15

City of Calistoga
Staff Report

TO: Honorable Mayor and City Council

FROM: Dan Takasugi, Public Works Director

DATE: January 15, 2013

SUBJECT: Discussion of State Division of Water Rights (DWR) Letter of December 18, 2012 on Kimball Reservoir Operations

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APPROVAL FOR FORWARDING:

Richard D. Spitler, City Manager

ISSUE:

Discussion of State Division of Water Rights (DWR) Letter of December 18, 2012 on Kimball Reservoir Operations.

RECOMMENDATION:

Discuss and provide direction to staff.

BACKGROUND/DISCUSSION:

The City of Calistoga received a letter on December 18, 2012 from the State Water Resources Control Board (SWRCB) Division of Water Rights (DWR) providing information on their analysis of the City's bypass at Kimball Reservoir. DWR believes that there may be violations of the City's Interim Bypass Plan, and has recommended actions. A response was requested to DWR within 30 days of that letter. The City provided a brief response, requesting that a response be provided within 60 days of their letter. DWR has since extended the response date to February 15, 2013.

In short, City staff believes that it has followed its own Interim Bypass Plan over the term of its existence since August 23, 2011, based on staff's methodology of flow measurement. The DWR analysis used a different methodology of flow measurement, and understandably came to other conclusions. Staff plans to continue positive

discussions with DWR and DFG to gain better alignment on flow measurement methodology.

The City takes water from Kimball Creek under two water licenses issued by the SWRCB: Amended License 9615 and Amended License 9616 ("Amended Licenses"). The City believes it has historically bypassed water in accordance with the written terms of those two licenses. The State Department of Fish and Game (DFG) and SWRCB indicated that, in their view, the City has an independent, ongoing responsibility to ensure that its use of water from Kimball Creek complies with the public trust doctrine, specifically, keeping fish in good condition below the reservoir.

Without either attempting to resolve the legal correctness of DFG's and the SWRCB's opinion, or conceding any past violation, the City approved an Interim Bypass Plan on August 23, 2011 to again address its public trust obligations, and determine the appropriate amount of water to bypass from Kimball Reservoir for the benefit of fish downstream. In order to develop the Interim Bypass Plan, the City hired biological and hydrological experts to assist with determining how to operate Kimball Reservoir in a way that would more effectively balance public trust values with the municipal demand for water: MBK Engineering opined as to hydrologic issues and Michael Podlech provided expert opinion on biological issues. Both are considered to be top experts in their respective fields. In approving the Interim Bypass Plan, the City balanced competing beneficial uses of its water. On the one hand, the City must provide reasonable protection for public trust values (i.e. fish downstream of the reservoir), while on the other hand the City must also make sure that it can meet municipal demands for water.

The Interim Bypass Plan imposed several commitments upon the City, in addition to seasonally-variable bypass requirements, as follows:

a. Construct bypass infrastructure capable of allowing bypass flow up to 3.2 cubic feet per second.
b. Perform an Instream Flow Study to provide a scientific basis of necessary bypass flows.
c. Retain an adaptive management approach to bypass operations.
d. Measure reservoir inflow using a mass-balance approach.

The added reservoir bypass infrastructure was completed in February 2012. It has been available for use to bypass flows up to 3.2 cubic feet per second.

The Instream Flow Study is currently being conducted by the DFG. The City had no funding for such a study, and the DFG had offered to perform this study with their in-house staff resources. The field work for this flow study has already commenced on City property and other properties. City staff are cooperating fully with DFG with this study. We anticipate this study to be completed in the next two years.

The City has an ongoing dialogue with DFG and DWR regarding bypass operations, and has been fully transparent in our records and availability for inspections on City property. Just recently, on January 9, 2013, the City allowed DWR to install a flow gauge immediately downstream of Kimball reservoir where they can monitor bypass.

The City utilizes a fairly complex spreadsheet model to calculate reservoir inflow, in accordance with Section 9.C of the Interim Bypass Plan. DFG was provided with a copy of the inflow spreadsheet model on November 3, 2011, and the City has updated DFG with bypass data since that time. No comments to that inflow spreadsheet model were received from DFG until a meeting with DFG on November 15, 2012. On December 12, 2012 City staff had agreed to several modifications of the bypass flow calculation, resulting from the November 15th meeting with DFG staff.

City staff would prefer a simpler method to physically gauge the inflow from the creek channel above Kimball reservoir. However, such a method is not desired by DFG. The City currently has telemetry to a level sensor gauge above Kimball reservoir with creek level data posted for public internet access. The level sensor gauge would only need a calibrated flow channel to measure reservoir inflow from this creek.

The inflow spreadsheet model uses a mass balance equation of seven (7) factors. The inflow model takes into account the change in reservoir elevation, the amount of water being bypassed, any water diversion to municipal supply, water passing over the dam's spillway, seepage through the dam's structure, rainfall, and evaporation. Due to the fact that minor changes in reservoir elevation correlate to major changes in reservoir volume, the inflow spreadsheet model has a high degree of data sensitivity. Per the Interim Bypass Plan's flow measurement commitment, a staff gauge is read on a daily basis to calculate the quantity of water held in the reservoir. Our inability to accurately and precisely get a visual read on the staff gauge elevation, combined with the inflow model's sensitivity, results in some misunderstandings of reservoir inflow, as stated on DWR's letter. Instrumentation and staff workload to improve the accuracy and precision of the inflow model are significant in cost.

The DWR letter of December 18, 2012 cites that the City had numerous violations to its own Bypass Plan. While the City has been complying with its own Bypass Plan, it should be noted that the DWR methodology for calculating bypass was notably different than that used by the City in the following ways:

a. Inflow and outflow calculations were not analyzed on a 7-day moving average, as the City has calculated.
b. Reservoir seepage was eliminated from the outflow calculation.
c. Evaporation was eliminated from the outflow calculation.

d. Negative inflow values (resulting from the inaccuracy of reservoir elevation measurements) were set to zero, instead of averaged into the 7-day moving inflow average.

City staff plans to address these issues in its response letter to DWR and will continue to work cooperatively with DWR and DFG to adaptively manage the inflow spreadsheet model.

The DWR letter also provided recommended goals regarding bypass calculation, as follows:

1. *"The City should calibrate and begin collecting data from the existing stream level sensor, located in Kimball Creek above the Reservoir, as well as install a stream level sensor in the West Fork of the Kimball Creek."* City staff has been willing to install such stream level sensors for use as primary measures of inflow. However, such a primary measure of inflow is not desired by DFG. The cost for such sensors, flow structures, power and telemetry, would likely cost between $50,000 and $100,000. The need for redundant inflow calculation beyond the existing mass-balance model is yet unclear.

2. *"The City should post and maintain a record of its calculated Kimball Creek bypass data on a monthly basis so that it is publicly available for review. The bypass data along with the sensor data may be used by entities outside of the City to independently evaluate the City's compliance."* Such posting of bypass data is possible, and staff would be glad to provide such information on the City's website. Because of the technology available and methodology used, the data cannot be posted in real time, and must be manually processed.

3. *"The City should no longer include losses due to evaporation in satisfying a portion of its bypass commitment."* Through previous discussions with DFG prior to this DWR letter, City staff had already committed to eliminating evaporation as a portion of its bypass commitment.

4. *"The City should re-evaluate the seepage numbers that it uses to calculate bypass outflow to reflect only the amount of water seeping below the Reservoir to Kimball Creek."* City staff is willing to re-evaluate the seepage as indicated by DWR.

5. *"The City should not use a 7-day moving bypass average to calculate bypass amounts."* Kimball Reservoir is a relatively small reservoir and is subject to highly

variable fluctuations of inflow. Using a 7-day moving average provides a more consistent bypass and relieves City staff from making continuous adjustments in bypass volume. Staff would desire to analyze the impacts of not using a 7-day moving bypass average in more detail before committing otherwise.

6. *"The City should install a transducer capable of measuring stage height to the nearest 0.05-foot."*
Such a transducer is possible, but cannot be installed until the reservoir's intake tower is replaced, estimated in 2014. In the meantime, staff has already started reservoir elevation measurements to the nearest 0.05-foot. A rough estimate of the additional cost for such a transducer, power, and telemetry installed on a new intake tower would be approximately $50,000.

7. *"The City should petition for an extension of time or request revocation of Permit 20395 within 30-days of receipt of this letter."*
The City does not, and has not, used Permit 20395 issued in November 1989. This permit cannot be used unless the City constructs an enlargement of the reservoir by 718 acre-feet. Staff recommends that Council begin actions to formally rescind Permit 20395, as it is not needed for General Plan growth and is financially and environmentally infeasible.

In summary, while the City has been in compliance with its own Bypass Plan, staff will to continue the open sharing of information and ongoing dialogue with DWR and DFG, as has existed over the past year. Based on Council discussions and direction, staff will prepare a response letter to DWR by the February 15, 2013 response date.

Due to the volume of specialized work and analysis, City staff intends to retain the hydrology services of MBK Engineering and the fisheries ecologist services of Mike Podlech to assist City staff in responses to State agencies and to help make the best recommendations that serve the interests of all Calistoga citizens.

ATTACHMENTS:

1. Letter from SWRCB of December 18, 2012
2. City Letter to SWRCB of December 27, 2012