

November 21, 2008

Where does it go when you flush?

Neal Ross | Sonoma Valley Sun

Flush a toilet almost anywhere in Sonoma Valley, and a short while later the contents will travel a vast system of gravity-fed pipes to gurgle through the “ugly bars.”

That’s what workers at the Sonoma Valley Treatment Plant at the southern end of Eighth Street East unofficially call three 3/4-inch grates, which are the first stage in turning brown water clear. “Sewage gets a bad name, but water’s water,” said plant director Hody Wilson. “And in California, every drop counts.”

Wilson explained that an average of more than 2.5 million gallons of raw sewage enters the plant each day during dry weather, enough to fill a one-acre pool 11 feet deep. That flow varies during the day and can increase almost tenfold in wintertime. The treated water, or “effluent,” is discharged into Schell Slough on San Pablo Bay between Nov. 1 and April 30, and is used for irrigating Carneros hayfields and vineyards during the rest of the year.

But that’s after the sewage, or “influent,” passes through three different treatment processes – physical, biological and chemical. The first of these, called the headworks, begins at the infamous “ugly bars.”

“The bar screens take out the big chunks and rocks and solids ... the rags, and money, and toys,” Wilson said with a seen-it-all twinkle in his eye. “Twenty-dollar bills come through all the time.” Whatever gets filtered out is then mechanically washed and dried, loaded via conveyor into a large trash bin, and eventually hauled to the dump. Meanwhile, the influent passes along a “wetwell” (a narrow concrete ditch running alongside the headworks) and through one of five chest-thick pipes snaking through a 40-foot by 40-foot concrete cube. Two other pipes convey their contents slightly uphill to the circular “grit chamber” where they slowly swirl into a thick slurry, which is eventually dried and sent to the landfill. Although the liquid is still brown and acrid, Wilson said it’s “over 99 percent pure water.”

“You try to settle out and remove any particles that are the density of an eggshell or heavier ... so that we’re primarily sending water and dissolved solids to the aeration basins,” Wilson said.

The aeration basins are the biological part of the processing routine. Sprawling pits, each about as large as a good-sized house lot, swirl with a foamy brown mixture of water, sewage and bacteria. Hot-to-the-touch pipes pump compressed air into the mass, feeding the muck-eating bugs that are the backbone of most modern water treatment plants.

“You’ve got to keep it circulating, you’ve got to give it oxygen, because they’re working,” Wilson said. “Otherwise, this would be a stinky mess.”

After the bacteria has done its work, the flow next bubbles up through the middle of the plant’s two clarifiers – open-top circular tanks 140 feet in diameter, in which the bacteria mass settles to the bottom (eventually to be pumped back to its roiling home) and floating grease is removed by automatic skimmers.

The next piece of the processing puzzle sends the flow through a dozen white octagonal filters. Chlorine gas is pumped in to disinfect the water, which then comes to rest in rectangular contact chambers that look and smell like a series of long, narrow swimming pools, some of which overflow into each other.

“On a sunny day [you] can flip a quarter in there and you can tell whether it’s heads or tails,” Wilson said.

At this point, the water has been thoroughly tested for clarity, coliform bacteria, and even excess chlorine (which is removed before discharge by a sulfur dioxide solution) and is ready to be released back into the wild. Wilson said the modern process is a far cry from a century ago, when epidemics forced communities to take a long hard look at their sewage.

“Probably, wastewater treatment plant operators have done more to cut down disease than anyone,” he said, “just by treating the sewage instead of having it go into streams and lakes.”