Community Clean Water Institute

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February 28, 2007

Mr. Bruce Gwynne
North Coast Region Water Quality Control Board
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

Dear Mr. Gwynne,

Enclosed are three years of water quality data collected through Community Clean Water Institute's Volunteer Water Quality Monitoring Program in response to the State Water Resources Control Board's Public Solicitation of Water Quality Data and Information for the 2008 Integrated Report (303-d/305-b).

Included in this submission are a narrative description of the project (below), methods, data management and quality control (appendix A), metadata (three Excel files), summary statistics, selected graphs and some commentary by sub watershed (appendix B), and site maps (appendix C). Also consider visiting our website, each sub-watershed has a dedicated page describing the project activities.

This submittal is intended to assist the North Coast Water Quality Board in determining where TMDL initiation is appropriate within the Russian River and Salmon Creek watersheds. We expect it will compliment other information gathered to make a comprehensive assessment.

Looking ahead towards future 303-d solicitations, we plan to increase efficiency by coordinating with other monitoring groups. This cooperation will serve to expand the usability of data collection efforts, create a uniformed, comprehensive monitoring plan and pool scarce resources. We hope to work with the North Coast Water Board continuing to build a comprehensive and constructive water quality monitoring program.

Feel free to contact me with questions or to discuss CCWI's submittal.

Sincerely,

Sarah Shaeffer
Program Director

Program Description

The project contact is Sarah Shaeffer, Program Director of CCWI:
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Certifying the accuracy of the data is Nels Worden, Technical Advisor and Board member of CCWI. Nels holds a Laboratory Analyst, Grade II certification and is currently with the Sonoma State University Chemistry Department.

For bibliographic purposes, use: Community Clean Water Institute, www.ccwi.org

Community Clean Water Institute's Volunteer Citizen Water Quality Monitoring Program supports community members in investigating Sonoma County's surface waters. The program objective is to involve local citizens in gathering baseline indicators, investigate potential source of pollution, and identify streams of concern in need of further study. The program produces useful data along with providing education and stewardship opportunities to the public. CCWI acts as custodian of water quality equipment, data management, trainer and coordinator of the monitoring program. Our volunteers are field operators who use standardized procedures to perform water quality tests at 50 sites throughout Sonoma County. The program began on Dutch Bill Creek in 2002 and has expanded to other watersheds (see list below). Our goal is to have a positive affect of the health of our watersheds and community.

CCWI staff train all volunteers and provides a guidance handbook with instructions and information. Staff spends the first three monitoring trips with the volunteer at their designated site/s in order to train and assess performance. Follow up training is provided needed or as new equipment or methods are introduced is also provided. Staff and volunteers check in and review the field datasheet both before and after monitoring when the volunteer picks up and drops off the equipment, allowing face to face communication time. The field datasheet serves as a chain of custody, see example in Appendix A.

Field sampling includes dissolved oxygen, pH, conductivity, turbidity and water and air temperature, with some sites additionally measured for flow. A grab sample at the time of field testing is returned to CCWI for total phosphorous and nitrate-nitrogen analysis. Less frequently preformed analysis includes total coliforms, e. coli, enterococcus and ammonia. For a detailed account of methods for sample collection and handling, data management, record keeping and field and laboratory analysis, refer to Appendix A included in this submission.

Sampling parameters and methods were chosen for ease of use, durability, safety and cost considerations. CCWI's equipment is used by up to 30 operators each month, with

additional handling by school groups. Our program uses methods that reduce the opportunity for operator error and instruments with inexpensive replacement parts. Our goal is monthly monitoring of each site. Due to the challenge of coordinating between volunteer monitors' schedules and absences some fluctuation in time of day, month, and number of sampling events per year occurred. Additionally, varying success with recruitment for replacement volunteers for a particular site can cause temporal gaps or a loss of a site.

Sites are selected on the following rational:

- Safe access,
- permission to cross private property is granted,
- location has a uniform reach for flow measurements,
- sample can be taken in main current or where homogeneous mixing of water occurs,
- sample is representative of that portion of the waterbody,
- location complements or supplements historical data,
- location represents an area that possesses value for fish and wildlife or recreational use,
- Volunteer or watershed group interests.

This submission includes data only from those sub-watersheds that have at least one year of sampling completed. Therefore missing from the dataset are recently added the watersheds of Cheney Gulch, Americano Creek, Windsor Creek, Atascadero Creek, some discontinued sites and other isolated sampling events.

Russian River Watershed		
Austin Creek	3 sites	Lower section of the mainstem from below Cazadero to confluence with Russian River
Dutch Bill Creek	6 sites	Upper half of mainstem from Occidental to fish ladder; one site on Lancel Creek, a tributary
Green Valley Creek	7 sites	Entire mainstem from Harrison Grade and Green Valley Rd to Russian River confluence
Laguna de Santa Rosa	5 sites	From Stony Point Rd to the Sebastopol Community Center, one site on Colgan Creek
Mark West Creek	3 sites	One site at the mouth, one near Hwy One, the last near St. Helena Rd and Calistoga Rd.
Pocket Canyon Creek	4 sites	Mainstem from May's Canyon Rd to Santa Nella House, one tributary site, just turbidity
Lower Russian River	7 sites	From Odd Fellow's Park downstream of Rio Dell to the river mouth in Jenner
Santa Rosa Creek	1 site	Olive Park along Prince Memorial Greenway
Upper Salmon Creek Watershed		
Fay Creek	1 site	Off Fitzpatrick Lane
Salmon Creek	2 sites	From Bittner Rd to Salmon Creek School on Bohemian Highway
Tannery Creek	1 site	Off Jennifer Ln and Joy Rd
Thurston Creek	1 site	At Joy Rd
Westwood Creek	1 site	At Bittner Rd.

* These are currently active sites. Data from sites no longer monitored within the above watersheds were included in the submission and analysis.
*Detailed information on site location is found in the Excel metadata files under "Location" tab. Also visit our website at www.ccwi.org/issues/index.html to view concise descriptions, photos, maps and monitoring plans for each sub watershed.

Sonoma County experiences a dry and rainy season each calendar year. Dry summer weather increases temperatures, reduces flow and dissolved oxygen, and can increase conductivity and algae growth. Winter conditions bring turbidity, nutrients and bacteria from runoff and ground saturation, in addition to lower temperatures and higher dissolved oxygen and flows. These trends are easily identifiable in our data.

Monthly testing is useful in showing these phenomena and for identifying streams or areas that fall outside the norm or the expected for the season, and for indicating where ecosystem, fish or human health may be at risk. However monthly monitoring misses the daily fluctuations in temperature, dissolved oxygen, bacteria, nutrients and turbidity that occur. Nutrients and turbidity in particular may spike to troubling levels during rain events, then fall back to baseline within days or even hours. The resolution of monthly monitoring can miss most or all of these events during a given rainy season, leading to an incomplete picture.

For these reasons, we suggest that care be taken in interpreting those parameters that fluctuate rapidly, dissolved oxygen, turbidity, temperature and nutrients. Supplemental information is critical to the data's use, and further testing may be indicated. Though standards may be met in our dataset, the waterbody may still be impaired, or vice versa.

In regards to CCWI's testing, some generalities may be made. Depending on the time of day, temperature and dissolved oxygen may present the worst or best case scenario. Consistently low dissolved oxygen readings at a particular site visited mostly during the afternoon could indicate a problem, while moderately elevated temperatures during summer afternoons may not. For turbidity, nutrients and bacteria, even just a few exceedances may indicate a larger problem for a particular waterbody. The probability of finding 250 NTU turbidity, 3,000 MPN bacteria, or 2 mg/L nitrogen in a sample size of 12 days out of an entire year is not necessarily trivial or an outlier. This is particularly enhanced when considering the effects of seasonality on these fluctuating parameters.

We hope to address some of these information gaps with continuous type monitoring. This summer we plan to begin use of hobotemps and our new luminescence dissolved oxygen meter to run 24 hour logging events to better understand the daily cycle oxygen and temperature.