



California Regional Water Quality Control Board Central Valley Region

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November 4, 2010

The Honorable Darrell Steinberg
Senator
State Capitol, Room 205
Sacramento, CA 95814

SACRAMENTO REGIONAL COUNTY SANITATION DISTRICT PROPOSED NPDES PERMIT

Dear Senator Steinberg:

Thank you for your letter dated October 7, 2010 regarding the Central Valley Regional Water Quality Control Board's (Central Valley Water Board) proposed National Pollutant Discharge Elimination Systems (NPDES) Permit for the Sacramento Regional County Sanitation District (SRCSD).

The proposed Permit has significant ramifications both for the ecologic health of the Delta and the SRCSD. The proposed Permit is based upon Water Board staff's evaluation of the available science and application of state and federal regulations. Central Valley Board staff is currently reviewing more than 150 comment letters on the proposed Permit, including a number of new technical evaluations that could change the staff recommendations made to the Board members. The review and consideration of comments is not complete. The following answers to your questions are based upon the information used for development of the tentative Permit that was circulated for public review and comment.

BACKGROUND

The Central Valley Water Board, in conjunction with the State Water Resources Control Board and the other eight Regional Water Quality Control Boards, are jointly responsible for preserving, enhancing and restoring the quality of California's water resources. The Regional Water Boards make critical water quality decisions for their regions, including issuing waste discharge requirements and NPDES permits, determining compliance with those requirements, and taking appropriate enforcement actions. In making these critical water quality decisions, the Regional Water Boards must ensure that the decisions protect the beneficial uses of the waterbodies and are consistent with state and federal requirements. The Central Valley Region is the largest and most diverse region stretching from the Oregon Border to the northern tip of Los Angeles County. It comprises 60,000 square miles, or approximately 40 percent of the state, and water within the Central Valley region provides more than 50 percent of the state's total water supply, providing drinking water for 25 million Californians and irrigation water for millions of acres of farms in and out of the Central Valley.

California Environmental Protection Agency

The Sacramento-San Joaquin Delta is home to over 280 species of birds and more than 50 species of fish, making it one of the most ecologically important aquatic habitats in the State. The District's discharge is within designated critical habitat of the Sacramento River for five federally-listed fish species including winter and spring-run Chinook salmon, Delta smelt and green sturgeon.

The District currently discharges about 145 million gallons per day of treated wastewater to the Sacramento River. The discharge accounts for over 60% of all the municipal wastewater discharged to the Delta. The District's discharge of domestic sewage contains 14 tons per day of ammonia, and is the major source of ammonia to the Sacramento River and the Delta. The average annual ammonia concentration in the River increases 11.5-fold in the River below the District's discharge. The Delta has been listed as an impaired waterbody for unknown toxicity. The SRCSD discharge contains levels of toxicity that are harmful to aquatic life. The District's discharge is within the natural habitat area of the Delta smelt. Delta smelt populations have significantly declined since the early 1980's resulting in the smelt being listed by the U.S. Fish and Wildlife Service as an endangered species in 2010.

The Delta has been listed as an impaired waterbody for methylmercury. The SRCSD's discharge is the single largest contributor of methylmercury of all wastewater facilities within the Delta. The District's discharge contributes 8% of the methylmercury load in the Sacramento River during wet weather flows, and up to 35% of the load during dry weather flows. Mercury is a potent neurotoxin and methylmercury is the most toxic form of this metal. Human Health Advisories have been issued for the Delta warning against the consumption of mercury-contaminated bass. Research by Central Valley Water Board staff has found that wastewater facilities with advanced treatment have significantly lower methylmercury discharges.

RESPONSES TO QUESTIONS

The following are specific responses to your questions.

- 1. Please provide some historic and regional context for the board's proposed permit for SRCSD. What requirements have been imposed on other facilities in the region and throughout the state? Are they as stringent as those proposed for the district? Is there any dispositive information on the environmental benefits and economic costs associated with conditions imposed on other facilities?**

The District's treatment plant became operational in the early 1980's, collecting the wastewater from more than 20 small treatment systems into a single wastewater treatment plant. The level of treatment provided today – secondary biologic treatment with chlorination disinfection – has not changed in 30 years. Over half of the treated municipal wastewater discharged into the Delta is discharged by SRCSD.

The requirements in the Central Valley Water Board's proposed Permit for SRCSD are common to most small and large wastewater treatment plants that discharge to inland surface waters across the State. The tertiary filtration limits proposed for SRCSD are

NOT MORE STRINGENT than the limits prescribed for any treatment plant needed tertiary filtration. All other large wastewater treatment plants in the Delta (Lodi, Manteca, Stockton and Tracy) have Tertiary Filtration to remove pathogens, and nitrification to remove ammonia. All of these treatment plants except Stockton also have nitrogen reduction, although to a lesser degree than proposed for SRCSD. Lodi, Manteca, Stockton and Tracy have already completed wastewater treatment plant upgrades and the effluent that they are discharging is much cleaner than the SRCSD effluent. Tertiary filtration for pathogen removal is the treatment level needed if the wastewater is going to be recycled. *All large wastewater treatment plants in the Delta, with the exception of the Sacramento Regional facility, already provide tertiary filtration treatment.*

The treatment upgrades at Lodi, Manteca, Stockton and Tracy have significantly reduced the pathogens discharged to Delta waters, reduced the oxygen demand on Delta waters, overall reduced the loading of heavy metals and mercury to the Delta, and reduced aquatic toxicity caused by ammonia. Ammonia removal at the City of Stockton in particular has shown significant improvements in water quality. Historically there seasonally was extremely low dissolved oxygen in the San Joaquin River at Stockton, caused, in part, by the ammonia in the Stockton discharge. The low dissolved oxygen harmed both resident and migrating fish in the San Joaquin River. Since Stockton began removing ammonia, the extremely low dissolved oxygen events have not occurred.

Regarding the economic impacts of the advanced treatment, the advanced treatment certainly costs more to construct and operate than SRCSD's current treatment system. Lodi, Manteca, Stockton and Tracy have constructed and are operating similar advanced treatment systems and have not suffered significant adverse economic impacts as a result of these upgrades. The exact cost of SRCSD to upgrade depends in part on how much of the existing treatment facility can continue to be used and the exact type of treatment SRCSD chooses. SRCSD's cost estimate includes microfiltration (which is a more advanced and more expensive form of tertiary treatment than used by the other Delta dischargers), and Ultraviolet Light disinfection (which is used by many treatment systems, such as Tracy and Roseville, but is NOT required by the staff-recommended permit). This issue is addressed in greater detail in the response to question 4.

- 2. The District and other parties state that the filtration requirements of the permit "are excessive and will provide no measureable benefit to public health." Please explain what the requirements are, the basis for their imposition, and the benefits they provide.**

The proposed Permit would require Tertiary Filtration of the effluent to produce a pathogen-free effluent, eliminating the risk of someone getting sick from contact the wastewater. Generally Tertiary Filtration is required when there is little dilution available and there is a public health risk to the public coming into contact with the wastewater or consuming crops irrigated with the wastewater. When there is some level of dilution available, the Water Board normally consults with the California Department of Public

Health (CDPH) on the appropriate level of disinfection to protect public health. In SRCSD's case there is dilution in the Sacramento River, but it is a very large discharge and there is a very high level of body contact recreation, crop irrigation, and drinking water use of the River near the discharge and throughout the Delta. Thus, in developing the proposed Permit, we consulted with CDPH and required that a health risk assessment be conducted by SRCSD. The result of the study conducted by SRCSD indicated that, under conservative conditions, the Cryptosporidium and Giardia in the existing effluent discharge increases the risk of illness to downstream recreationists by 1.3 to 3.7 times. As an example, if 1000 people are exposed to the river water ten times (commonly done on a single day at the beach or water skiing), upstream of the SRCSD discharge 7 people would become ill from waterborne pathogens, however downstream of the SRCSD discharge 14 people would become ill.

The Central Valley Water Board is required to protect the beneficial uses of the Sacramento River, including recreational uses such as swimming and boating. Pathogen removal is proposed because it is not appropriate for a single controllable source of pathogens to be infecting the public contacting the Sacramento River. Tertiary Filtration will remove the increased concentrations of cryptosporidium and Giardia in downstream waters, eliminating any increased illness due to exposure to the discharged wastewater¹.

In addition to removing pathogens, Tertiary Filtration also removes solid particles and the pollutants attached to those particles, including metals, methyl mercury, some pesticides and some Constituents of Emerging Concerns (e.g. pharmaceuticals, health care products, etc.). As discussed above, all other large wastewater treatment plants in the Delta (Lodi, Manteca, Stockton and Tracy) have already installed Tertiary Filtration to remove pathogens.

- 3. The District and other parties further assert that “full ammonia removal requirements are not supported by the science: and that few, if any, scientists will state conclusively that the district’s ammonia discharges are causing harm to the Delta. Please describe the scientific and substantive basis for these requirements.**

The knowledge of the aquatic impacts by ammonia is evolving, with new scientific research being done specifically on Delta waters and Delta aquatic species. For decades, USEPA's Aquatic Ammonia Criteria document was the primary assessment for ammonia toxicity. The District's current 2000 NPDES Permit granted significant dilution to SRCSD for ammonia so that the Sacramento River downstream of SRCSD's mixing zone does comply with the USEPA Ammonia Criteria.

Over the last few years there have been numerous allegations that SRCSD ammonia

¹ It should be noted that, due to the nature of gastrointestinal illness, it would be extremely difficult to measure the actual reduction in illness that occurs from tertiary filtration. Most sewage-related illness, including cryptosporidiosis and giardiasis, cause general gastrointestinal illness symptoms several days after exposure. People contacting wastewater in the Sacramento River come from a wide geographic area, and there are many other sources of gastrointestinal illness, so it would require an extensive epidemiologic study to identify illness caused by river contact

has been harming the Delta, including being directly toxic to Delta Smelt. To address the allegations, new scientific studies were conducted by the Water Boards and by other groups, with more studies in progress. One conclusion of the new research is that Delta Smelt are very sensitive to ammonia, but no more sensitive than other fish used by USEPA in developing the Ammonia Criteria; so it was concluded that SRCSD's discharge outside of the mixing zone is not acutely toxic to Delta Smelt. Some scientists are concerned that SRCSD's ammonia may be chronically toxic to Delta Smelt, but there is currently no definitive test for chronic toxicity to Delta Smelt.

Other research, however, shows that levels of ammonia in the Delta caused by SRCSD's discharge are harming the Delta food chain. Ammonia from SRCSD is stopping Diatom growth in Suisun Bay when there is not sufficient dilution to lower the ammonia concentration in the Bay. Diatoms may also be impacted in the freshwater parts of the Delta, although there is less scientific consensus on this. Recent research shows that ammonia in the Sacramento River is toxic to invertebrates for at least 30 miles downstream of the discharge. Diatoms and invertebrates are part of the food supply for larval fish and the rest of the ecosystem. Without an adequate food supply, fish populations decline.

In response to the proposed Permit, the Central Valley Board has received comments from the lead scientist with the Delta Stewardship Council, the California Department of Fish and Game, National Marine Fisheries Service and the National Fish and Wildlife Service, supporting the proposed Permit conditions and the science behind those conditions. Almost all the ammonia in the Delta is from the SRCSD discharge because *all other large wastewater treatment plants in the Delta already remove ammonia from their discharges*

- 4. The District and other parties state that the costs of the permit, when implemented, will exceed \$2 billion and that local sewer rates could triple. Has the board reviewed these cost assumptions and come to any conclusions regarding their veracity? To the extent they are accurate, are there ways for the board or the district to mitigate the costs of implementation in a manner that would not sacrifice environmental or public health benefits?**

The proposed Permit does not require the implementation of specific treatment technologies, but instead establishes discharge limits and allows the discharger to decide on the best treatment technology or compliance options to meet those requirements. The District will not know the final costs of plant upgrades until the NPDES Permit is adopted and engineering studies, probably including pilot scale treatment plant testing, are concluded. The preliminary District's cost estimates included microfiltration, which is a more expensive alternative than tertiary filtration or membrane reactors used by other treatment facilities. The District also includes Ultraviolet light disinfection in the cost estimates, which is not required by the proposed permit. In fact, the proposed permit grants dilution in the Sacramento River for trihalomethanes (chlorination byproducts) so that SRCSD can continue to use the existing chlorination system. Although the District can choose to install these more costly technologies, they are not required by the proposed permit.

A USEPA engineering contractor reviewed the District's cost estimates for the Central Valley Water Board and concluded that some modifications to the treatment system evaluated by SRCSD "could potentially reduce the cost by as much as \$859 million and achieve the same effluent quality goals." Another engineering consultant hired by the State Water Contractors provided a cost estimate about one-half of the District's estimate.

Central Valley Water Board staff has reviewed the relative per capita costs of upgrades by other communities compared to SRCSD's cost estimate. Such cost comparisons are not exact because not all upgrade projects are equivalent, but the comparison showed that SRCSD's estimate was in the mid-range of per capita costs, and that these other communities that have completed the plant upgrades and are operating the upgraded systems, without irreparable economic harm. Even if the \$2 billion costs projected by SRCSD are correct, the increased sewage treatment rate to \$60 per month for each household is not out of line for sewer bills. Many communities discharging to surface waters pay this amount or substantially more for sewer service. For example, households in the Folsom Lake Service Area pay approximately \$100 per month for sewage treatment and households in the North Auburn Service Area pay \$67 per month for sewage treatment. Residents in Cascade Shores, a remote community in Nevada County that serves about 84 households, pay \$166.25 per month to cover the costs of their NPDES discharge that is treated through a newly constructed advanced treatment facility to meet requirements similar to those proposed for SRCSD.

On the other hand, larger communities in the Sacramento/Delta area that have already upgraded their treatment facilities to advanced treatment also similar to that in the proposed NPDES Permit have sewer fees substantially less than the monthly fees projected by SRCSD, including Stockton (\$22.75/month), Roseville (\$27.90/month), Tracy (\$31.00/month), and Lodi (\$38.84/month).

- 5. The district and other parties state that the board's proposed risk threshold in the SRCSD permit to protect REC-1 beneficial uses is 8 times more restrictive than the existing USEPA pathogens risk standard for recreational exposures. Please explain why this risk level was used.**

The proposed permit actually does not use any specific health risk level in setting pathogen removal requirements. As discussed under question 1, above, there is a measurable increase in the concentration of pathogens in the river caused by the SRCSD discharge, with an associated increased risk of illness to people contact the river water downstream of the discharge. The permit does not require reduction of pathogens to meet a specified level of risk. The permit requires removal of pathogens from the effluent so no one is getting sick because of the SRCSD discharge.

There are no state or federal regulatory standards on the number of people who can be made sick by a discharge of sewage to a river. The California Department of Public Health (CDPH) recommended a risk level of no more than one illness per 10,000 recreational contacts with the river. SRCSD recommends that the USEPA Beach Standard of 8 illnesses for 1000 recreational contacts (that is, almost 1 in 100 people

contacting the water will get ill). In their 15 June 2010 letter, CDPH explains their reasons for not applying the USEPA Beach Criteria to the SRCSD discharge.

- a. "The Criteria are based on risks posed by ambient recreational waters, where the pathogens detected are from human and animal sources. In the case under consideration, the discharge appears to be contributing at least 30 percent of the pathogens detected in the receiving waters. The human origin of these pathogens renders them more hazardous to swimmers.
- b. The discharge is a controllable source, and the risk it poses may be abated by additional treatment. This is not true of waters impacted by non-point sources.
- c. The Criteria represent a trade-off between the public's desire to swim in natural waters and the minimum level of risk that could reasonably be achieved in 1986. CDPH questions whether this represents a level of risk that is currently "acceptable" to the public.
- d. CDPH considers a 1 in 10,000 risk of infection to be an acceptable risk from exposure to treated sewage effluents, and used this as a basis for its Recycled Water Regulations. In a site-specific study, Dr. Gerba estimates that the average risk of infection from a single swimming exposure to the effluent is approximately one order of magnitude higher than this threshold. The estimated risk of infection from 10 such exposures is two orders of magnitude higher."

Central Valley Water Board staff does not consider that nearly one illness in 100 exposures is an appropriate level of public health risk from a single, controllable source of treated wastewater. If SRCSD were allowed to increase the risk of illness to 8 illnesses per 1000 exposures, then pathogens from all the other sources would increase the overall level of illness beyond the USEPA Criteria, and the beneficial use of the Sacramento River for recreation will not be protected.

The Delta has major water quality and ecologic problems which have State-wide water supply and economic impacts. While the SRCSD discharge is not the cause of all these problems, the SRCSD discharge does contribute to the problems. Under USEPA regulations, the Water Board must adopt an NPDES Permit that will eliminate adverse impacts on beneficial uses. That is what the proposed NPDES Permit for the SRCSD discharge will do.

If you have any further questions on this matter, please feel free to contact me at (916) 464-4638 or Kenneth Landau, at (916) 464-4839

Sincerely,



Pamela C. Creedon
Executive Officer

cc: (See next page)

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