



California Regional Water Quality Control Board
Lahontan Region



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Arnold Schwarzenegger
Governor

MEMORANDUM

Sent overnight mail

TO: Agenda Recipients

FROM:  Laurie Applegate, Executive Assistant
LAHONTAN REGIONAL WATER QUALITY CONTROL BOARD

DATE: July 1, 2009

SUBJECT: ADDITIONAL MATERIAL FOR JULY BOARD MEETING

Attached is additional material for Item 6 of the July agenda. The material contains comments received from State Water Board staff and the Lahontan Water Board staff responses.

Attachments

JULY AGENDA ITEM 6

STATE WATER BOARD STAFF COMMENTS AND RESPONSES

State Water Board staff performed an informal review of the Lahontan Regional Board 6 April 2009 Integrated Report Draft Staff Report and sent written comments to Regional Water Board staff dated May 20, 2009. Written responses have been provided to State Water Board staff. Most of the comments dealt with recommended changes to specific information in the water quality assessment database or the staff report. Changes have been made to the database, affecting information in the fact sheets. The revised staff report included in the agenda packet also includes changes in response to some of the State Board staff comments. The following is an excerpt from the response document covering State Water Board staff's major general issues. The acronym "LOE" stands for "Line of Evidence." **Region 6 staff's responses are shown in bold italic font following each comment.**

- TEMPORAL REPRESENTATION
 - Data for arsenic, boron, copper, fluoride, iron, phosphate, phosphorus, manganese, mercury, nitrate, sulfates, total dissolved solids, total nitrogen as N, and turbidity were assessed stating that temporal representation were not met. The following comments are applicable to these data.
 - Regional Board staff in the Draft Report stated that samples collected quarterly or fewer do not capture the diel, seasonal and annual variability expected in stream flows of the Lahontan Region however, the Listing Policy has definite requirements as to the quantity of data required for listing. Sampling frequency and temporal representation are two separate issues. As little as two samples are needed to list toxicants in a water body, and five samples for conventional and other pollutants. The temporal representation requirement refers to the applicability of the timing of the sample. Staff should exclude data when the timing of the samples was not representative of the critical timing that the pollutant is expected to impact the water body, or that the majority of the samples were collected on a single day or during a single short-term natural event.
RESPONSE: Staff report references to sampling frequency have been changed to emphasize temporal representation.
 - Temporal representation was cited as the reason for not using data that were collected quarterly or less frequently for evaluating objectives expressed as annual means. Since the purpose of averaging is to remove variation that may be reflected in individual data points, objectives expressed as an annual mean do not consider pollutant concentration variability within a year to be significant in determining whether standards are being met. Section 6.1.5.7 requires that samples collected during an averaging period be combined and considered as one sampling event. Even if sufficient data are not available for the stated averaging period, the available data shall be used to represent the averaging period.

RESPONSE: *Ranges of annual average concentrations and numbers of violations of annual average standards are cited in the LOEs. Lahontan Water Board staff disagree that annual averages based on 1-4 samples per year collected at quarterly or less frequent intervals are temporally representative of environmental conditions and critical aquatic life cycle stages in Region 6 waters. For example, studies in the Lake Tahoe area have shown that nutrient loads are explained largely by snowmelt runoff but can be significantly influenced by severe summer thunderstorm events. See <http://www.hydroikos.com/CoatsGoldman0201.pdf>.*

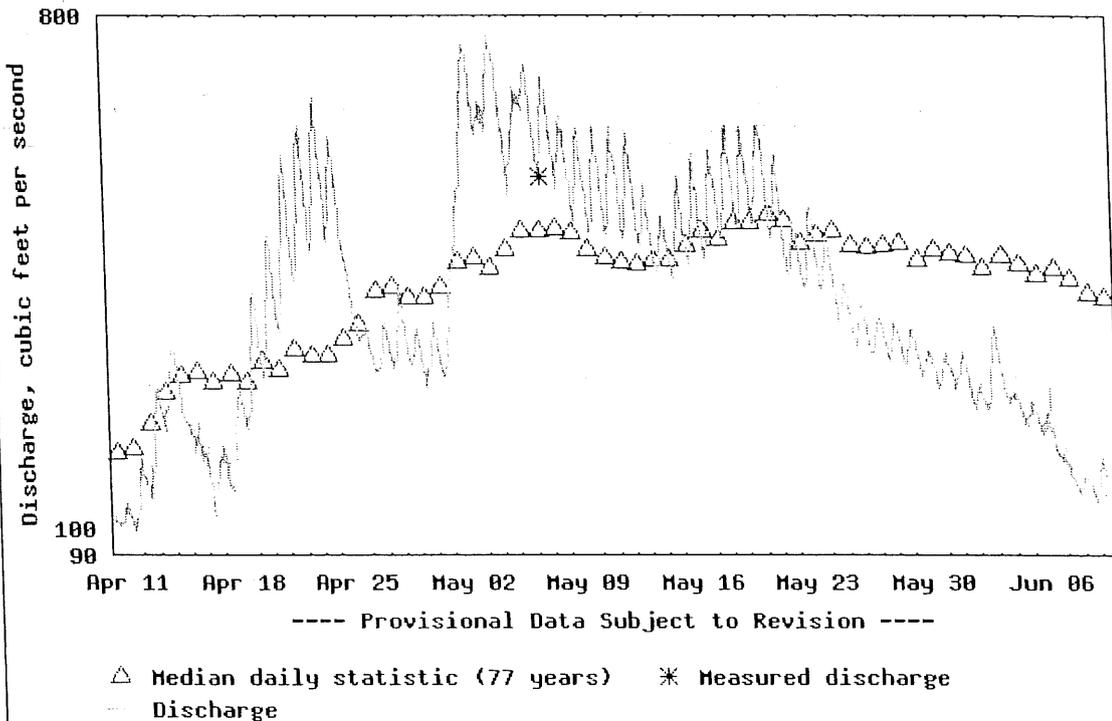
The following graph of "realtime" data from the West Fork Carson River at Woodfords for a 60 day period during the 2009 snowmelt season shows diel variations in discharge (based on gage height) and significant differences in 2009 discharge in comparison to long term "average" conditions. A quarterly sample collected in late April would have represented quite different flow-weighted constituent concentrations than a sample collected in early May. Research on central Sierra streams in the 1970s showed that nutrient concentrations vary on a diel basis depending on the presence or absence of dilution from snowmelt. The timing of peak snowmelt varies from year to year depending on factors such as air temperature, snowpack depth, precipitation (e.g. rain-on-snow storms).

Long term and short term variations in flows also affect water quality and biological processes in desert streams, and this variability is even less predictable than that associated with snowmelt. While the streams of Region 6 have not been studied as well as those discussed in the case study in Appendix A to the 2000 USEPA Nutrient Criteria Technical Guidance Manual: Rivers and Streams, similar variation in ecological processes is likely to occur. Due to the documented environmental variability, the case study states: "The characterization of ambient conditions with a few grab samples is inappropriate, if not reckless." Region 6 staff agree. See:

<http://www.epa.gov/waterscience/criteria/nutrient/guidance/rivers/rivers-streams-full.pdf>.



USGS 10310000 W FK CARSON RV AT WOODFORDS, CA



- Please verify that the water body-pollutant combinations listed in Appendix C do not meet the Listing Policy's requirement for temporal representation. If the temporal representation requirements are met, then staff must list these water body pollutants if they do not meet standards. **RESPONSE: As stated in the staff report and decisions for these water bodies, Region 6 staff's opinion is that the data for the water body pollutant combinations in Appendix C are not temporally representative.**
- TEMPERATURE
 - The temperature data was not assessed against any numeric temperature guideline. There are numerous temperature evaluation guidelines available to use. Regions 1, 2, 3, and 5 use a variety of different temperature guidelines for trout and salmon habitat. For example, Region 3 is using a 21 degrees C single sample exceedance guideline for rainbow trout habitat (Moyle, 1976). This guideline is an example of one of the guidelines that could be applied. All temperature data must be used in water quality assessment using one of the existing evaluation guidelines.

RESPONSE: The Region 6 temperature objective is a nondegradation objective that states that there shall be NO change in temperature for waters designated for the COLD use, and no change greater than 5

degrees Fahrenheit for waters designated for the WARM use. Except for a few typographical errors in the beneficial use table, all surface waters in Region 6 are designated for one or both of these uses. Since the objective includes quantitative thresholds, additional guidelines should not be necessary for assessment. Compliance with the objective was evaluated using the Listing Policy Section 3.10 provision for baseline/trend analysis, with the conclusion that quarterly temperature samples are inadequate to document baseline/trend conditions.

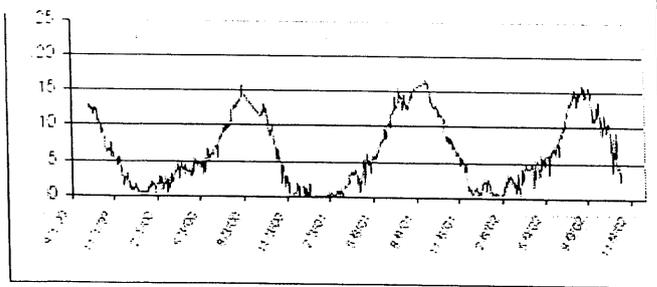
This conclusion is supported by the following graphs of mean daily temperature over time for several stream reaches in the Walker River watershed. The graphs were copied using a snapshot tool from a SWAMP- sponsored study of grazing impacts, available at: http://www.waterboards.ca.gov/lahontan/water_issues/programs/swamp/docs/herbst_kane_wwgs_2004.pdf. This study was not included in the 2008 assessment because it has not yet undergone SWAMP QA/QC checks. However, the temperature graphs indicate that (at least for eastern Sierra streams) quarterly samples collected in November, February, May and August (the approximate sampling times for many of the USGS/SWAMP datasets) would be biased toward lower temperatures.

The Lahontan Basin Plan defines the COLD and WARM beneficial uses in terms of aquatic ecosystems, in a sense broader than the support of coldwater or warmwater fish. Single sample maxima related to the ecology of coastal fish species are not necessarily appropriate criteria for assessment of aquatic ecosystems in the Lahontan Region. Trout were historically absent from much of the Lahontan Region due to glaciation or desert conditions. The native trout with the largest historical range, the Lahontan cutthroat trout, can tolerate temperatures as high as 25 degrees F. Most eastern Sierra streams have steep elevation gradients, and corresponding temperature gradients. Although an entire stream may be designated for the COLD use, its lower reach flowing through a "high desert" ecosystem may not necessarily be suitable for trout. Many Region 6 waters are designated for both the WARM and COLD uses. Ideally, assessment of temperature should involve continuous measurements year-round, or at least during critical periods for local aquatic ecosystems.

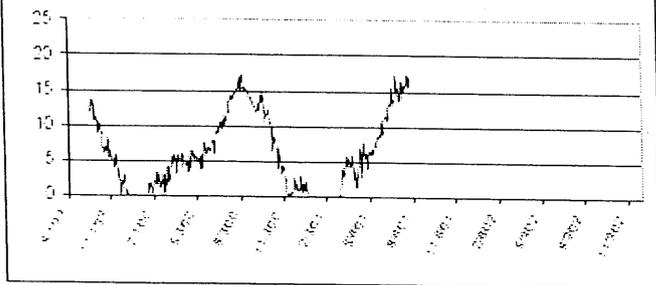
Figure 29. Mean daily water temperature (°C) - 1999 to 2002

Large Managed Grazing Sites

a: W Walker R - middle Pickel

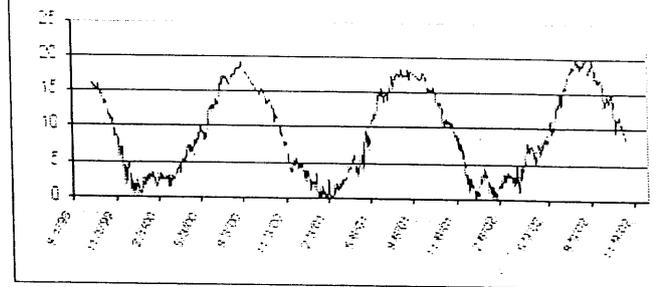


b: W Walker R - Settlemeyer

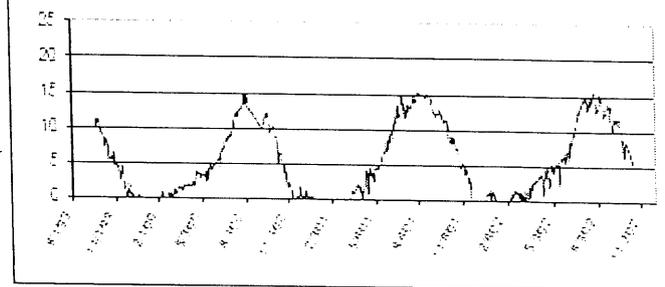


Large Minimal Grazing Sites

f: Robinson Cr - below campground



g: W Walker R - upper Leavitt



Medium Minimal Grazing Sites

h: Swauger Cr - lower Valdez

