INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS ORDER R5-2012-XXXX
EAST BAY MUNICIPAL UTILITY DISTRICT
CAMANCHE NORTH SHORE RECREATION AREA
WATER TREATMENT PLANT LAND APPLICATION
AMADOR COUNTY

Background

The East Bay Municipal Utility District (referred to as "Discharger") installed a new irrigation system at the Blue Oaks Playground and an adjacent wooded campground area (the land application areas, or "LAAs") to discharge filter backwash water generated from Camanche North Shore Water Treatment Plant ("WTP"). The LAAs are located in the Camanche North Shore Recreation Area, approximately 500 feet from the Camanche Reservoir shoreline based on the nominal reservoir level, as shown on Attachment A.

Groundwater from supply wells is treated in the WTP prior to distribution as a public water supply. The WTP provides treatment by pre-chlorination, filtration and disinfection. Calcium hypochlorite is added for pre-chlorination and for removing iron and manganese from water supply by precipitation. A site plan and a simplified process schematic are presented in Attachment B, and C, respectively.

During April through October from 2009 through 2011, the WTP produced approximate monthly averages of 75,000 gallons per day ("gpd") of treated water and 8,600 gpd of filter backwash water. The filter backwash water is discharged to two clay-lined ponds (ponds 1 and 2) for evaporation. During the wet season, the overflow from the ponds flows into an unnamed creek and then into Camanche Reservoir. This surface water discharge is regulated under the National Pollutant Discharge Elimination System ("NPDES") General Order 5-2008-0081-018 *Dewatering and Other Low Threat Discharge to Surface Water* (the "General Oder").

During the summer, the unnamed creek may occasionally have standing or slow-flowing filter backwash water that could cause mosquito breeding. To reduce the public concerns regarding the mosquito issues, the Discharger installed an irrigation system that redirects the discharge from the storage ponds to irrigate the LAAs from April through October.

This Order regulates the filter backwash water discharge on the LAAs. The winter discharge into the unnamed creek and Camanche Reservoir remains under the regulation of the General Order.

Backwash Water Reuse

During April through October, the filter backwash water is directly conveyed to the irrigation system at the two LAAs instead of the storage ponds. The irrigation system consists of four 2,500-gallon polyethylene tanks, two 85-gallon pressure tanks, and spray and drip control systems. All six tanks are in series, allowing solids settling. The filter backwash water is applied to approximately one acre of Blue Oaks Playground via a spray system and approximately three acres of adjacent campground area via a drip system. To prevent irrigation runoff from the playground entering the reservoir, an earthen berm was installed

along a portion of the playground, as shown on Attachment B. The drip system will not generate tailwater, so that area is not bermed. The irrigation system process schematic is shown on Attachment C.

The Discharger started to operate the filter backwash water irrigation system in June 2011. The average irrigation rate is approximately 6,400 gpd during the summer months in 2011. The Discharger provided two sets of data for the filter backwash water that is discharged to the LAAs. The filter backwash water has average concentrations of 506 µg/L for total iron and 1,550 µg/L for total manganese. The dissolved iron and manganese concentrations in the filter backwash water are non-detected and 1.15 µg/L, respectively, which are much lower than the secondary MCL of 300 µg/L for iron and the primary MCL of 50 µg/L for manganese. This indicates that the dominant forms of iron and manganese in the filter backwash water are in solid form, which is unlikely to migrate through the soil and impact groundwater.

The December 2011 RWD Amendment indicates that the monthly average agronomic irrigation rate for the LAAs is approximately 7,800 gpd from April through October, which is approximately 91 percent of the monthly average backwash water production of 8,600 gpd during the same period; the monthly maximum agronomic irrigation rate is approximately 10,000 gpd. The excess backwash water is diverted to the two storage ponds for percolation and evaporation. The Discharger stated that no overflow from the storage ponds was discharged into the unnamed creek during the summer months in 2011 and that mosquito issues have been resolved.

Groundwater Conditions

There are no groundwater monitoring wells at the LAA discharge site. However, there are two upgradient monitoring wells MW-2 and MW-3 installed at the Camanche North Shore Wastewater Treatment Plant, which are located 2,500 feet north of the LAAs, and there is one downgradient well at the marina approximately 4,000 feet located laterally and east of the site on the shoreline of the Camanche Reservoir, as shown on Attachment B.

Groundwater elevation data for the three wells indicate that shallow groundwater flows south below the LAAs towards the reservoir. Groundwater at the LAAs is estimated to be as deep as 25 feet below ground surface based on the site topography and known shallow groundwater elevations.

Based on the quarterly sampling of background monitoring wells MW-2 and MW-3, the groundwater iron concentrations (7,052 µg/L and 4,730 µg/L in MW-2 and MW-3, respectively) are much greater than the secondary MCL and the total iron concentration in the groundwater supply (41.2 µg/L in iron). Additionally, the total manganese concentrations (329 µg/L and 78 µg/L) in the two wells are greater than the primary MCL. Compared to shallow groundwater iron and manganese concentrations, the filter backwash water has much lower average dissolved concentrations (non-detect for iron and 1.15 µg/L in manganese) and will not degrade the groundwater. Therefore, groundwater monitoring is not necessary.

Basin Plan, Beneficial Uses, and Regulatory Considerations

Surface water drainage is to Camanche Reservoir. The *Water Quality Control Plan for the Sacramento River and San Joaquin River Basins, Fourth Edition*, (hereafter "Basin Plan") designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the basin, and incorporates by reference plans and policies adopted by the State Board. Pursuant to Water Code section 13263(a), waste discharge requirements must implement the Basin Plan.

Antidegradation

State Water Resources Control Board Resolution 68-16 ("Policy with Respect to Maintaining High Quality Waters of the State") (hereafter "Resolution 68-16") prohibits degradation of groundwater unless it has been shown that:

1. The degradation is limited and will provide social and economical benefit to the people of the State;
2. The degradation will not unreasonably affect present and anticipated future beneficial uses;
3. The degradation is not expected to result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives; and
4. The discharger employs BPTC to minimize degradation.

In August 2010, the Discharger submitted an Antidegradation Analysis Report. The report states that the backwash water reuse will increase public beneficial uses, visual qualities and recreation values of the LAAs, reduce the potential for the mosquito issues in the creek during the warm months, and eliminate the overflow into the unnamed creek and Camanche Reservoir in summer. The report also provides a manganese loading rate based on a sample collected directly from the filters in March 2010. However, the calculation using a total manganese concentration instead of a dissolved concentration overstates the actual loading to the LAAs because the solids in the filter backwash water are settled in the irrigation system settling tanks. In addition, an underestimated irrigation rate, which is less than half of the updated average rate, was used in the calculation.

Because most of the manganese in the waste is insoluble, the manganese loading rate was recalculated based on the average dissolved manganese concentration of 1.15 µg/L. The calculation result shows that approximately 1.6×10^{-2} pounds of dissolved manganese will be applied to the LAAs each year. The RWD includes plant absorption rates for manganese, which are 0.5 to 2 pounds per acre for typical soil and 2 to 8 pounds per acre for severely deficient soil each year. Thus the irrigation will not significantly impact the soil. In addition, aeration and/or mixing (e.g. via spray irrigation) would result in further precipitation of iron and manganese by oxidation; thereby minimizing manganese and iron migration into the groundwater.

The limited groundwater degradation that may occur after effective source control and treatment is consistent with maximum benefit to the people of California, provided that the degradation does not impair any existing beneficial uses or cause any violations of applicable water quality objectives. Municipal water service is made possible by the operation of the WTP, and municipal water service presents advantages over reliance on numerous domestic water wells. These advantages include: energy savings, higher-quality water, and greater reliability. Degradation of groundwater by waste constituents not specified in the groundwater limitations in this Order, and degradation by waste constituents that can be effectively removed by conventional treatment (e.g., total coliform bacteria) is prohibited.

Constituents of concern that have the potential to degrade groundwater include salts (primarily TDS) and nutrients, as discussed below:

a. Compared to the background groundwater TDS concentrations of 376 mg/L and 290 mg/L in MW-2 and MW-3, respectively, the TDS concentration in the backwash effluent is approximately 221 mg/L calculated using a ratio 1:0.7 of specific conductivity to TDS, indicating that the Discharger's current best practicable treatment and control practices are effective. Therefore, the discharge is not likely to degrade groundwater quality and a TDS effluent limit is not required to protect groundwater quality.

b. For nutrients such as nitrate, the potential for unreasonable degradation depends not only on the quality of the treated effluent, but the ability of the vadose zone below the land application area to provide an environment conducive to nitrification and denitrification to convert the effluent nitrogen to nitrate and the nitrate to nitrogen gas before it reaches the water table. The nitrate (as nitrogen) concentration is non-detected in the filter backwash water. Therefore, the discharge is not likely to degrade groundwater quality.

The WTP provides treatment and control of the discharge that incorporates:

a. Technology for treatment to drinking water standards;

b. Land application at agronomic rates on the four acres of land application areas; and

c. An earthen berm t at the playground and a drip irrigation system at the other LAA to prevent runoff to surface waters.

At this time, there is no reason to believe that additional BPTC measures are needed to achieve the highest water quality consistent with the maximum benefit to the people of the State. The discharge poses little threat to groundwater quality based on the following:

a. Character of the raw water treated at the WTP;

b. Nature of the treatment processes;

c. Character of the filter backwash water; and

d. Background groundwater quality.

Although this Order does not require groundwater monitoring, it does include requirements for monitoring the raw water, supernatant discharge, and land application areas. If the results of monitoring reveal a previously undetected threat to water quality or indicate a change in waste character such that the discharge will pose a threat to water quality, the Executive Officer may require groundwater monitoring and/or the Central Valley Water Board may reopen this Order to consider additional groundwater limitations and other requirements.

Title 27 Exemption

The discharge of wastewater to land authorized herein is exempt from the requirements of California Code of Regulations, title 27 ("Title 27"), section 20005 et seq. pursuant to Title 27, section 20090(b), because:

a. The Central Valley Water Board is issuing waste discharge requirements;

b. The discharge complies with the Basin Plan; and

c. The wastewater does not need to be managed according to California Code of Regulations, title 22, section 66261.1 et seq., as a hazardous waste.

State regulations that prescribe procedures for detecting and characterizing the impact of waste constituents from waste management units on groundwater are found in Title 27. While the WTP is exempt from Title 27, the data analysis methods of Title 27 may be appropriate for determining whether the discharge complies with the terms for protection of groundwater specified in this Order.

Discharge Prohibitions, Specifications and Provisions

The discharge to the land application areas shall not exceed a monthly average of 10,000 gallons per day. The land application is allowed between 1 April and 30 October only.

Proposed filter backwash water limits are based the primary and secondary MCLs.

The Provisions require submittal of a *Solids Management Plan*.

The Monitoring and Reporting Program is designed to verify compliance with the filter backwash water limitations and operational requirements of the WDRs.