CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER R5-2012-0023

WASTE DISCHARGE REQUIREMENTS
FOR
EAST BAY MUNICIPAL UTILITY DISTRICT
CAMANCHE NORTH SHORE RECREATION AREA
WATER TREATMENT PLANT LAND APPLICATION
AMADOR COUNTY

The California Regional Water Quality Control Board, Central Valley Region ("Central Valley Water Board" or "Board"), finds that:

1. The East Bay Municipal Utility District (referred to as "Discharger") submitted a Report of Waste Discharge ("RWD") dated 24 November 2009, to apply for Waste Discharge Requirements ("WDRs") for the discharge of filter backwash water generated from Camanche North Shore Water Treatment Plant ("WTP") to irrigate the Blue Oaks Playground and an adjacent wooded campground area (the land application areas, or "LAAs"). Additional information was received in October, November, and December 2011.

2. The Discharger owns the WTP and the LAAs. The LAAs are in the Camanche North Shore Recreation Area, which is located at 2000 Camanche Road, Ione, (Assessor's Parcel No. 003-046-004) in Section 35, T5N, R9E, (MDB&M), as shown on Attachment A, which is attached hereto and made part of the Order by reference.

3. The filter backwash water generated from the WTP is discharged to two storage ponds 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 R5-2008-0081-018 *Dewatering and Other Low Threat Discharge to Surface Water* (the "General Oder").

4. 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.

5. 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.

Water Treatment Plant and Discharge

6. The WTP is located approximately 1,000 feet inland from the Camanche Reservoir shoreline. 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. A site plan is presented as Attachment B, which is attached hereto and made part of the Order by reference.

7. In the past, raw water has been blended from groundwater supply wells No. 2 and No. 3 as shown on Attachment B. Well No. 2 has been out of service since 2007 due to low water levels and poor water quality. Since then, well No. 3 has provided 100 percent of the raw water supply. Well No. 3 has a depth of 228 feet below the ground surface ("bgs") and the static depth to water ranges from 91.5 to 195 feet bgs.

8. The first step of the treatment process is pre-chlorination, which is performed by adding calcium hypochlorite to oxidize the iron, manganese and hydrogen sulfide for settling. The water is then filtered by four pyrolusite (manganese dioxide) filters. Before the potable water is conveyed to the two distribution storage tanks (150,000 and 180,000 gallon capacity), calcium hypochlorite is injected as needed for disinfection. The treated water contains low levels of chlorine residual from 0.75 to 1.0 mg/L. Attachment C, which is attached hereto and made part of the Order by reference, presents a simplified process schematic.

9. The treatment system is equipped to add low doses of potassium permanganate before filtration to assist with iron and manganese precipitation and high doses when needed to regenerate the pyrolusite. However, it has not yet been necessary to utilize the potassium permanganate.

10. The filters are typically backwashed with the treated water every six hours of run time. The backwash takes approximately six to eight minutes per filter at 190 to 220 gallons per minute ("gpm"). The backwash water combined with the treated water flowing through the instrument analyzers (0.5 to 1.5 gpm) is directed to the two clay-lined ponds (Ponds 1 and 2) operated in series for settling and evaporation. The effluent from the Pond 2 flows into the unnamed creek and then into Camanche Reservoir. This discharge is regulated under the General Order.

11. 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 average includes the treated water flowing through the instrument analyzers.

12. The RWD provides the following characterization data for the groundwater supply and treated water.

		Result		Maximum
Constituent [1]	Units	Well No.3 (3/14/07)	Treated Water (4/11/07)	Contaminant Level (MCL)
Antimony	µg/L	28.6	--	6 [2]
Arsenic	µg/L	26.4	--	10 [2]
Barium	µg/L	188	131	1,000 [2]
Beryllium	µg/L	0.55	0.624	4 [2]
Bromide	µg/L	46	0.01	NA
Cadmium	µg/L	2.2	--	5 [2]
Chloride	mg/L	4.9	8.9	250 [3]
Chromium	µg/L	14.3	--	50 [2]

Constituent [1]	Units	Result: Well No.3 (3/14/07)	Result: Treated Water (4/11/07)	Maximum Contaminant Level (MCL)
Copper	µg/L	43.3	5.2	1,300 [2]
Hardness	mg/L	NA	110	NA
Total Iron	µg/L	41.2	11	300 [3]
Lead	µg/L	13.2	--	15 [2]
Total Manganese	µg/L	305	0.832	50 [3]
Mercury	µg/L	0.02	--	2 [2]
Nickel	µg/L	4.4	--	100 [2]
Nitrate as Nitrogen	µg/L	8.5	9	10 [2]
Nitrite as Nitrogen	µg/L	3.5	3.5	NA
Orthophosphate as P	mg/L	0.11	--	NA
Selenium	µg/L	24.2	--	50 [2]
Settleable Solids	mL/L	0.1	--	NA
Silver	µg/L	0.086	0.41	100 [3]
Specific Conductivity	umhos/cm	NA	344	900 [3]
Sodium	mg/L	NA	24	NA
Sulfate	mg/L	18	19	250 [3]
Thallium	µg/L	41.8	--	NA
Tin	µg/L	9.9	--	NA
Total coliform organisms	MPN/100 mg/L	<2	--	NA
Total Dissolved Solids	mg/L	250	250	500 [3]
Total Suspended Solids	mg/L	1.2	--	NA
Zinc	µg/L	33.6	3.1	5,000 [3]

-- Not analyzed. NA - Data not available.

1. Samples were not filtered.
2. Primary MCL.
3. Secondary MCL.

Based on the above data, the treated water is very similar to the raw water except for copper, iron and manganese levels. The raw water is of high quality, except for levels of antimony, arsenic and manganese, which exceed Water Quality Objectives ("WQOs"). Concentrations of lead in the raw water are close to, but less than, the WQO.

Backwash Water Discharge

13. 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.

14. 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.

		Filter Backwash Water Result		
Constituent	Units	(6/14/2011)	(9/27/2011)	Average
Total Iron	µg/L	581	430	506
Dissolved Iron	µg/L	ND	ND	--
Total Manganese	µg/L	1,390	1,710	1,550
Dissolved Manganese	µg/L	0.952	1.34	1.15
Specific Conductivity	umhos/cm	320	310	315
Chloride	mg/L	--	18	--
Nitrate as Nitrogen	µg/L	--	ND	--
Nitrite as Nitrogen	µg/L	--	ND	--
Sodium	mg/L	--	30	--
Total Suspend Solids	mg/L	ND	24	--
pH	std	7.4	7.5	7.45

-- Not analyzed. ND – Non detect.

The filter backwash water has much lower dissolved manganese and iron concentrations than the MCLs. This indicates that the dominant forms of manganese and iron in the filter backwash water are in solid form, which is unlikely to migrate into the soil and impact groundwater.

15. 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.

16. The surface soils in the LAAs were analyzed to determine fertilizer requirements for landscaping. Analytical results are tabulated below.

Constituent	Unit	Surface Soil
pH	Std	6.5
Sodium	mg/Kg	16
Manganese	mg/Kg	19
Iron	mg/Kg	19
Nitrate as N	mg/Kg	48
Phosphorus	mg/Kg	25

The LAAs contain turf, shrubs and trees. Based on the soil nutrient levels, the estimated annual demand for fertilizers are 24 pounds of nitrogen, 44 pounds of phosphate and 6.6 pounds of sulfur. There is no need for iron and manganese supplementation.

Site-Specific Conditions

17. The distance between the LAAs and the Camanche Reservoir shoreline fluctuates with the elevation of the reservoir water level; the distance is approximately 500 feet based on the nominal reservoir level of 220 feet above mean sea level (AMSL); the distance is approximately 1,100 feet in recent drought years when the water level dropped to 190 feet AMSL. The elevation of the irrigation area is approximately 240 feet AMSL.
18. The LAAs are protected from the 100-year flood by controlling the upstream inflow at Pardee Dam and the downstream outflow at Camanche Dam.
19. The LAAs are generally level with a slope of 2 percent towards west and south. Typical subsurface soils to a maximum depth of 17 feet bgs contained sands with gravel, sand, silty sand, and sandy silts, which are related to weathered sandstone and siltstone bedrock from nearby outcrops. The estimated percolation rate is 0.2 to 0.6 inches per hour.
20. The average annual precipitation near the facility is approximately 17.5 inches and the 100-year precipitation is 31.1 inches.
21. The reference evapotranspiration rate for the area is approximately 62.8 inches per year.

Groundwater Considerations

22. There are no groundwater monitoring wells at the LAA discharge site. However, there are two upgradient background 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 playground, and there is one downgradient well at the marina approximately 4,000 feet located laterally and east of the site and on the shoreline of the Camanche Reservoir, as shown on Attachment B.
23. Groundwater elevation data for the three wells indicate that the groundwater flows south below the LAAs towards the reservoir. Wells MW-2 and MW-3 have depths to groundwater from 5 to 22 feet bgs. The groundwater at the LAAs is estimated to be as

deep as 25 feet bgs based on the site topography and known shallow groundwater elevations.

24. Background groundwater quality has been characterized by quarterly sampling of monitoring wells MW-2 and MW-3. A summary of average concentrations from October 2003 through May 2011 is presented in the table below.

Constituent	MW-2	MW-3
pH (Std.)	6.9	6.9
Nitrate as N (mg/L)	11.1	4.0
TDS (mg/L)	290	376
Chloride (mg/L)	8.3	40
Sodium (mg/L)	15.7	46
Total Iron (µg/L)	7,052	4,730
Total Manganese (µg/L)	329	78

Average iron concentrations in shallow background monitoring wells MW-2 and MW-3 are much greater than the secondary MCL and the iron concentration in the raw water supply. Additionally, the manganese concentrations in the two background monitoring wells are greater than the primary MCL. Compared to shallow groundwater iron and manganese concentrations, the filter backwash water has much lower average concentrations (non-detect for dissolved iron and 1.15 µg/L in dissolved manganese) and will not degrade the groundwater. Therefore, groundwater monitoring is not necessary.

Basin Plan, Beneficial Uses, and Regulatory Considerations

25. 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.

26. Surface water drainage is to the Camanche Reservoir. The beneficial uses of Camanche Reservoir are municipal and domestic supply; agricultural supply; water contact recreation; non-contact water recreation; warm freshwater habitat; cold freshwater habitat; warm water migration of aquatic organisms; warm and cold water spawning reproduction and/or early development; and wildlife habitat.

27. The beneficial uses of underlying groundwater are municipal and domestic water supply, agricultural supply, industrial service supply, and industrial process supply.

28. The Basin Plan establishes narrative water quality objectives for chemical constituents, tastes and odors, and toxicity in groundwater. It also sets forth a numeric objective for total coliform organisms.

29. The Basin Plan's narrative water quality objective for chemical constituents, at a minimum, requires waters designated as domestic or municipal supply to meet the MCLs

specified in Title 22. The Basin Plan recognizes that the Central Valley Water Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.

30. In summary, the narrative toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, animal, plant, or aquatic life associated with designated beneficial uses. Quantifying a narrative water quality objective requires a site-specific evaluation of those constituents that have the potential to impact water quality and beneficial uses.

31. The Basin Plan's numeric water quality objective for bacteria requires that the most probable number ("MPN") of coliform organisms over any seven-day period shall be less than 2.2 per 100 mL in MUN groundwater. The applicability of this objective to groundwater designated as MUN has been affirmed by State Water Board Order WQO-2003-0014 and by subsequent decisions of the Sacramento County Superior Court and California Court of Appeal, 3rd Appellate District.

Antidegradation Analysis

32. State Water 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:

    a. The degradation is consistent with the maximum benefit to the people of the State;

    b. The degradation will not unreasonably affect present and anticipated future beneficial uses;

    c. The degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives; and

    d. The Discharger employs best practicable treatment or control to minimize degradation.

33. 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.

34. 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.

35. 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.

36. 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 water is approximately 221 mg/L calculated using a ratio 1:0.7 of specific conductivity to TDS, indicating that the Discharger's current treatment and control practices are effective. Therefore, the discharge is not likely to degrade groundwater quality due to increased salinity, and a TDS effluent limit is not required to protect groundwater quality.

    b. For nutrients such as nitrate, the potential for degradation depends not only on the quality of the treated effluent, but also on the ability of the vadose zone below the land application area to provide an environment conducive to nitrification and denitrification, processes which convert the nitrogen in the effluent to nitrate and then 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.

37. 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 at the playground and a drip irrigation system at the other LAA to prevent the runoff to surface waters.

38. At this time, there is no reason to believe that additional 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.

39. 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.

Other Regulatory Considerations

40. Water Code section 13267(b) provides that:

> In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region … shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports

The technical reports required by this Order and the attached Monitoring and Reporting Program R5-2012-0023 are necessary to assure compliance with these waste discharge requirements. The Discharger owns and operates the facility that discharges the waste subject to this Order.

41. The LAAs and associated structures have already been installed and are currently in use. This Order places additional regulatory requirements on the continued use of these structures and facilities. These requirements are being prescribed to ensure the continued protection of the environment. This action is therefore exempt from the provisions of the California Environmental Quality Act ("CEQA"), in accordance with California Code of Regulations, title 14, section 15301, which exempts the "operation, repair, maintenance, [and] permitting … of existing public or private structures, facilities, mechanical equipment, or topographical features" from environmental review. This action may also be considered exempt because it is an action by a regulatory agency for the protection of natural resources (Cal. Code Regs., tit. 14, § 15307.) and an action by a regulatory agency for the protection of the environment (Cal. Code Regs., tit. 14, § 15308.).

42. 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.

43. 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.

44. Pursuant to Water Code section 13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.

Public Notice

45. All the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.

46. The Discharger and interested agencies and persons have been notified of the intent to prescribe waste discharge requirements for this discharge, and they have been provided an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

47. All comments pertaining to the discharge were heard and considered in a public meeting.

IT IS HEREBY ORDERED that, pursuant to Water Code sections 13263 and 13267, East Bay Municipal Utility District and its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the Water Code and regulations adopted thereunder, shall comply with the following:

[Note: Other prohibitions, conditions, definitions, and some methods of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements" dated 1 March 1991.]

A. Discharge Prohibitions:

1. Discharge of wastes to surface waters or surface water drainage courses is prohibited, except as specifically authorized by a separate NPDES permit.
2. Discharge of hazardous waste, as defined in California Code of Regulations, title 23, section 2521(a), or designated waste, as defined in Water Code section 13173, is prohibited.
3. Discharges of waste to locations other than the land application areas described in the Findings and shown on Attachment B are prohibited, unless specifically authorized by a separate NPDES permit.

B. Discharge Specifications:

1. 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.

2. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of the Groundwater Limitations.
3. Neither the treatment nor the discharge shall cause a nuisance or condition of pollution, as these terms are defined in Water Code section 13050.
4. Objectionable odors originating at this facility including the land application area shall not be perceivable beyond the limits of the water treatment plant site boundaries.
5. The Discharger shall operate all systems and equipment to optimize the quality of the discharge.

C. Land Application Area Requirements:

1. The discharge of backwash effluent shall be distributed uniformly on adequate acreage.
2. Discharge of backwash effluent, including runoff, spray, or droplets from the system, shall not occur outside the boundaries of the LAAs. Waste application using sprinklers or drip irrigation is acceptable if the discharge complies with all requirements of this Order.
3. The Discharger shall maintain the perimeter of the LAAs to prevent the irrigation runoff.
4. No pooling or ponding of irrigated water shall occur beyond 24 hours after application.
5. Discharges to LAAs shall be managed to minimize both erosion and runoff from the irrigated area.
6. The LAAs shall be managed to prevent breeding of mosquitoes. More specifically:
   a. All applied irrigation water must infiltrate completely within 24 hours.
   b. Ditches not serving as wildlife habitat should be maintained free of emergent, marginal, and floating vegetation.
   c. Low pressure pipelines, unpressurized pipelines, and ditches that are accessible to mosquitoes shall not be used to store wastewater.
7. Irrigation using backwash effluent shall not be performed within 24 hours of a predicted storm event, during a storm, within 24 hours after cessation of precipitation, or when the soils are saturated.
8. The application of supernatant to the LAAs shall comply with the following setback requirements:

Setback Definitions [1]	Minimum Irrigation Setback (feet)
Edge of land application area [2] to any watercourse	50
Edge of land application area [2] to industrial, domestic, or irrigation well	50

[1] Additional setbacks may be needed to comply with other requirements of the Order.
[2] As defined by the wetted area produced during irrigation.

D. Solids/Sludge Disposal Requirements:

1. Solids generated from the water treatment process shall be removed from sumps, tanks, etc. as needed to ensure optimal operation and adequate hydraulic capacity and disposed of at an appropriately permitted facility.
2. Any proposed change in solids use or disposal practice from a previously approved practice shall be reported to the Executive Officer at least 90 days in advance of the change.

E. Filter Backwash Water Effluent Limitations:

1. Filter backwash water discharged to the LAAs shall not exceed the following limits:

Constituent	Units	Maximum Concentration
Dissolved Antimony	µg/L	6
Dissolved Arsenic	µg/L	10
Dissolved Dissolved Iron	µg/L	300
Dissolved Lead	µg/L	15
Dissolved Manganese	µg/L	50
Total Dissolved Solids	mg/L	500

F. Groundwater Limitations:

1. Release of waste constituents from the discharge to the LAAs shall not cause groundwater quality to be degraded.

G. Provisions:

1. The following reports shall be submitted pursuant to Water Code section 13267 and shall be prepared as described in Provision G.2.
   a. By **30 June 2012**, the Discharger shall submit a *Solids Management Plan* that describes the disposal locations and methods for the solids generated from storage tanks in the irrigation system.
2. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geological sciences, shall be prepared by, or under the direction of, persons registered to practice in California pursuant to Business and Professions Code sections 6735, 7835, and 7835.1. To demonstrate compliance with Calfornia Code of Regulations, title 16, sections 415 and 3065, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

3. The Discharger shall comply with Monitoring and Reporting Program R5-2012-0023, which is a part of this Order, and any revisions thereto as ordered by the Executive Officer.
4. The Discharger shall use the best practicable treatment and control, including proper operation and maintenance, to comply with this Order.
5. The Discharger shall report to the Central Valley Water Board any toxic chemical release data reported to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to Section 313 of the Emergency Planning and Community Right to Know Act of 1986. (42 U.S.C. § 11023.)
6. The Discharger shall comply with the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements", dated 1 March 1991, which are attached hereto and by reference a part of this Order. This attachment and its individual paragraphs are commonly referenced as "Standard Provision(s)."
7. At least **90** days prior to termination or expiration of any lease, contract, or agreement involving the sites and facilities used to justify the capacity authorized herein and assure compliance with this Order, the Discharger shall notify the Central Valley Water Board in writing of the situation and of what measures have been taken or are being taken to assure full compliance with this Order.
8. The Discharger shall submit to the Central Valley Water Board on or before each compliance report due date the specified document, or if appropriate, a written report detailing compliance or noncompliance with the specific schedule date and task. If noncompliance is reported, then the Discharger shall state the reasons for noncompliance and shall provide a schedule to come into compliance.
9. The Discharger shall report promptly to the Central Valley Water Board any material change or proposed change in the character, location, or volume of the discharge.
10. In the event of any change in control or ownership of the facility or land application areas, the Discharger must notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to this office. To assume operation as Discharger under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, the name and address and telephone number of the persons responsible for contact with the Central Valley Water Board, and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the Water Code. Transfer shall be approved or disapproved by the Executive Officer.
11. A copy of this Order shall be kept at the discharge facility for reference by operating personnel. Key operating personnel at each land application property shall be familiar with its contents.

12. The Central Valley Water Board will review this Order periodically and may revise requirements when necessary.

Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:

http://www.waterboards.ca.gov/public_notices/petitions/water_quality

or will be provided upon request.

If, in the opinion of the Executive Officer, the Discharger fails to comply with the provisions of this Order, the Executive Officer may refer this matter to the Attorney General for judicial enforcement, may issue a complaint for administrative civil liability, or may take other enforcement actions. Failure to comply with this Order or with the WDRs may result in the assessment of Administrative Civil Liability of up to $10,000 per violation, per day, depending on the violation, pursuant to the Water Code, including sections 13268, 13350 and 13385. The Central Valley Water Board reserves its right to take any enforcement actions authorized by law.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 30 March 2012.

Original signed by

PAMELA C. CREEDON, Executive Officer

LF: 2/7/12

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM R5-2012-0023
FOR
EAST BAY MUNICIPAL UTILITY DISTRICT
CAMANCHE NORTH SHORE RECREATION AREA
WATER TREATMENT PLANT LAND APPLICATION
AMADOR COUNTY

This Monitoring and Reporting Program ("MRP") describes requirements for monitoring raw water, filter backwash water, and land application areas. This MRP is issued pursuant to Water Code section 13267. The Discharger shall not implement any changes to this MRP unless and until a revised MRP is issued by the Executive Officer.

Specific sampling locations shall be approved by Central Valley Regional Water Quality Control Board ("Central Valley Water Board") staff prior to implementation of sampling activities. All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each grab sample shall be recorded on the sample chain of custody form. Field test instruments (such as those used to measure pH and dissolved oxygen) may be used provided that:

1. The operator is trained in proper use and maintenance of the instruments;
2. The instruments are calibrated prior to each monitoring event;
3. The instruments are serviced and/or calibrated per the manufacturer's recommended frequency; and
4. Field calibration reports are submitted as described in the "Reporting" section of the MRP.

RAW WATER MONITORING

The Discharger shall establish permanent monitoring stations within the water treatment plant ("WTP") as needed to ensure that all samples are representative. At a minimum, the Discharger shall monitor raw water as follows:

Constituent	Units	Sample Type	Sampling Frequency	Reporting Frequency
Flow	gpd	Meter Observation	Daily	Monthly
Electrical Conductivity	µmhos/cm	Grab	Annually	Annually
Total Dissolved Solids	mg/L	Grab	Annually	Annually
pH	Standard	Grab	Annually	Annually
Dissolved Metals [1, 2]	mg/L	Grab	Annually	Annually
Standard Minerals [3]	mg/L	Grab	Annually	Annually

[1] At a minimum, the following metals shall be included: antimony, arsenic, cadmium, chromium, copper, iron, lead, magnesium, manganese, mercury, nickel, silver, thallium, and zinc.
[2] Samples shall be filtered through a 0.45-micron filter prior to preservation.
[3] Standard minerals shall include, at a minimum, the following elements/compounds: bromide, chloride, fluoride, and sodium.

FILTER BACKWASH WATER MONITORING

The filter backwash water from the second pressure tank shall be sampled and monitored for the following. Grab samples will be considered representative of the discharge. Semi-annual monitoring shall occur in the second and third calendar quarters.

Constituent	Units	Sample Type	Sampling Frequency	Reporting Frequency
Flow	gpd	Meter observation	Daily	Monthly
Dissolved Antimony	µg/L	Grab	Semi-annually [2]	Monthly
Dissolved Arsenic	µg/L	Grab	Semi-annually [2]	Monthly
Dissolved Iron	µg/L	Grab	Semi-annually [2]	Monthly
Dissolved Lead	µg/L	Grab	Semi-annually [2]	Monthly
Dissolved Manganese	µg/L	Grab	Semi-annually [2]	Monthly
Total Dissolved Solids	mg/L	Grab	Semi-annually [2]	Monthly
pH	Standard	Grab	Semi-annually [2]	Monthly
Standard Minerals [1]	mg/L	Grab	Annually	Annually

[1] Standard Minerals shall include, at a minimum, the following elements/compounds: bromide, chloride, fluoride, and sodium.

[2] Semi-annual monitoring results shall be reported in the monthly monitoring reports for the months during which sampling occurs.

LAND APPLICATION AREA MONTIORING

The Discharger shall monitor the application of filter backwash water to the land application areas. Monitoring shall be conducted **daily during the irrigation operations**. Evidence of erosion, ground saturation, tailwater runoff, and the presence of nuisance conditions shall be reported in the monthly monitoring report. If irrigation does not occur during a reporting period, the monitoring report shall so state.

SOLIDS DISPOSAL MONITORING

The Discharger shall implement the approved *Solids Management Plan* required by Provision G.1.a. The Discharger shall maintain a written log of all solids disposal activities. For each discrete quantity of solid removed from the facility, the log shall contain the following information:

1. Date;
2. Name and signature of the recorder of the entry;
3. Volume or weight of solids removed;
4. Name and address of permitted disposal site;
5. Analytical results for any solids monitoring conducted at the request of the disposal facility;

6. Transport method; and
7. Transporter.

REPORTING

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, sample type (e.g., raw water, wastewater, etc.), and reported analytical result for each sample are readily discernible. The data shall be summarized in such a manner to clearly illustrate compliance with waste discharge requirements and spatial or temporal trends, as applicable. The results of any monitoring done more frequently than required at the locations specified in the Monitoring and Reporting Program shall be reported to the Central Valley Water Board.

As required by the California Business and Professionals Code sections 6735, 7835, and 7835.1, all Groundwater Monitoring Reports shall be prepared under the direct supervision of a registered Professional Engineer or Geologist and signed by the registered professional.

A. Monthly Monitoring Reports

Monthly reports shall be submitted to the Central Valley Water Board on the **1st day of the second month following sampling** (i.e. the January Report is due by 1 March). At a minimum, the reports shall include:

1. Results of raw water, filter backwash water, land application area, and solids disposal monitoring performed during the month, including all daily, monthly and semi-annual sampling data. Semi-annual monitoring results shall be reported in the monthly monitoring reports for the months during which sampling occurs.
2. A comparison of monitoring data to the discharge specifications and an explanation of any violation of those requirements. Data shall be presented in tabular format.
3. Copies of laboratory analytical report(s).
4. A calibration log verifying calibration of all hand-held monitoring instruments and devices used to comply with the prescribed monitoring program.
5. Reports shall be submitted monthly, even if there is no discharge to land during that month.

B. Annual Monitoring Report

An Annual Monitoring Report shall be submitted to the Central Valley Water Board by **1 February** each year. The Annual Report shall include the following:

1. Volumes of raw water treated and filter backwash water applied to the LAAs during the previous year.
2. Results of the annual raw water and filter backwash water analytical testing.
3. Tabular and graphical summaries of all data collected during the year with data arranged to confirm compliance with the WDRs.
4. A comparison of filter backwash water monitoring results for the year to the Filter Backwash Water Limitations, and a detailed explanation of significant differences, if any.
5. A detailed description of any operational changes or new systems for sludge handling or dewatering.
6. A summary of solids disposal practices for the year, including tabulation of all solids disposal monitoring data.
7. A discussion of compliance and the corrective action taken, as well as any planned or proposed actions needed to bring the discharge into full compliance with the waste discharge requirements.
8. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.

A letter transmitting the self-monitoring reports shall accompany each report. The letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions General Reporting Requirements Section B.3.

The Discharger shall implement the above monitoring program as of the date of this Order.

Ordered by: Original signed by

PAMELA C. CREEDON, Executive Officer

30 March 2012
(Date)

LF: 02/07/12

INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS ORDER R5-2012-0023
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.

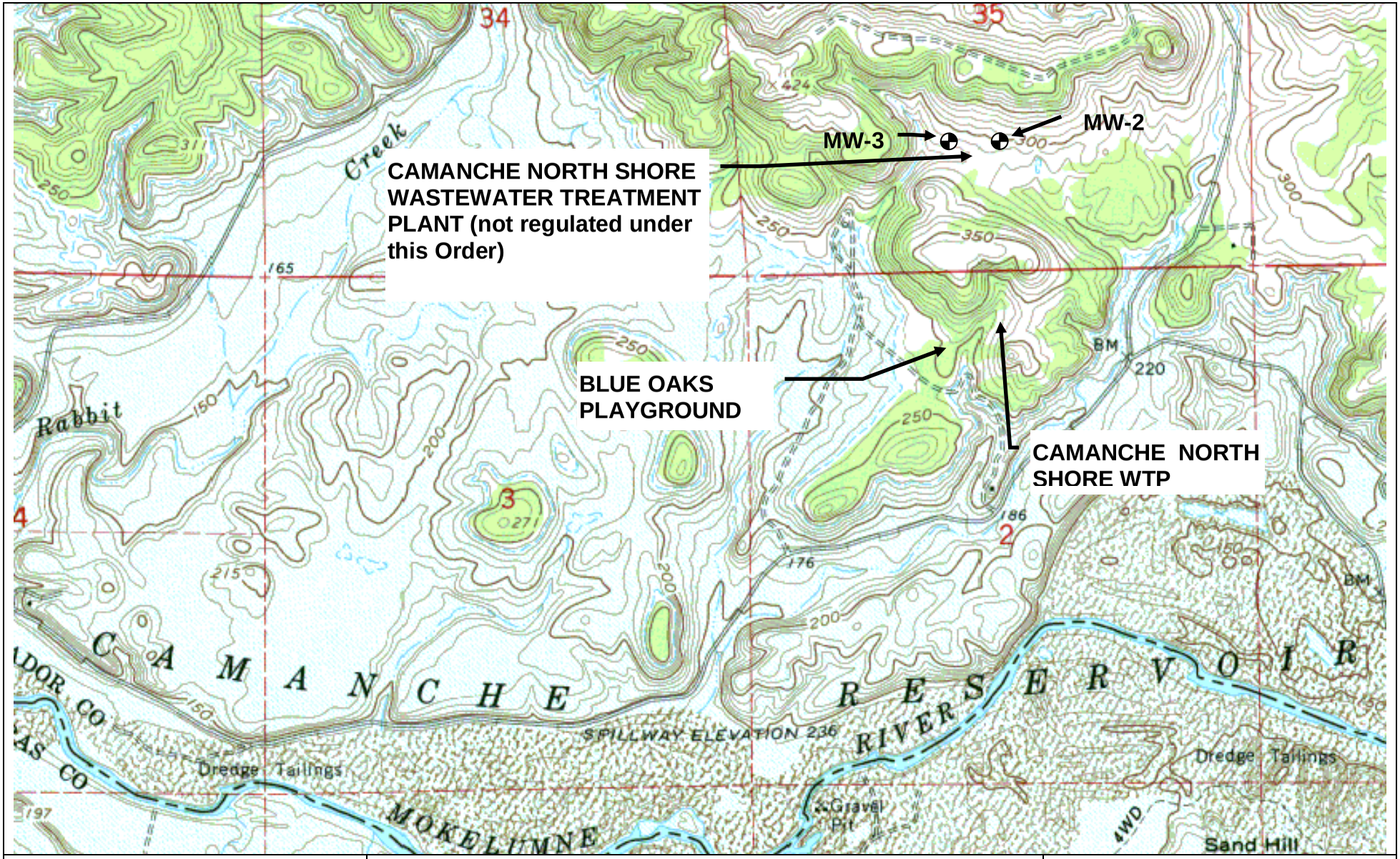
Discharge Prohibitions, Specifications and Provisions

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.

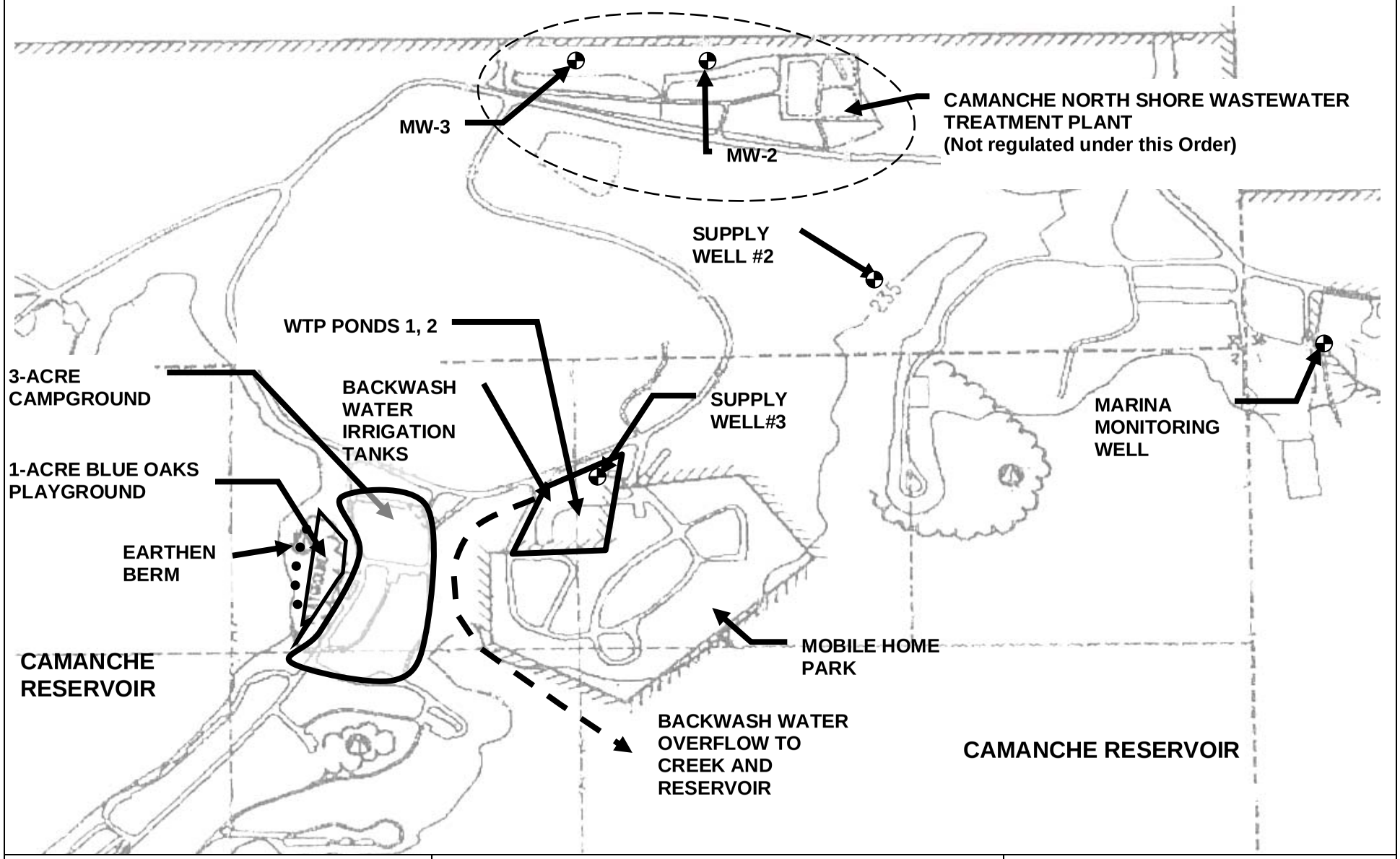
Proposed filter backwash water limits are based the primary and secondary MCLs.

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

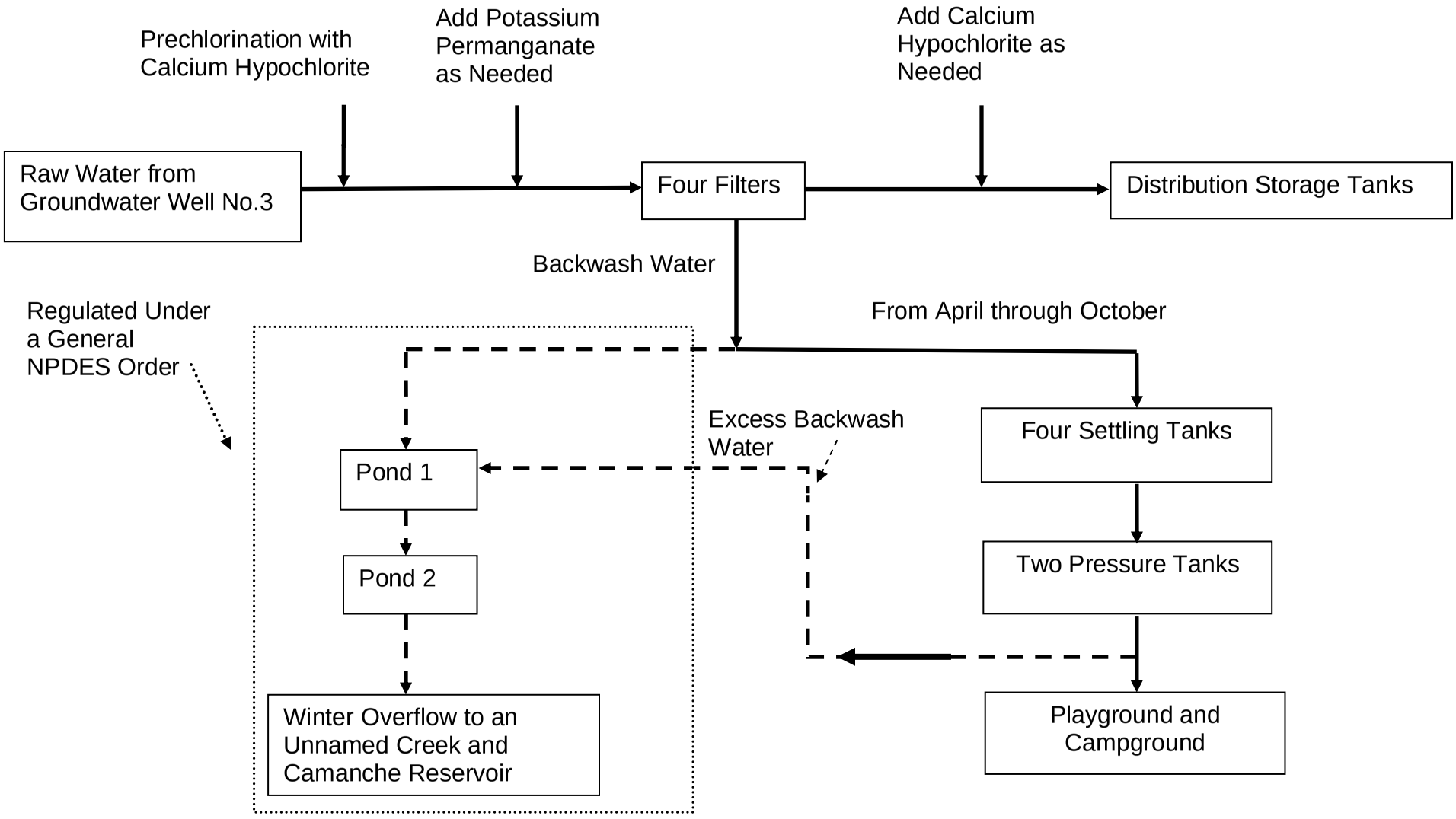
The Monitoring and Reporting Program is designed to verify compliance with the filter backwash water limitations and operational requirements of the WDRs.



Drawing Reference: USGS 7.5' Quadrangle, Iron, CA	**LOCATION MAP** Camanche North Shore Recreation Area Water Treatment Plant Land Application	Scale: 1inch=1700 feet



Drawing Reference: East Bay Municipal Utility District Report of Waste Discharge, Figure 2	**SITE PLAN** Camanche North Shore Recreation Area Water Treatment Plant Land Application	**Scale** 1 inch = 1,000 feet



Drawing Reference:
East Bay Municipal Utility District
Report of Waste Discharge, Figure 4

PROCESS SCHEMATIC
Camanche North Shore Recreation Area
Water Treatment Plant Land Application