

INFORMATION SHEET

R5-2009-XXXX
CITY OF FRESNO
SURFACE WATER TREATMENT PLANT
FRESNO COUNTY

Background

The City of Fresno (hereafter Discharger) submitted a Report of Waste Discharge (RWD), dated 26 September 2003, for a new Surface Water Treatment Plant (SWTP). Additional information to complete the RWD was received on 12 December 2003, and 20 May 2004.

The SWTP is owned and operated by the City of Fresno to provide potable water for domestic use. Construction of the SWTP was completed in 2004. The SWTP is currently designed to treat up to 30 million gallons of water per day (mgd). In the future the plant may be expanded to process and treat up to 60 mgd. The SWTP operates for approximately 11 months out of the year. For one month out of the year the plant is inactive while the Enterprise Canal is shut down for maintenance and cleaning.

Treatment Process

Intake pumps deliver raw surface water from the Enterprise Canal to the pretreatment Actiflo® clarification process. The Actiflo® clarification process uses microsand and a food grade polymer for ballasted flocculation to improve clarification and reduces the frequency of filter backwashes. Polyaluminum sulfate (alum) is added to condition the raw water prior to clarification. After clarification the water enters the ozonation chamber, where ozone is added for disinfection. Once through the clarification and disinfection processes, the clarified water is filtered through a series of granulated activated carbon filters to remove further impurities. Following treatment and disinfection the treated water is stored in an underground reservoir tank prior to distribution. Sodium hypochlorate is added to the treated water to provide sufficient chlorine residual for the distribution system, and carbon dioxide is added as needed for pH adjustment.

Solids from the clarifier and filter backwash water are discharged into four onsite settling/evaporation ponds. The settling/evaporation ponds are operated one at a time and rotated through operation cycles. Once the capacity of a pond is exhausted the discharge is stopped and the collected solids are allowed to dry. During the drying mode the solids remain in the offline pond and allowed to settle out. Water in the pond is decanted and returned to the headworks of the treatment system.

Solids in the ponds were expected to settle out and create an impervious layer to prevent dissolved metals and other waste constituents in the discharge from leaching out into groundwater. The Discharger proposed to leave four to six inches of the settled solids on the bottom of the ponds in order to retain this impervious layer. In addition the Discharger installed lysimeters beneath two of the settling ponds to detect any undesirable leachate, and established a trigger condition to require lining the ponds.

The conditions that would require lining the ponds have not occurred, and the lysimeters have remained dry following the first two monitoring events. However, the functionality of the lysimeters is questionable.

Monitoring of the raw water, treated water, and sludge does not indicate that the discharge is a designated waste as defined by CCR, Title 27, section 20005. However because of concerns with the lysimeters, the Discharger has elected to line two of the settling/evaporation ponds to address possible issues of migration and potential impacts to groundwater. The plans call for lining the ponds with a 60 mil HDPE liner covered with a geotextile fabric and a minimum of two feet of sand, to protect the liner when the sludge is being removed. Thereafter, as resources allow, the remaining two ponds will also be lined to preclude any potential groundwater degradation in whatever capacity the ponds will be utilized (i.e., wastewater storage or supplemental raw water storage during times of emergency plant shutdown).

Groundwater Conditions

Regional groundwater in the area is encountered at about 130 feet below ground surface (bgs) and flows to the west according to information in Lines of Equal Elevation of Water in Wells in Unconfined Aquifer, published by Department of Water Resources in Spring 2006.

There are no monitoring wells onsite. The RWD provides groundwater quality data for two municipal supply wells (Wells 185 and 186) within one mile of the site. Both wells are constructed to about 400 feet below grade and screened from 150 and 210 feet, respectively. Background water quality from the two supply wells is fair with an EC of 200 to 360 $\mu\text{mhos/cm}$, TDS from 220 to 300 mg/L, nitrate (as NO_3) from 20 to 50 mg/L, and aluminum and iron below detection limits. Nitrate in groundwater exceeds the Maximum Contaminant Level (MCL) for nitrates of 45 mg/L, likely the result of agricultural activities in and around the area. Since the raw water is low in nitrates (e.g. < 1 mg/L), and nitrogen is not added as part of the treatment process the discharge will not contribute to the presence of nitrates in groundwater.

Basin Plan, Beneficial Uses, and Regulatory Considerations

The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition, revised January 2004* (hereafter Basin Plan) designates beneficial uses, establishes narrative and numerical water quality objectives, contains implementation plans and policies for protecting all waters of the Basin, and incorporates, by reference, plans and policies of the State Water Resources Control Board (State Water Board). Pursuant to section 13263(a) of the California Water Code (CWC), these requirements implement the Basin Plan.

The Basin Plan indicates the greatest long-term problem facing the entire Tulare Lake Basin is increasing salinity in groundwater, a process accelerated by man's activities and particularly affected by intensive irrigated agriculture. The Basin Plan recognizes that degradation is unavoidable until there is a long-term solution to the salt imbalance. The Regional Water Board encourages proactive management of waste streams by dischargers to control addition of salt through use, and has established an incremental EC limitation of 500 $\mu\text{mhos/cm}$ over source water or a maximum of 1,000 $\mu\text{mhos/cm}$, as the measure of the permissible addition of

salt constituents through use. Discharges to areas that may recharge good quality groundwater shall not exceed an EC of 1,000 $\mu\text{mhos/cm}$, a chloride content of 175 mg/L, or a boron content of 1.0 mg/L.

Antidegradation

The antidegradation directives of State Water Board Resolution No. 68-16, "Statement of Policy With Respect to Maintaining High Quality Waters in California," or "Antidegradation Policy" require that waters of the State that are better in quality than established water quality objectives be maintained "consistent with the maximum benefit to the people of the State." Policy and procedures for complying with this directive are set forth in the Basin Plan.

Some degradation of groundwater by typical waste constituents released with discharge from a water treatment plant after effective source control, and treatment is consistent with maximum benefit to the people of the State. The SWTP provides a vital resource for the community and reduces its dependence on groundwater. The technology, energy, and waste management advantages of a municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous domestic water wells, and the impact on water resources will be substantially less. Economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, and therefore sufficient reason to accommodate growth and groundwater degradation provided terms of the Basin Plan are met.

The Fresno SWTP provides treatment and control of the discharge that incorporates reinforced concrete treatment structures and will include the installation of liners in the settlement/evaporation ponds to prevent percolation of waste constituents to underlying groundwater. Based on the superior chemical character of the raw and treated water, the nature of the treatment process, and the fact that all treatment and waste management units will consist of reinforced concrete or be lined with a low permeability liner to prevent percolation to groundwater, the discharge poses little threat to groundwater quality. At this time, there is no reason to believe that additional BPTC measures are needed to achieve water quality objectives consistent with the maximum benefit to the people of the State.

The proposed Order establishes groundwater limits that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan. Although this Order does not require groundwater monitoring, it does include requirements for continued monitoring of the raw water, supernatant return, and liner inspections. If monitoring results reveal a previously undetected threat to water quality, or indicate a change in waste character such that the discharge poses a threat to water quality, the Executive Officer may require groundwater monitoring and/or the Central Valley Water Board may reopen this Order to reconsider groundwater limitations and other requirements to comply with Resolution No. 68-16.

Title 27

Title 27, CCR, section 20005 et seq. (Title 27) contains regulations to address certain discharges to land. Title 27 establishes a waste classification system, specifies siting and construction standards for full containment of classified waste, requires extensive monitoring of groundwater and the unsaturated zone for any indication of failure of containment, and specifies closure and post-closure maintenance requirements. Generally, no degradation of groundwater quality by any waste constituent in a classified waste is acceptable under Title 27 regulations.

Title 27 section 20090(b) exempts discharges of designated waste to land from Title 27 containment standards provided the Central Valley Water Board has issued waste discharge requirements or waived such issuance; the discharge is in compliance with the Basin Plan; and the waste need not be managed according to Title 22, CCR, Division 4.5, Chapter 11, as a hazardous waste.

The discharge consists of incidental discharges from treatment and storage facilities associated with a water treatment plant, is regulated by waste discharge requirements consistent with applicable water quality objectives, and does not need to be managed as a designated or hazardous waste.

CEQA

On 4 October 2001, the City of Fresno adopted a Mitigated Negative Declaration for the construction and operation of a Surface Water Treatment Plant to provide potable drinking water for the City of Fresno. A Notice of Determination was filed on 15 January 2002.

The Mitigated Negative Declaration determined that the project would have a less than significant impact on water quality. The Central Valley Water Board reviewed and concurred with the conclusions in the Mitigated Negative Declaration that the project would have a less than significant impact on water quality. The Mitigated Negative Declaration contains the following mitigation measures to mitigate any adverse impacts to water quality:

- a. Site drainage will be directed away from the Enterprise Canal to keep storm water out of the surface water distribution system;
- b. All chemicals utilized in the treatment process will be stored in an H-7 rated containment structure with double walled containment and special spill containment sumps designed to hold and contain liquids. Liquid collected in the sump will be characterized and discharged to the sewer system or disposed of at an appropriate disposal facility; and
- c. Construction of a vadose zone monitoring system (lysimeters) beneath two of the settling/evaporation ponds to detect any undesirable leachate from the ponds, with an established trigger condition to require lining the ponds.

Proposed Order Terms and Conditions

Discharge Prohibitions, Effluent Limitations, Discharge Specifications, and Provisions

The proposed Order prohibits discharge to surface waters and water drainage courses.

Because the waste contains little organic matter, the standard specification requiring that dissolved oxygen concentration in the ponds be maintained above 1.0 mg/L oxygen is not necessary to prevent nuisance conditions.

The proposed Order would prescribe groundwater limitations that implement water quality objectives for groundwater from the Basin Plan. The limitations require that the discharge not cause or contribute to exceedances of these objectives or natural background water quality, whichever is greater.

To address possible issues of migration of waste constituents to groundwater the Discharger has elected to install 60-mil HDPE liners in two of the settling/evaporation ponds. This Order includes provisions requiring the Discharger to complete installation of the proposed liners and submit a Post-Construction Report and Operations and Maintenance Plan. In addition, the Discharger is required to submit certification that the lined ponds shall have sufficient capacity to handle discharges from the SWTP up to the current treatment capacity of 30 mgd.

Monitoring Requirements

Section 13267 of the CWC authorizes the Central Valley Water Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the state. In recent years there has been increased emphasis on obtaining all necessary information, assuring the information is timely as well as representative and accurate, and thereby improving accountability of any discharger for meeting the conditions of discharge. Section 13268 of the CWC authorizes assessment of civil administrative liability where appropriate.

The proposed Order includes requirements for monitoring for flow and field parameters of raw water and supernatant return water, as well as for constituents of concern including dissolved metals and trihalomethanes in the supernatant return water. In addition, the proposed Order requires the Discharger to keep accurate records of sludge disposal activities and liner inspections.

Reopener

The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. It may be appropriate to reopen the Order if applicable laws and regulations change.