Water Quality Testing 2004

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Sewage pipes often break and waste gushes into our creeks. More insidious, a leak develops and sewage seeps unnoticed into summertime pools. In these isolated freshwater pools, waste contributes to a nutrient-rich soup, reducing oxygen necessary for aquatic life. In the tidal reaches of creek, waste is hazardous to swimmers.

Reports of these spills prompted a number of volunteers to take action. Friends, in cooperation with EPA Region 9 Laboratory in Richmond, this summer completed a third season of monitoring our creeks to determine the presence or absence of coliform bacteria, *E. coli* and *Enterococcus*, (components of sewage) and to measure their concentrations. The results showed high concentrations of bacteria in the tidal section of creek, confirming earlier findings from the years 2003 and 2004. This record is helping pinpoint areas where there are leaky sewers, leaky septic systems and animal waste.

E. coli and *Enterococcus*, the bacteria of concern, are harmless but relatively easily-detected, and found in the guts of warm-blooded animals (including birds); however, these bacteria are often associated with bacteria pathogenic to humans, and are therefore indicators of creek problems caused by the impacts of domestic pets, wildlife, and leaking sewers. *E.coli* was used as an indicator in freshwater reaches of creek while *Enterococcus*, more tolerant of saline conditions, was usually measured in tidal sections of creek near San Francisco Bay.

Here's a recap of earlier results.

SUMMER OF 2003: We tested nine sites in the watershed and found that Deer Park Creek in Fairfax was the only freshwater site that failed to meet state noncontact recreation standards, but results may have been an aberration because the creek was shallow with isolated puddles, which made it difficult to avoid stirring up sediment laden with bacteria. Larkspur Creek, the only site tested for *Enterococcus* in the tidal section of creek did not meet the criterion for EPA full-body contact for saltwater.

WINTER OF 2004: We tested at 13 sites. All freshwater sites met state non-contact standards, including sites just downstream of stables. This was no surprise since *E. coli* concentrations in creeks are generally lower in winter when there is more dilution of bacteria. However, in the tidal section of creek, at both Larkspur Creek near Doherty Drive (as before) and Corte Madera Creek just downstream of Bon Air Bridge, bacteria concentrations of *Enterococcus* far exceeded acceptable EPA bathing standards.

During summer of 2004, we tested eleven sites throughout the watershed. In an effort to pinpoint sources of *E. coli* in the tidally influenced section of creek, we chose to sample six sites on Corte Madera and Larkspur creeks, since these creeks had the highest concentrations of bacteria during the previous test period. We sampled just downstream of College of Marin's Ecology Study Center, upstream of Bon Air Bridge and at South Eliseo Drive. On Larkspur Creek we tested at Cane Street, Meadowood Avenue and Doherty Drive.

Of the three Corte Madera Creek sites, the site below Bon Air Bridge had the highest concentrations of bacteria. The mean concentration expressed as the most probable number of *E. coli* (MPN) was 290 MPN, exceeding the state bathing standard of 200 MPN. Along Larkspur Creek the Doherty Creek site was also high with a concentration of 140 MPN. It's still not clear why the Bon Air site has the highest concentrations of *E. coli*. High concentrations could be due to large numbers of wintering geese being fed across from our test site, a leaky sewer main, or leaky sewer laterals below the bridge. Future testing downstream may help us isolate the problem.

We compared concentrations during incoming and outgoing tides at the Corte Madera Creek and Larkspur Creek sites and found that when tides ebb, concentrations of *E. coli* are generally higher. Perhaps during high tides sediments laden with bacteria are mobilized and as the tide goes out there is less water to dilute the bacteria. However South Eliseo was the

exception, since at this site *E. coli* concentrations were higher during incoming tides. To further pinpoint pollutant sources when tides are flowing, future samples should be taken at one site upstream of Bon Air Bridge and additional sites downstream.

The remaining five sampling sites were located on San Anselmo Creek at Cascade Canyon Preserve in Fairfax, Fairfax Creek at Peri Park, Sleepy Hollow Creek at Drake High School, Sorich Creek on Nokomis Avenue and Corte Madera Creek behind Ross Town Hall. No freshwater sites exceeded the state's non-contact standard of 2000 MPN; however Sorich Creek was right at the limit, and Sleepy Hollow Creek followed close behind with concentrations of 650 MPN.

Clearly, the more samples we take the more certain our data will be. Friends will continue testing, with the next five week sampling period beginning January 17. If you are interested in collecting samples or finding out more about the program, call Carole at 415 454-8608.

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