

Appendix B-9

**Sonoma County Water Agency
Temperature and Water Quality Monitoring Summary Report
For the Russian River during April – October 2009**

Background

A Temperature and Water Quality Monitoring Plan was submitted in accordance with State Water Resources Control Board (State Board) Division of Water Rights Order WR 2009-0027-DWR (Order), approving a Temporary Urgency Change in Permits 12947A, 12949, 12950, and 16596 for Sonoma County Water Agency (Agency). Provision 8 of the Order required the Agency to prepare a Temperature Monitoring Plan and Provision 9 required the Agency to prepare a Water Quality Monitoring Plan for the Russian River and Lake Mendocino. On April 20, 2009, the Agency submitted a plan to meet the requirements of Order WR 2009-0027-DWR. Following public comment during a public workshop on May 6, 2009 and comments relative to the original plan, the State Board asked the Agency to revise the plan following consultation with the North Coast Regional Water Quality Control Board (NCRWQCB), NOAA National Marine Fisheries Service (NMFS) and the California Department of Fish and Game (DFG).

On May 14, 2009, the Agency consulted with staff from the County of Sonoma – Health Services Environmental Health Division (DEH), NCRWQCB, NMFS, DFG with staff from the State Board and DFG also present via teleconference. The review of comments received and consultation with all parties noted above resulted in a revised sampling and monitoring plan. The monitoring plan, deviations and results are summarized in this report.

Summary

The monitoring plan incorporated the use of both permanent and seasonal instrumentation to collect real time water quality information. The monitoring plan also included the evaluation of water quality through sampling and analysis for public health guidance and overall water quality conditions.

Real time water quality data (pH, temperature, dissolved oxygen content, specific conductivity, turbidity, and depth) was monitored at 16 locations along the Russian River using YSI Sondes. In addition, over 300 bacteriological samples (total coliform, *E. coli* and Enterococcus) and 130 nutrient samples (Ammonia-N; Nitrate-N; Total Organic Nitrogen; Total Phosphorous; and chlorophyll-a) were collected between May 28 and October 2 at the same locations. Monitoring results were posted to the Agency website as soon as the results were received. A summary of the monitoring results has been compiled into a electronic data matrix for submittal to the SWRCB, NCRWQCB and DEH. The matrix will also be available electronically via the Agency's website.

The 2009 sampling locations are shown in Attachment A and a detailed summary of the sampling program is provided as Attachment B.

Permanent and Seasonal Realtime Water Quality Monitoring

In coordination with the United States Geological Survey (USGS) the Agency maintains five multi-parameter YSI water quality Sondes on the Russian River located at Hopland, Diggers Bend in Healdsburg, the Agencies river diversion facility (RDS) at Mirabel, Hacienda Bridge and Johnson's Beach. These five Sondes are referred to as "permanent" as the Agency maintains them as part of its early warning detection system. The Sondes measure and record real time readings of water pH, temperature, dissolved oxygen content (DO), specific conductivity, turbidity, and depth, every 15 minutes and transmit the raw data via telemetry to the Agencies operations center. In addition, the Hopland, Diggers Bend and Hacienda Beach data is provided by the USGS on its "Real-time Data for California" website. During the time period of the Order the Agency offered an "email subscription" to the public if they wished to receive the data via email.

In addition to the permanent Sondes, the Agency seasonally deploys Sondes at various locations within the watershed. This year the Agency in cooperation with the USGS installed seasonal Sondes with real-time telemetry at the USGS river gage station north of Cloverdale at Commisky Station Road and at a new gage station at the Alexander Valley Road Bridge (aka near Jimtown). The Sonde at the new Riverfront Park gage could not be located in an acceptable location to transmit real-time data, consequently, Agency staff retrieved the electronic data approximately weekly. The Alexander Valley Road Bridge Sonde had problems with the turbidity sensor and the USGS determined that the turbidity data was not acceptable to be released. The Agency would like to recognize the USGS for its outstanding efforts in installing and maintaining the Sondes at Cloverdale and Alexander Valley Road Bridge. These Sondes were not part of their projected workload and the Agency realizes that they were heavily burdened with ongoing activities in many other coastal watersheds.

In coordination with the NCRWQCB the Agency deployed seasonal Sondes in the upper reach of the Russian River below Coyote Dam. The Sondes were deployed in the east fork of the Russian River below the Lake Mendocino outfall and just below the confluence of the east and west forks of the Russian River. The Sondes required kayaking the river to deploy and collect data, thus the data was collected approximately every three weeks.

As part of its estuary monitoring program the Agency installs seasonal Sondes in the lower portion of the Russian River below Duncans Mills. Sondes were deployed at Freezeout Creek, Heron Rookery, Sheepphouse Creek, Bridgehaven, Patty's Rock and at the mouth of the Russian River at Jenner. These sondes collected water pH, temperature, DO, specific conductivity, salinity, and depth, every hour. Monitoring at these locations is performed at more than one depth. Usually a surface location of approximately 1 meter in depth and a second at approximately 3 – 6 meters in depth.

Water Quality Sampling

The NCRWQCB in cooperation with the DEH conducts seasonal bacteriological and general water quality sampling at Russian River beaches which experience the greatest body contact recreation. To support the NCRWQCB, the Agency supplemented the seasonal program with an extensive bacteriological and nutrient sampling program.

The NCRWQCB seasonal sampling locations consist of: Camp Rose; Memorial Beach; Steelhead Beach; Forestville Access Beach; Johnson's Beach; and Monte Rio Beach. In addition to the seasonal sampling locations noted above, the Agency conducted supplemental weekly bacteriological sampling at: the Russian River near Commisky Station Road (Mendocino County); Cloverdale River Park; Geyserville Hwy 128 bridge; Alexander Valley Road bridge; and at Hacienda Bridge. These locations were selected as additional public recreational sites in consultation with NCRWQCB, NMF's DEH and DFG. During the course of the sampling program the Hacienda Bridge site was relocated to the newly opened Sunset Beach River Park, which is just downstream. Over 300 bacteriological samples were collected and analyzed between May 28 and October 2, 2009. The samples were analyzed by the Sonoma County Public Health Laboratory using the Colilert-18 quantitray MPN method for total coliform and *E. coli* and the Enterolert quantitray method for Enterococcus. Daily sampling was conducted following an acute exceedance of the California Department of Health Services – Draft Guidance for Fresh Water Beaches and continued until a “less than” result was confirmed or weekend laboratory staffing could not be coordinated within the required holding time. Agency staff collecting water quality samples also performed photo documentation and recorded observations during each weekly sampling event.

Both the seasonal and supplemental bacteriological monitoring programs experienced numerically low acute exceedances of the Enterococcus draft guidance limits both before and during “low-flows”. These exceedances while often just over the draft guidance limits required DEH to post beaches with unsafe for swimming or recreational use warnings. Staff at DEH, the NCRWQCB and the Agency responded to numerous calls from the general public during these episodes. Conclusions or correlations relative to the Enterococcus exceedances is difficult to undertake given the extreme variability of the river system, weather patterns and recreational use. In contrast there were very few total coliform and *E. coli* exceedances experienced during the same period. Agency, DEH and NCRWQCB staff will be discussing future bacteriological sampling programs and the necessity to analyze for all three bacteriological indicators.

In addition to the bacteriological sampling and in consultation with the NCRWQCB, NMFS and DFG, the Agency collected water samples for nutrient analysis at the following locations: Lake Mendocino outfall; Russian River near Commisky Station Road (aka Russian R NR Cloverdale); Alexander Valley Road bridge; Healdsburg Veterans Memorial Beach; Hacienda bridge; and Monte Rio Beach. Water samples were collected weekly and analyzed for: Ammonia-N; Nitrate-N; Total Organic Nitrogen; and Total Phosphorous. In addition, chlorophyll-a was analyzed for all stations except the Lake Mendocino outfall. Results from the nutrient analysis indicated that there was no elevated concentration of nutrients during the monitoring period and in almost all instances results were below method detection limits.

The Agency also conducted a separate but related estuary bacteriological and nutrient sampling program. Agency staff collected bacteriological and nutrient samples once every three weeks at three locations in the estuary: (1) Freezeout Creek below Duncans Mills; (2) Bridgehaven; and (3) River mouth at Jenner. Similar to the previously described bacteriological and nutrient constituents the estuary samples were analyzed for total coliform and *E. coli* using the Colilert-18 quantitray MPN method and Enterococcus using the Enterolert quantitray method. Nutrients analyzed were consistent as described previously. Bacteriological monitoring in the estuary was not meant to supplement the NCRWQCB and DEH seasonal sampling program nor to consider results relative to the draft DPH guidance but rather to provide data more informational in nature.

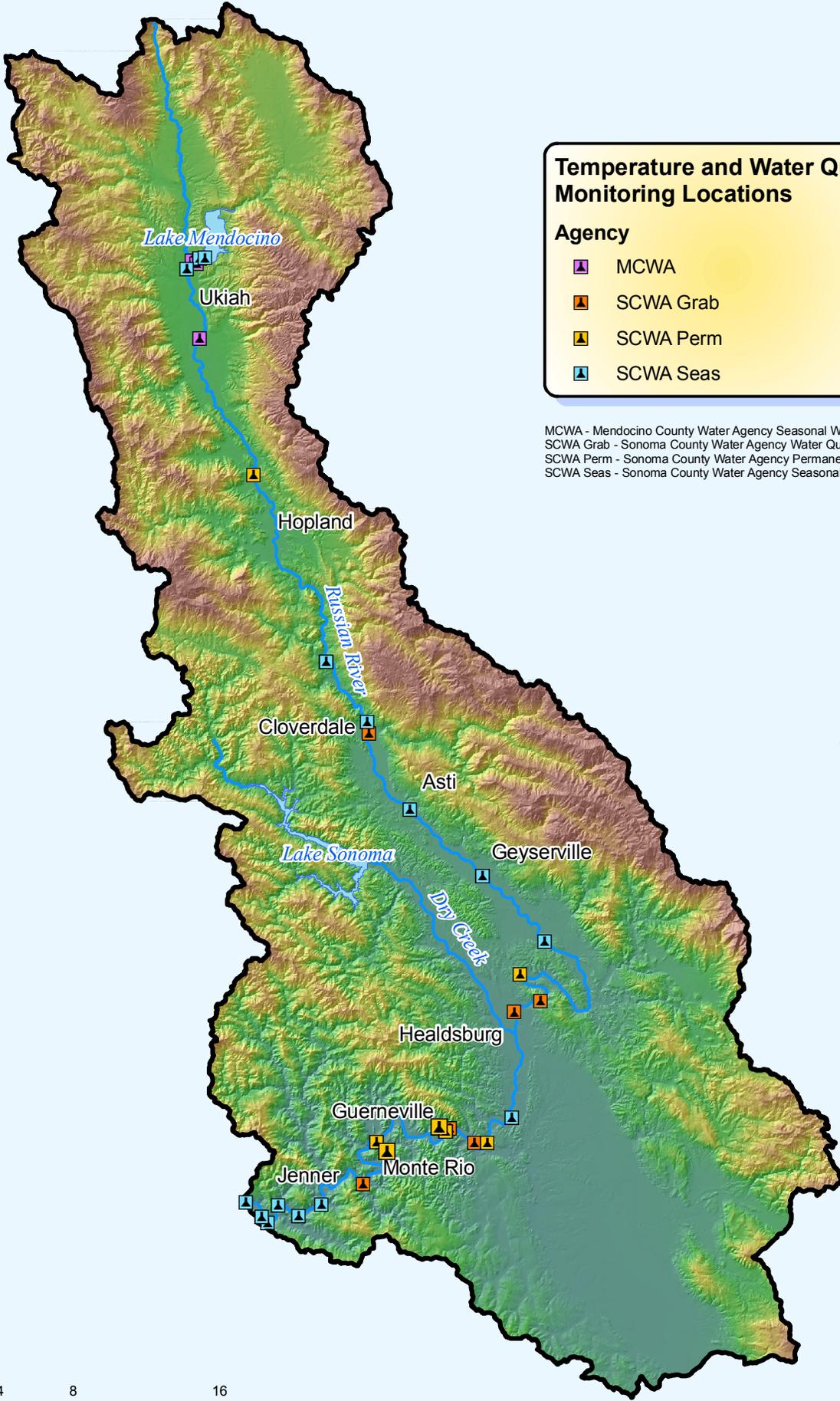
The NCRWQCB and the Agency also collaborated on vertical profiling of Lake Mendocino for temperature and dissolved oxygen at or near the tower structure. The profiling was conducted on a monthly basis and alternated between Agency and NCRWQCB staff.

Sonoma and Mendocino County Water Agency Seasonal Water Temperature Collection

In addition to temperature data collected by the Sondes, the Agency deployed seasonal water temperature sensors at Preston, Asti and Geyserville. In addition, the Mendocino County Water Agency (MCWA) deployed seasonal water temperature sensors at numerous locations throughout the watershed. In the Russian River they deployed sensors in several locations including the East Fork of the Russian River below Coyote Dam, in the West Fork of the Russian River below Lake Mendocino Drive, in the Russian River at Talmage Road and in the Russian River at Commisky Station Road. The MCWA has provided the raw data to the Agency and it is included in the electronic matrix.

Reporting

Upon receiving the bacteriological results the Agency updated its website with the newest data. Laboratory results from the nutrient and chlorophyll-a sampling were also posted on the Agencies website upon receipt of the written laboratory report. Links to online stream gage and Sonde data were also included on the Agencies website. Per the Order a written report will be submitted to the NCRWQCB and DEH summarizing all collected data by the end of December.



Temperature and Water Quality Monitoring Locations

Agency

-  MCWA
-  SCWA Grab
-  SCWA Perm
-  SCWA Seas

MCWA - Mendocino County Water Agency Seasonal Water Temp Locations
 SCWA Grab - Sonoma County Water Agency Water Quality Sampling Locations
 SCWA Perm - Sonoma County Water Agency Permanent Sonde Locations
 SCWA Seas - Sonoma County Water Agency Seasonal Sonde Locations



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Attachment B

Summary of Water Quality and Temperature Monitoring

Instrument or sensor based sampling	depth	temperature	DO	pH	turbidity	specific conductance	salinity	sampling frequency	telemetry?	duration
Location										
SCWA Permanent and Seasonal Sonde YSI Water Quality Samplers										
Lake Mendocino Outfall	x	x	x	x		x	x	1 hour	n	May - Oct
Westfork Confluence***	x	x	x	x		x	x	1 hour	n	upon install - Oct permanent
Hopland USGS site	x	x	x	x	x			15 min	y	permanent
RR near Cloverdale USGS site*	x	x	x	x	x			15 min	y	upon install - Oct
Alexander Valley Road Bridge*	x	x	x	x	x			15 min	y	upon install - Oct
Digger's Bend	x	x	x	x	x			15 min	y	permanent
Riverfront Park*	x	x	x	x	x			15 min	y	upon install - Oct
Mirabel (SCWA RDS Facility)	x	x	x	x	x			15 min	y	permanent
Hacienda Bridge	x	x	x	x	x			15 min	y	permanent
Johnson's Beach	x	x	x	x	x			15 min	y	permanent
Freezeout Creek	x	x	x	x		x		1 hour	n	April - Dec**
Heron Rookery	x	x	x	x		x	x	1 hour	n	April - Dec**
Sheephouse Creek	x	x	x	x		x	x	1 hour	n	April - Dec**
Bridgehaven	x	x	x	x		x	x	1 hour	n	May - Dec**
Patty's Rock	x	x	x	x		x	x	1 hour	n	April - Dec**
Mouth @ Jenner	x	x	x	x		x	x	1 hour	n	April - Dec**
*sondes at RR near Cloverdale, Alexander Valley Road Bridge and Riverfront Park are pending USGS installations										
**Dec removal is storm and high river dependant										
*** sonde at Westfork confluence is pending site access										
SCWA Seasonal water temp locations										
Preston		x						15 min	n	June - Oct
Asti		x						15 min	n	June - Oct
Geyserville		x						15 min	n	June - Oct
MCWA Seasonal water temp locations										
EF Russian River below dam		x						90 min	n	June - Oct
WF Russian River		x						90 min	n	June - Oct
Russian River at Talmage Rd		x						90 min	n	June - Oct
Russian River at Commisky		x						90 min	n	June - Oct
Grab Sampling Program										
Location	total coliform / E. coli	enterococcus	chlorophyll-a	temperature	DO	pH	turbidity	nutrients*	conductivity	Duration
SCWA Urgency Change Order Bacteriological, Nutrient and Water Quality Grab Sampling										
Lake Mendocino Outfall								x		May 28 - Oct 1
RR near Cloverdale USGS site	x	x	x	x	x			x		May 28 - Oct 1
Cloverdale River Park	x	x		x	x					May 28 - Oct 1
Geyserville Hwy 128 Bridge	x	x		x	x					May 28 - Oct 1
Alexander Valley Road Bridge	x	x	x	x	x			x		May 28 - Oct 1
Camp Rose Rd. (Fitch Mountain)**	x	x		x	x					May 28 - Oct 1
Healdsburg Veterans Memorial Beach**	x	x	x	x	x			x		May 28 - Oct 1
Steelhead Beach**	x	x		x	x					May 28 - Oct 1
Forestville Access Beach**	x	x		x	x					May 28 - Oct 1
Hacienda Bridge	x	x	x	x	x			x		May 28 - Oct 1
Johnson's Beach**	x	x	x	x	x			x		May 28 - Oct 1
Monte Rio Beach (multiple sites)**	x	x		x	x					May 28 - Oct 1
*nutrients include Ammonia-N, Nitrate-N, Total Organic Nitrogen, Total Phosphorous										
Note - SCWA samples Thursday weekly following Memorial Day until end of Order, daily sampling will follow acute exceedance of the California Department of Health Services - Draft Guidance for Fresh Water Beaches										
**The NCRWQCB and Sonoma County Environmental Health Department conduct seasonal bacteriological sampling at these locations weekly from the Tuesday following Memorial Day until the Tuesday following Labor Day										
SCWA Seasonal Estuary bacterial and nutrient grab sampling										
Freezeout Creek (below Duncans Mills)	x	x	x	x	x			x		June - Oct
Bridgehaven	x	x	x	x	x			x		June - Oct
Mouth @ Jenner	x	x	x	x	x			x		June - Oct
Note - SCWA samples once every three weeks for nutrients and total / E. coli and Enterococcus										
SCWA/NCRWQCB Vertical Temperature Profiles										
Lake Mendocino (2-4 locations)				x	x	x			x	May - September
Note - SCWA and NCRWQCB alternate conducting monthly vertical temperature profiles										