aquatic species. In turn, this would likely result in the continuation of reduced sport fishing opportunities for the duration of the variance.

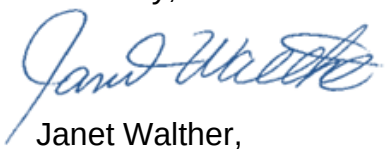
Agency Consultation and Conclusion

Given the risk that providing Project License-required flows with the reduced reservoir levels will lead to destabilizing drawdown rates and, in the worst case, reaching critical minimum pool at Lake Pillsbury, PG&E consulted with Agencies and the DWG during the development of the following variance proposal, and Agencies provided input to PG&E. PG&E requests that the variance proposal take effect as soon as FERC approves the request.

PG&E and Agencies met to discuss potential variance on May 2, 2023, and May 10, 2023. PG&E provided Agencies a draft variance proposal on May 11, 2023. Agencies provided comments on May 18, 2023, PG&E provided response to comments in enclosure 1 on May 18, 2023 (enclosure 1, consultation record). Additionally, the DWG was provided the draft variance prior to meeting on May 16, 2023.

If you have any questions, concerns, or comments, please do not hesitate to contact Jackie Pope, license coordinator at (530) 254-4007.

Sincerely,



Janet Walther,
Senior Manager, Hydro Licensing

Enclosures:
1.Agency Consultation Record
2. Lake Pillsbury water temperature modeling scenarios