

PROTOCOL FOR CONDUCTING RUSSIAN RIVER BACTERIOLOGICAL SAMPLING AT SUMMER RECREATIONAL BEACHES

(Prepared by Cathy Goodwin, NCRWQCB - July 21, 1999, July 29, 1999, May 2005, and May 22, 2007)

Each summer, bacterial water quality monitoring is conducted at summer recreational areas along the Russian River as a joint effort between the North Coast Regional Water Quality Control Board (Regional Board) and the Sonoma County Department of Health Services, Division of Environmental Health (SCDHS). The purpose of this document is to describe the sampling plan and protocol to be used for the bacteriological sampling. Staff from the Regional Board and SCDHS coordinate prior to the beginning of each summer season to determine sampling dates and to review sampling procedures.

The *Water Quality Control Plan for the North Coast Region* (Basin Plan) describes beneficial uses and water quality objectives for waters of the North Coast Region. Beneficial uses of the Russian River include, municipal and domestic water supply, agricultural and industrial water supply, recreation, commercial and sport fishing, warm and cold freshwater habitat, wildlife habitat, and fish migration and spawning. Bacteriological sampling is conducted to protect the recreational beneficial use.

The Basin Plan includes water quality objectives for bacteria as follows:

“The bacteriological quality of waters of the North Coast Region shall not be degraded beyond natural background levels. In no case shall coliform concentrations be degraded beyond natural background levels. In no case shall coliform concentrations in waters of the North Coast Region exceed the following:

In waters designated for contact recreation (REC-1), the median fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed 50/100 ml, nor shall more than ten percent of total samples during any 30-day period exceed 400/100 ml.”

METHODS

Sampling Sites

The following sites are sampled each summer:

1. Camp Rose (Healdsburg) - This beach is located along Fitch Mountain in Healdsburg. To get there take Healdsburg Ave. to Matheson Ave. at the south side of Healdsburg Square. Matheson turns into Fitch Mountain Road. Turn right onto Camp Rose Road and park. Follow the trail down to the river and sample near the well head on the gravel bar at the edge of the river. Wade out into the center of the flow to collect the sample.

2. Healdsburg Memorial Beach- Pull into the County Park parking lot. Sample in front of lifeguard stand 3 at the downstream end of the swim area. Wade into the water as far as possible.
3. Sunset Beach. This beach is located immediately downstream of Hacienda Bridge. From Healdsburg follow Westside Road approximately 12 miles to Forestville. Turn left onto Sunset Avenue.
4. Johnson's Beach (Guerneville)- The sampling site is located downstream of the children's swim area and upstream of the bridge. The sampling site coincides with the upstream end of the snack bar. Wade into the water as far as possible.
5. Monte Rio - The sampling site is downstream of the children's swim area. Some summers there is a dock at the sampling location and other times the gravel bar extends out into the water. Wade into the water as far as possible.
6. Steelhead Beach – Take River Road
7. Oddfellows Bridge (Guerneville)- Take River Road to Oddfellows Park Road. Park in the space before you cross the bridge. Sample at the small sandy beach upstream of the bridge. Wade out into the center of the flow to collect the sample. [NOTE: WE WILL NOT BE SAMPLING THIS BEACH IN 2007]

Sampling Frequency

Samples are collected one time each week, preferably on the same day and at the same time each week. Weekly samples are necessary in order to compare the sample results to existing BasinPlan standards for fecal coliform (five samples must be collected each 30 day period on a continuous basis throughout the summer) and/or State Department of Health Services Guidelines for total coliform, E. coli, and Enterococcus.

Sample Collection

Samples must be collected in aseptic containers prepared by the analytical laboratory. Samples should be collected in the afternoon since this is the time of day the beaches are in highest use. Samples should be collected at approximately the same time each week. Samples should be collected midstream when flow conditions allow. When this is impossible due to water depth, samples should be collected as far from shore as the sampler can wade (in hipwaders or shorts) in an area with well-mixed water.

The sample container must be opened and closed carefully so as not to introduce bacteria into the container (e.g., keep fingers away from opening). The container is dipped down and up in a smooth sweeping motion through the water column against the direction of the flow. When this is done correctly, the container is submerged approximately 9 inches below the water column before it comes back up. Store the container on ice for transport to the laboratory.

All sampling activities must be recorded in a field notebook or on the attached sampling sheet. Entries must include the sampling location, sampling date and time, personnel on the sampling team, calibration of field instruments, weather conditions, records of field measurements (air and water temperature, pH, conductivity and dissolved oxygen), and field observations (e.g., activities, sources, or conditions that may influence the bacteria results, including numbers of people, animals and birds in and near the river; physical observations about the river, etc.).

Sample Delivery

Samples must be delivered to the analytical laboratory within six hours of the time that the first sample is collected.

Normally, samples are delivered to the Sonoma County Health Department Laboratory at 3313 Chanate Road, Santa Rosa. They are located in the white building on the left hand side as you pull into the Sutter Hospital Parking lot. The contact at the SCHD lab is Carol Dubay, 565-4711.

Occasionally, samples are taken to the Brelje and Race Analytical Laboratory located at 425 South E Street, Santa Rosa. The contact person there is Ann Hill, 544-8807.

Sample Analysis

The SCHD lab analyzes the samples for total coliform and E. coli, using the Colilert method, and Enterococcus, using the Enterolert method. Sample results should be received by telefax on the day following sample delivery.

Samples may occasionally be analyzed at Brelje and Race Lab for total and fecal coliform using the multiple-tube fermentation methods 9221B and 9221E. Sample results should be obtained by telephone or telefax a week following sample delivery. Written reports take two or more weeks.

Quality Assurance/Quality Control

The Sonoma County Health Department laboratory requires us to fill out a laboratory submittal slip for each sample.

Chain-of-custody forms must be completed on all sampling dates, if samples are submitted to the Regional Water Board's contract laboratory.

Data Storage and Analysis

Regional Water Board staff enter all physical and bacterial data in an Excel spreadsheet program and prepare graphs of the data (primarily showing median fecal coliform concentrations plotted against sampling date). Data is carefully reviewed to identify compliance with the Basin Plan and/or DHS standards and to determine if exceedances indicate any trend of water quality degradation.

The sampling results must be posted to the Regional Water Board website as soon as possible after the results are received so that the public has timely access to the data.

SCDHS staff also maintain copies of the data.

**Procedures for Russian River Bacteriological Sampling– Summer 2007
(Revised May 22, 2007)**

Preparing To Go

1. Call the analytical laboratory if the sampling day needs to be changed. I have told the lab that sampling will be done on Tuesday of each week, with samples being dropped off by 3:00 p.m., unless we notify them otherwise
 - a. Our routine samples will be analyzed by the Sonoma County Health Department Laboratory at 3313 Chanate Road (across the parking lot from Sutter Hospital). Our contact there is Carol Dubay 565-2711.
2. Check your supply of sampling containers. For our routine weekly sampling, sampling containers should be picked up at the Sonoma County Health Department Laboratory. We should be picking up sample bottles from the lab when we are here dropping off samples.
3. Sign out a vehicle at least a week ahead. Jeeps work well for this type of sampling.
4. Check field supplies to make sure you have everything on the attached list.

Pre-Sampling Routine (day of sampling)

1. Put blue ice (or ice in heavy bags or frozen water bottles) in ice chest. There should be sufficient ice to keep samples cold for 4 or 5 hours in a hot vehicle.
2. Calibrate Datasonde and record calibration results on calibration record sheet.
3. Bring a cell phone so that you can phone into the office if you have any problems or questions. John Short keeps our Unit cell phone in his office. If it is not available, you may check out a cell phone from Janet Mahoney. When you sign out on the Sign-Out Board, identify the cell phone number so that you can be reached if needed.

In the Field

1. We will sample six sites this summer: Camp Rose, Healdsburg Memorial Beach, Steelhead Beach, Sunset Beach, Johnson's Beach and Monte Rio. These are identified on the maps in my clipboard. We sample at the same spot on each beach every week.
 2. Bring the ice chest, Datasonde, bacti sampling bottle and turbidity container to the sampling location. **The bacti sample must be put in the ice chest immediately after it is collected.**
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3. As soon as you get to your sampling spot, set the thermometer out in a shady spot (off the ground) to record the air temperature. Record observations on the field sheet (how many swimmers/bathers, presence of ducks, birds or dogs in or above water, dirty diaper on bank, algae, etc.)
4. Two containers need to be filled at each sampling site: bacti container and turbidity container.

Enter the water walking slowly upstream so that you minimize disturbance of sediment. By walking upstream at an angle to the stream bank, small amounts of disturbed sediment should flow downstream if the water is flowing. In impounded areas, any disturbed sediment will move in all directions. You must be watching so that you don't dip your sample into an area with disturbed sediment.

- a. The sampling containers for collecting the bacti samples are specially prepared so that they are aseptic. The container must be handled carefully so that your fingers don't touch the rim or interior of the container.

To sample, you should be facing upstream. The goal of the sampling technique that follows is to avoid sampling the surface film of the water. Remove the lid of the bacti container and hold the bacti container comfortably in your hand with the opening of the container pointed down. The container is dipped down and up in a smooth sweeping arc through the water column against the direction of the flow.

When this is done correctly, the container is submerged approximately 9 inches below the water column before it comes back up. If the water depth is too shallow then sample midway between the surface and bottom and avoid stirring up bottom sediments. The sampling container should be filled to the 100 ml line on the bottle. You can have more, but not less water. The bottle should have approximately ½ " to 1" of air space. Carefully put the lid back on the container making sure that is completely sealed.

Place the container in a clean plastic bag and store the container on ice in the ice chest for transport to the laboratory.

- b. Fill the turbidity container after rinsing it with river water.
5. Put bacti sample in ice chest.
 6. Record the Datasonde readings (water temperature, dissolved oxygen, pH, conductivity) on the field sheet.

7. At the first sampling site, pour the contents of the field sampling container into the bottle marked "REP". You will use this water at the end of your sampling day to check the calibration of the pH stick and conductivity meter.

Post-Sampling Routine

1. Deliver samples to the laboratory. Fill out one lab slip for each sample. The Sonoma County Health Department and our contract lab use different lab slips.

If samples are analyzed through our contract laboratory a Chain of Custody form must also be filled out following the attached example. When you drop the samples off at the lab, sign it, the lab tech will sign it and return the original to you. A copy of the Chain of Custody form must be faxed to Robert Butler at Sequoia Analytical (fax number 792-0342). Make a Xerox copy of the Chain of Custody, write the cost of sampling on it and give it to Lynda Dougherty at our office.

2. Calibrations. Perform a post-calibration check of the Datasonde when you return to the office.

Note: More procedural details are available in 'Protocol For Conducting Russian River Bacteriological Sampling At Summer Recreational Beaches', revised July 29, 1999