

# Making Our Water Fit To Drink

(First of three articles.)

By **DON RIGHETTI**  
Sentinel Staff Writer

"Water, water everywhere,  
nor any drop to drink."

Everybody in Santa Cruz could be in the same boat with the Ancient Mariner if the city's water department weren't in the business of making sure our water is fit to drink.

The American Water Works Association states, "Ideally, water delivered to the consumer should be clear, colorless, tasteless and odorless." The association also sets standards for health factors and protection of plumbing, along with other quality guidelines.

All water systems in the United States, with respect to matters that concern health, defer to the U.S. Public Health Service and the medical profession for standards. With respect to toxic substances, the public health service standards are set as a goal because they

provide very broad safety factors.

In addition to the above standards, observed Water Department Director Wes Webber, the city water department sets goals for other factors which are considered to be of importance by the American Water Works Association. These include turbidity, color, taste and odor, iron and manganese content, alkalinity and hardness.

"In order to make certain that standards are met and goals are approached, the water department engages in a quality control program which starts with the source at the reservoir and stream, continues through the water treatment plant and extends into the distribution system to the point where the water is delivered to the customer," Webber said.

The program is under the direction of Calvin Cross, water quality control supervisor.

Water quality control work at the city's Loch Lomond reser-

voir consists of evaluating and controlling the manganese content problem, the use of aeration as a quality control tool and the evaluation and control of algae growth.

Control of manganese is important because it causes staining of plumbing fixtures, rust deposits and brown water, Cross pointed out. Algae control is important since the little plants are sources of taste and odor.

The program to find means of improving water quality at Loch Lomond has been underway for two years. The water men have found that each year in the summer the manganese in the water begins to increase and can get as high as five parts per million. The U.S. Public Health maximum allowance for that substance is only .05 parts per million.

But manganese is difficult to remove and treatment can be expensive.

The water department's solu-

tion? Get to the manganese before it forms in the reservoir and eliminate the need for special treatment at the filtration plant.

Manganese increases during the summer because the sun heats a top layer of water about 20 feet deep, but leaves a cold 140-foot layer below. The two layers don't mix, and as a result the cold layer soon loses its air supply. When that happens, chemical and biological processes begin to increase the manganese content.

There are five outlets to draw water from the reservoir, all of them normally at the level of the lower layer.

Early in the season the manganese is not a problem, since the high concentrations are on the bottom. But later in the year the entire bottom layer will be high in content.

To lick the problem the city installed an aeration system to mix the water in the top 90

feet of the reservoir. There are still two layers as before, but now the top one is 90 feet deep and includes the level of the outlets.

The manganese stays in the bottom until the fall turnover, a natural process which mixes the entire reservoir and destroys the layers. In the spring the whole process starts over again.

As a result of the aeration process, no special treatment for manganese at the filtration plant has been required for the past two years.

The study of manganese behavior, however, is only a part of the water quality control program at Loch Lomond. Throughout the year the water department samples and runs tests for algae, iron, manganese, color, turbidity, oxygen, temperature and bacteriological quality.

(Next: The battle against algae.)

2-17-70