CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2003-0153

NPDES NO. CA0082040

WASTE DISCHARGE REQUIREMENTS FOR EAST BAY MUNICIPAL UTILITY DISTRICT CAMANCHE DAM POWER HOUSE SAN JOAQUIN COUNTY

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

1. The East Bay Municipal Utility District (EBMUD), (hereafter Discharger) submitted a Report of Waste Discharge (RWD), dated 26 June 1998, and applied for a permit renewal to discharge waste under the National Pollutant Discharge Elimination System (NPDES) from the Camanche Dam Power House. Supplemental information to complete the RWD was submitted on 6 June 2003.

2. The Discharger owns and operates an industrial wastewater collection, treatment, and disposal system at the Camanche Dam Power House. Within the Power House, drainage, washdown, and leakage waters which contain lubricating oil and other petroleum products are collected in a sump, treated with a belt skimmer, then pumped to a 20,000 gallon oil separation/retention pond outside the Power House. The source of the process wastewater is water derived from the Mokelumne River at the Camanche Power House. The Power House and separation/retention pond are in Section 32, T2N, R7E, MDB&M, as shown on Attachment A, a part of this Order. Within the separation/retention pond, additional oil is removed with a rope skimmer and a series of separation baffles. Treated industrial wastewater is subsequently discharged from the pond via Outfall 001 to the Mokelumne River, a water of the United States, at the point latitude 38°, 13', 12" and longitude 121°, 01', 31" also as shown in Attachment A.

3. The Report of Waste Discharge describes the existing discharge as follows:

Monthly Average Dry Weather Flow:	0.09	million gallons per day (mgd)
Daily Peak Wet Weather Flow:	0.23	mgd
Design Flow:	0.23	mgd
Average Temperature:	63°F Summer; 54°F Winter	

Constituent	mg/L	lbs/day*
Oil and Grease	2.5	1.9

* Based upon Monthly Average Dry Weather Flow

4. The discharge of treated industrial wastewater to the Mokelumne River was previously regulated by Waste Discharge Requirements (WDR) Order No. 94-003, NPDES Permit No. CA0082040, which was adopted by the Regional Board on 28 January 1994. Under this Order, the Discharger was permitted to discharge a maximum of 0.23 million gallons per day (mgd) of treated industrial wastewater to the Mokelumne River.

5. The U.S. Environmental Protection Agency (USEPA) and the Regional Board have classified this discharge as a minor discharge.

6. The Regional Board adopted a *Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins* (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. These requirements implement the Basin Plan.

7. The Lower **Mokelumne River** flows east to west from Camanche Reservoir to the Delta. Controlled releases from Camanche Dam provided sustained flows throughout the year, ranging from 100 to 3,232 mgd. From Outfall 001, treated industrial wastewater is discharged from the Power House to the Mokelumne River downstream of the Camanche Dam. Twenty-eight miles of the Lower Mokelumne River, from Camanche Reservoir toward the Delta (Hydro Unit 531.200), have been identified as a Water Quality Limited Segment under Section 303(d) of the Clean Water Act (CWA). The list of pollutants for which the Lower Mokelumne River is impaired appears on a list (the "California 303(d) List"), which was updated in 2002 and approved by the State Water Resources Control Board (SWRCB) in February 2003. Pollutants identified on the California 303(d) List as impairing the Mokelumne River include copper and zinc. Resource extraction is identified as the primary source of these pollutants. The EBMUD discharge from the Camanche Dam Power House separation/retention pond occurs within the copper and zinc impaired region of the Mokelumne River.

8. The existing **beneficial uses** of the Mokelumne River, from Camanche Reservoir to the Delta, as identified in Table II-1 of the Basin Plan include: agricultural supply (AGR) including both irrigation and stock watering; body contact recreation, canoeing and rafting, (REC-1); and other non-body contact recreation (REC-2); warm freshwater aquatic habitat (WARM); cold freshwater aquatic habitat (COLD); migration of aquatic organisms (MIGR) both warm and cold habitats, warm and cold habitat spawning, reproduction, and/or early development (SPWN); and wildlife habitat (WILD). In addition, State Board Resolution No. 88-63, incorporated into the Basin Plan pursuant to Regional Board Resolution No. 89-056, provides that "*Where a a body of water is not currently designated as MUN* (municipal and domestic supply beneficial use) *but, in the opinion of a Regional Board, is presently or potentially suitable for MUN, the Regional Board shall include MUN in the beneficial use designation.* " Based upon ambient receiving water data collected by the Discharger, the Mokelumne River, from Camanche Reservoir to the

Delta, is suitable for MUN, therefore the MUN use is also designated as a beneficial use of this water body.

The Basin Plan on page II-1.00 states: "Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning…" and with respect to disposal of wastewaters states that "... disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses."

9. USEPA adopted the *National Toxics Rule* (NTR) on 22 December 1992, which was amended on 4 May 1995 and 9 November 1999, and the *California Toxics Rule* (CTR) on 18 May 2000, which was amended on 13 February 2001. These Rules contain water quality standards applicable to this discharge. The SWRCB adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Policy or SIP) on 2 March 2000, which contains policies and procedures for implementation of the NTR and the CTR.

10. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numeric water quality standard. Beneficial uses, together with their corresponding water quality objectives or promulgated water quality criteria, constitute water quality standards for purposes of compliance with the CWA.

In determining whether a discharge has the reasonable potential to contribute to an in-stream excursion (reasonable potential analysis), the dilution of the effluent in the receiving water may be considered where areas of dilution are defined. The available dilution may also be used to calculate protective effluent limitations by applying water quality criteria at the edge of the defined mixing zone. These calculations include receiving water pollutant concentrations that are typically based on worst-case conditions for flow and concentration.

If limited or no dilution is available, effluent limitations are set equal to the applicable water quality objectives or criteria which are applied at the point of discharge so the discharge will not cause the receiving stream to exceed water quality objectives or promulgated criteria established to protect the beneficial uses. In situations where receiving water flows are substantially greater than effluent flows, dilution may be considered in establishing effluent limitations. However, when a receiving water is impaired by a particular pollutant or stressor, limited or no pollutant assimilative capacity may be available in spite of the available dilution. In these instances, and depending upon the nature of the pollutant, effluent limitations may be set equal to or less than the applicable water quality objectives or criteria that are applied at the point of discharge such that the discharge will not cause or contribute to the receiving stream excursion above water quality objectives or promulgated criteria established to protect the beneficial uses.

11. On 10 September 2001 the Executive Officer of the Regional Board issued a letter pursuant to Section 13267 of the California Water Code (CWC) requiring all NPDES Dischargers to conduct effluent and receiving water monitoring and submit results of this monitoring in accordance with a time schedule provided in the letter. The Discharger conducted a study to determine whether levels of NTR, CTR, or other pollutants in the discharge have the reasonable potential to cause or contribute to an in-stream excursion above a numeric or narrative water quality standard, including Basin Plan numeric or narrative objectives and CTR/NTR criteria. Results of this study were submitted on 28 February 2003. Some constituents monitored in this study were not detected at concentrations equal to or greater than appropriate analytical technique Minimum Levels (ML's) specified by Appendix 4 of the SIP. Where an approved laboratory analytical method and associated ML could not, at this time, determine whether an analyte is present in the discharge above the applicable criteria, a Provision of this Order requires resampling for the constituent if new ML's are adopted by the SWRCB. Results of this study, and routine effluent and receiving water monitoring conducted by the Discharger, indicate the discharge has the reasonable potential to to cause, or contribute to an in-stream excursion above a narrative or numeric water quality standard for copper and oil and grease. As required by 40 CFR Part 122.44 (d)(1)(i)-(iii), this Order includes effluent limitations for copper and oil and grease. Additional information is needed to complete the reasonable potential analysis for mercury, and thallium. This Order includes additional monitoring requirements for these constituents, and may be reopened to include effluent limitations for these constituents if necessary.

12. Previous Order No. 94-003 included proposed effluent limitations for **copper** based upon water quality objectives established by the California Inland Surface Waters Plan. Order No. 94-003 required the Discharger to conduct a study of copper concentrations in the effluent and receiving water, and available dilution. The Discharger completed and submitted the required study, but the Order was not reopened, and limitations for copper were not established.

    The flow of treated industrial wastewater from the Camanche Power House Outfall 001 is minimal in comparison with Mokelumne River flows. At the maximum discharge flowrate of 0.23 mgd, the dilution factor of river water to discharge would range from a minimum of 435:1 to a maximum of 14,052:1. However, as noted above, the Lower Mokelumne River is identified as impaired for copper. Attachment C summarizes results of monitoring for total and dissolved copper in the receiving water and effluent since January 2000, when numerous changes were made to the Power House in an effort to reduce effluent copper concentrations. As shown in Attachment C, results of receiving water monitoring indicate several instances where the ambient hardness of the Mokelumne River is as low as 14 milligrams per Liter (mg/L), with total and dissolved concentrations of copper in the intake water, prior to use, exceeding the adjusted freshwater aquatic life water quality acute and chronic criteria for copper published in the USEPA's CTR. Based upon this ambient water column data, the receiving water lacks assimilative capacity.

The Discharger has conducted investigations and studies to identify and quantify sources of copper which may be entrained in the wastestream. Copper sources identified during these studies included erosion and electrochemical corrosion of the piping and cooling equipment, with the higher sources attributed to air compressor blowdown and seal bypass water. The highest total copper concentrations were measured in the turbine shaft seal reservoir area, at a Kinney strainer used to filter seal water, and at the heat exchangers for the two air compressors. The Discharger has worked to both eliminate sources of copper and reduce the amount of process wastewater generated by the Power House; the seal water strainers have been replaced, flow measuring rotometers have been removed, sample ports and fittings have been changed out, and, the seals of one turbine have been retrofit with non-copper wearing surfaces. New seal packages have resulted in significantly less leakage, and combined with minimized compressor cooling flows, have resulted in a significant reduction in wastewater volumes and copper contributions. The copper contribution from the Power House processes has been reduced to the point where it may be statistically indiscernible from background given existing sampling and analytical error (SAE).

However, there are remaining components of the Power House that release small quantities of additional copper to the wastestream. This incremental increase in copper, combined with a documented lack of assimilative capacity in the Lower Mokelumne River and CWA 303d Listing means that copper may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above the numeric water quality standard for copper. As shown in Attachment C, both the maximum effluent concentration (MEC) and the observed maximum ambient background concentration (B) have exceeded the adjusted criteria. Section 1.3 of the SIP requires a water quality based effluent limitation when the MEC or B exceed appropriate pollutant criterion. Therefore, a water quality based effluent limitation for copper is required in this Order.

When required, Section 1.4 of the SIP provides four methods that may be used to develop effluent limitations. These four methods include: (1) assigning a loading allocation based upon a completed TMDL (Total Maximum Daily Load); (2) use of a steady state model; (3) use of a dynamic model; or, (4) establishing effluent limitations that consider intake water pollutants.

The 2002 California 303(d) List and TMDL Priority Schedule identifies the Lower Mokelumne River as a Low priority. As a Low Priority TMDL, there is a high likelihood that this TMDL may not be started or completed for some time. Based upon the findings of other TMDL's nearing completion, it is also likely that in a final TMDL, waste load reductions will be apportioned to identified point sources, even if the discharge does not represent a significant contribution to the total load. Considering these findings, it appears inappropriate to delay development of effluent limitations pending development of wasteload allocations from a yet to be initiated TMDL. Reductions in copper loading, as required by this Order, may however be considered as contributing toward a future TMDL load reduction allocation.

Establishing effluent limitations that consider intake water credits appears to be an appropriate methodology for this situation. However, results of historical monitoring indicate temporal and spatial variations in copper concentrations exist within and between the upstream intake water, the downstream water, and the effluent. These variations are likely due in part to the timing of sample collection, influence of process retention time and wastestream compositing and the precision of laboratory analyses at the low concentrations being measured. Some of the reported detection limits have not been low enough to assess this variability. To apply intake credits in the development of effluent limitations, additional study and data collection are needed to both assess this variability and to quantify the mass of copper added to the wastestream by the Power House. Additional information is also needed to develop a monitoring program that provides for coordinated sampling and appropriate comparison between intake and effluent copper concentrations and mass for purposes of evaluating compliance. At this time, since additional sources of copper remain within the Power House processes and no process for removal of copper mass exists, the Discharger would be unable to immediately comply with a limitation that considers intake water pollutants since some incremental mass contribution remains.

Therefore, since; a TMDL has not been initiated and load allocations have not been developed or assigned, monitoring data indicate the receiving water lacks assimilative capacity, and, insufficient data have been collected to establish limits based upon intake water credits, final effluent limitations have been established at the point of discharge from Outfall 001 to the Mokelumne River. Final average monthly and daily maximum effluent limitations for copper (total) have been established in this Order in accordance with Sections 1.3 and 1.4 of the SIP using the adjusted copper criteria and a steady state model (with no dilution credit). These final limitations are to be adjusted accordingly with results of corresponding receiving water monitoring for upstream receiving water hardness as shown in Attachment D. Further information pertaining to calculation of these limitations is included in the Information Sheet.

The Camanche Power House has no processes specific to the removal of copper. Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit*." As the average monthly and maximum daily effluent limitations for copper are new requirements in this Order, the Discharger submitted a compliance schedule justification required by the SIP (Section 2.1). In this 18 June 2003 submission, the Discharger requested the maximum 5 year compliance time schedule be granted based upon the difficulties with achieving further reductions in copper emissions given available technologies. The justification outlined the need for further evaluation and assessment of effluent and receiving water copper concentrations and associated variability, the need to evaluate the feasibility of low concentration treatment technologies, and, the need to evaluate, fund, and schedule additional capital projects for copper parts replacement such as turbine seal modifications as necessary. The Discharger has made diligent efforts to quantify copper levels and identify sources of copper in the wastestream, and has implemented numerous source control and pollutant minimization

efforts. Therefore, considering these efforts and the complexities associated with further copper emission reductions, this Order includes a compliance time schedule for compliance with the final effluent limitations of 5 years. The final water quality based effluent limitations for copper become effective **1 October 2008**, and this Order includes a Provision outlining studies and a time schedule for compliance with the new, or alternative less stringent final effluent limitations for copper if appropriate (i.e. intake credits). Preliminary options for complying with the new or alternative final limitations may include:

a. Wastestream treatment,

b. Development and approval of a pollutant trading program proposal within the watershed, where some other source of copper may be removed from the watershed at a specified offset such that the net result is copper mass reduction within the 303d Listed Waterbody,

c. Continued efforts to eliminate all copper sources at the Power House including retrofit of the two remaining turbines with non-copper seals and wearing parts, and removal of all copper piping, valves etc., followed by development of an influent/effluent comparison monitoring program for compliance determination purposes, or

d. Development of a mass balance compliance alternative which considers intake water credits, quantification of the Power House copper mass contribution, and implementation of a copper removal process whereby the mass of copper removed is equivalent to the mass of copper the Power House contributes to the receiving water. Section 1.4.4. of the SIP provides further guidance on intake water credits for specific pollutants, as these credits pertain to establishing water quality based effluent limitations. A cursory review of the existing Power House use and discharge of water suggest the five (5) SIP Section 1.4.4. conditions for intake water credits would likely apply to this situation. As stated in Section 1.4.4., "…*the RWQCB may establish effluent limitations allowing the facility to discharge a mass and concentration of the intake water pollutant that is no greater than the mass and concentration found in the facility's intake water. A discharger may add mass of the pollutant to its waste stream, if an equal or greater mass is removed prior to discharge, so there is no net addition of the pollutant in the discharge compared to the intake water*."

Since not all historical data are of sufficient quality to assess compliance with the final limitations, this Order also requires the Discharger to collect data sufficient to determine compliance with these new final effluent limitations for copper. Detection of copper to 0.5 µg/L (ppb) is feasible in accordance with the SIP.

Upon completion of the studies required by this Order, the Order may be reopened, and based upon new information, alternative, less stringent final effluent limitations for copper may be

established considering a different method (i.e. intake water credits) prescribed by the SIP Section 1.4.

In accordance with the SIP, Sections 2.2.1 and 2.2.2, a numeric interim limitation for copper has been established in this Order based upon current facility performance. As shown in the Information Sheet, this interim limitation consists of a projected monthly average dissolved effluent copper concentration of 11.6 µg/L (ppb) derived using copper data summarized in Attachment C, and applying the statistical methodologies for estimating maximum concentrations identified in Chapter 3 of USEPA's Technical Support Document for Water Quality-based Toxics Control (TSD, 1991). Effluent data from Attachment C was used in developing this limitation, using dissolved copper concentrations. Dissolved copper concentration data were used in lieu of total concentration data due to the quality of dissolved data and significantly fewer 'non-detect' data points (2.9% non-detects for 35 dissolved concentration data points versus 41% non-detects for 41 total concentration data points).

13. Previous Order No. 94-003 included daily maximum and monthly average effluent limitations for **oil and grease**. Order No. 94-003 included a daily maximum limitation for oil and grease of 5.0 mg/L (ppm), and a monthly average limitation for oil and grease of 2.5 mg/L (ppm). The Basin Plan states that "*Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses*." The Discharger operates treatment facilities specific to the removal of oil and grease, and results of effluent monitoring indicate the treatment facilities, when properly operated, are capable of reducing concentrations of oil and grease below these existing limitations. Therefore, the daily maximum and monthly effluent limitations for oil and grease from Order No. 94-003 are retained in this new Order.

14. The beneficial uses of the underlying groundwater are municipal and domestic, industrial, and agricultural supply.

15. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and SWRCB Resolution 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

16. Effluent limitations, and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.

17. The action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of the California Environmental Quality Act (CEQA) (Public Relations Code Section 21000, et. Seq.), in accordance with Section 13389 of the California Water Code.

18. The Regional Board has considered the information in the attached Information Sheet in developing the Findings of this Order. The attached Information Sheet is part of this Order. Attachments A, B, C, and D are also a part of this Order.

19. The Regional Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for this discharge and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

20. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.

21. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect 50 days following permit adoption (effective 6 December 2003), provided EPA has no objections.

22. Any person adversely affected by this action of the Regional Board may petition the SWRCB to review the action. The petition must be received by the State Board Office of the Chief Counsel, P.O. Box 100, Sacramento, CA 95812-0100, within 30 days of the date the action was taken. Copies of the law and regulations applicable to filing petitions will be provided upon request.

IT IS HEREBY ORDERED that Order No. 94-003 is rescinded and that the East Bay Municipal Utility District, Camanche Dam Power House, its agents, successors and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, and the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, shall comply with the following:

A. Discharge Prohibitions:

1. Discharge of treated wastewater at a location or in a manner different from that described in Finding No. 2 is prohibited, except for modifications to install and operate additional facilities designed to improve the performance of the existing wastewater treatment system, as approved by the Board's Executive Officer.

2. Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the California Water Code.

3. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Standard Provision A.13 [See attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)].

B. Effluent Limitations: (Discharge from Outfall 001 to the Mokelumne River)

1. Effluent shall not exceed the following limits:

Constituents	Units	Daily Maximum	Monthly Average
Oil and Grease	mg/L (ppm)	5.0	2.5
	lbs/day	10[1]	4.8[1]
Copper (Total)	µg/L (ppb)	[2,3]	[2,3]
	lbs/day	[1,3,4]	[1,3,4]
Copper (Dissolved)	µg/L (ppb)	- - -	11.6[5]
	lbs/day	- - -	0.022[1,5]

[1] Based upon daily design treatment capacity of 0.23 mgd.
[2] Calculate limit based upon Attachment D.
[3] Final effluent limitations effective 1 October 2008.
[4] Using the concentration value (in mg/L) determined from Footnote 2, calculate the lbs per day using the formula: *x* mg/L x 8.345 x 0.23 mgd = *y* lbs/day.
[5] Interim limits effective through 30 September 2008.

2. The discharge shall not have a pH less than 6.5 nor greater than 8.5.

3. The daily maximum discharge flow shall not exceed 0.23 million gallons per day (mgd).

4. Survival of aquatic organisms in 96-hour acute bioassays of undiluted waste shall be no less than:

   Minimum for any one bioassay - - - - - - - - - 70%
   Median for any three or more consecutive bioassays - - - - 90%

C. Sludge Disposal:

1. Collected screenings, sludges, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste*, as set forth in Title 27, CCR, Division 2, Subdivision 1, Section 20005, et seq.

2. Any proposed change in sludge use or disposal practice from a previously approved practice shall be reported to the Executive Officer and EPA Regional Administrator at least **90 days** in advance of the change.

D. Receiving Water Limitations:

Receiving Water Limitations are based upon water quality objectives contained in the Basin Plan. As such, they are a required part of this permit.

The discharge shall not cause the following in the receiving water:

1. Concentrations of dissolved oxygen to fall below 7.0 mg/L (ppm). The monthly median of the mean daily dissolved oxygen concentration at this location shall not fall below 85 percent of saturation in the main water mass, and the 95^{th} percentile concentration shall not fall below 75 percent of saturation.

2. Any individual pesticide or combination of pesticides to be present in concentrations that adversely affect beneficial uses, and total identifiable persistent chlorinated hydrocarbon pesticides to be present in the water column at concentrations detectable within the accuracy of analytical methods approved by the Environmental Protection Agency or the Executive Officer.

3. Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or on the stream bottom.

4. Oils, greases, waxes, floating material (liquids, solids, foams, and scums) or suspended material to create a nuisance or adversely affect beneficial uses.

5. Aesthetically undesirable discoloration.

6. Fungi, slimes, or other objectionable growths.

7. The turbidity to increase as follows:

    a. More than 1 Nephelometric Turbidity Units (NTUs) where natural turbidity is between 0 and 5 NTUs.

    b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.

    c. More than 10 NTUs where natural turbidity is between 50 and 100 NTUs.

    d. More than 10 percent where natural turbidity is greater than 100 NTUs.

8. The normal ambient pH to fall below 6.5, exceed 8.5, or change by more than 0.5 pH units.

9. Deposition of material that causes nuisance or adversely affects beneficial uses.

10. The normal ambient temperature to increase more than 5°F.

11. Radionuclides to be present in concentrations that exceed maximum contaminant levels specified in the California Code of Regulations, Title 22; that harm human, plant, animal or aquatic life; or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

12. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.

13. Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.

14. Violations of any applicable water quality standard for receiving waters adopted by the Regional Board, the State Water Resources Control Board, or the U.S. Environmental Protection Agency pursuant to the CWA and regulations adopted thereunder.

15. Taste or odor-producing substances to impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin or to cause nuisance or adversely affect beneficial uses.

E. Groundwater Limitations: The discharge shall not cause the underlying groundwater to be degraded.

F. Provisions:

1. The Discharger shall comply with Monitoring and Reporting Program No. R5-2003-0153, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

2. **Copper, Effluent Limitation Time Schedule**: Effluent Limitation B.1. requires the Discharger to comply with new monthly average and daily maximum effluent limitations for total copper. The new final water quality based effluent limitations for copper required by this Order shall become effective on **1 October 2008**. The Discharger shall comply with the following time schedule in order to study and implement measures necessary to

comply with these new limitations, or comply with alternative final limitations developed using a methodology prescribed by Section 1.4 of the SIP.

Task	Compliance Date
Submit Compliance Alternatives Study Workplan	**1 March 2004**
Submit Compliance Alternatives Study Report	**1 July 2005**
Select Alternative(s)	**1 October 2005**
Submit Implementation Plan and Time Schedule for Selected Alternative(s)	**1 January 2006**
Achieve Full Compliance	**1 October 2008**

The Discharger shall submit to the Regional 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 being reported, the reasons for such noncompliance shall be stated, plus an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Board by letter when it returns to compliance with the time schedule.

Additional copper data must be provided with a minimum detection level below the controlling water quality criterion concentration. Based upon the findings of these studies and additional data collection, this Order may be reopened, and alternative final limits established for copper. As this schedule is greater than one year, the Discharger shall submit semi-annual progress reports on **15 January** and **15 July** each year until the Discharger achieves compliance with the final water quality based effluent limitations for copper.

3. **Chronic Toxicity Testing:** The Discharger shall conduct the chronic toxicity testing specified in the Monitoring and Reporting Program. If the testing indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above the water quality objective for toxicity, the Discharger shall initiate a Toxicity Identification Evaluation (TIE) to identify the causes of toxicity. Upon completion of the TIE, the Discharger shall submit a workplan to conduct a Toxicity Reduction Evaluation (TRE) and, after Regional Board evaluation, conduct the TRE. This Order will be reopened and a chronic toxicity limitation included and/or a limitation for the specific toxicant identified in the TRE included. Additionally, if a chronic toxicity water quality objective is adopted by the SWRCB, this Order may be reopened and a limitation based on that objective included.

4. **Adoption of new Minimum Level's (ML's):** Where an approved laboratory analytical method and associated ML cannot, at this time, determine whether a CTR or NTR constituent is present in the discharge above the applicable criteria, the Discharger shall resample for these constituents if new ML's are adopted by the SWRCB.

5. **Reopeners**: This Order may be reopened and effluent and/or receiving water limitations modified based on information, including information on copper, mercury and thallium, supplied as required by this Order.

6. The Discharger shall comply with all the items of the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)", dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as "Standard Provisions."

7. The Discharger shall use the best practicable control to limit mineralization to no more than a reasonable increment.

8. This Order expires on **15 October 2008** and the Discharger must file a Report of Waste Discharge in accordance with Title 23, CCR, not later than 180 days in advance of such date in application for renewal of waste discharge requirements if it wishes to continue the discharge.

9. Prior to making any change in the discharge point, place of use, or purpose of use of the wastewater, the Discharger shall obtain approval of or clearance from the SWRCB (Division of Water Rights).

10. In the event of any change in control or ownership of land or waste discharge facilities recently owned or controlled by the Discharger, the Discharger shall 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.

11. To assume operation 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, address and telephone number of the persons responsible for contact with the Regional Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision D.6 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 California Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.

I, THOMAS R. PINKOS, 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 17 October 2003.

JME

THOMAS R. PINKOS, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2003-0153

NPDES NO. CA0082040
FOR
EAST BAY MUNICIPAL UTILITY DISTRICT
CAMANCHE DAM POWER HOUSE
SAN JOAQUIN COUNTY

This Monitoring and Reporting Program is issued pursuant to Water Code Division 7, Chapter 5.5. The Discharger shall not implement any changes to this Program unless and until the Regional Board or Executive Officer issues a revised Monitoring and Reporting Program. Specific sample station locations shall be established under direction of the Regional Board's staff, and a description of the stations shall be attached to this Order.

EFFLUENT MONITORING

Effluent samples shall be collected downstream from the last connection through which wastes can be admitted into the outfall. Time of collection of samples shall be recorded. Samples collected from the outlet of the separation/retention pond (Outfall 001) shall be considered adequately composited. The Effluent monitoring shall include at least the following:

Constituents	Units	Type of Sample	Frequency
Flow	mgd	Cumulative/Meter	Continuous
Oil and Grease	mg/L (ppm)	Grab	Twice Monthly
Copper (Total and Dissolved)[1]	µg/L (ppb) lbs/day	Grab	Twice Monthly
Zinc (Total)[1]	µg/L (ppb) lbs/day	Grab	Twice Monthly
Hardness (as $CaCO_3$)[3]	mg/L (ppm)	Grab	Twice Monthly
pH[2]	pH units	Grab	Monthly
Electrical Conductivity @25°C[2]	µmhos/cm	Grab	Monthly
Temperature[2]	°F	Grab	Monthly
Dissolved Oxygen[2]	mg/L (ppm)	Grab	Monthly
Total Suspended Solids	mg/L (ppm)	Grab	Monthly
Thallium (Total)[1]	µg/L (ppb) lbs/day	Grab	Monthly
Turbidity[2]	NTU	Grab	Monthly
Mercury[1]	µg/L (ppb)	Grab	Quarterly

Constituents	Units	Type of Sample	Frequency
Acute Toxicity[4]	% Survival	Grab	Annually

[1] At a minimum the Discharger shall comply with the Monitoring Requirements for these constituents as outlined in Section 2.3 and 2.4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP), adopted 2 March 2000 by the State Water Resources Control Board. For each priority pollutant use an analytical method from the SIP, Appendix 4 with a Minimum Level (ML) below all applicable pollutant criteria. In accordance with Section 2.4.2 of the SIP, the Discharger is to instruct the laboratory analyzing samples for priority pollutants to establish calibration standards so that the ML is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve. Report all peaks identified by the EPA test methods.

[2] Field Measurements.

[3] Concurrent with metals monitoring.

[4] The acute bioassays samples shall be analyzed using EPA-821-R-02-012, Fifth Edition, or later amendment with Board staff approval. Temperature and pH shall be recorded at the time of bioassay sample collection. Test species shall be fathead minnows (Pimephales promelas).

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

RECEIVING WATER MONITORING

All receiving water samples shall be grab samples. Receiving water monitoring shall include at least the following:

Station	Description
Mokelumne River, R-1	200 feet upstream from the point of discharge
Mokelumne River, R-2	500 feet downstream from the point of discharge

Constituents	Units	Station	Sampling Frequency
Flow[1]	cfs	R-1	Monthly
Copper (Total)[2]	µg/L (ppb)	R-1, R-2	Twice Monthly
Zinc (Total)[2]	µg/L (ppb)	R-1, R-2	Twice Monthly
Hardness (as $CaCO_3$)[4]	mg/L (ppm)	R-1, R-2	Twice Monthly
pH[3]	pH Units	R-1, R-2	Monthly
Electrical Conductivity @25°C[3]	µmhos/cm	R-1, R-2	Monthly
Dissolved Oxygen[3]	mg/L (ppm)	R-1, R-2	Monthly

Constituents	Units	Station	Sampling Frequency
Temperature[3]	°F	R-1, R-2	Monthly
Thallium[2]	µg/L (ppb)	R-1, R-2	Monthly
Total Suspended Solids	mg/L (ppm)	R-1, R-2	Monthly
Turbidity[3]	NTU	R-1, R-2	Monthly
Mercury[2]	µg/L (ppb)	R-1, R-2	Quarterly

[1] Estimate of receiving water flow, recorded for each day of sample collection.

[2] At a minimum the Discharger shall comply with the Monitoring Requirements for these constituents as outlined in Section 2.3 and 2.4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP), adopted 2 March 2000 by the State Water Resources Control Board. For each priority pollutant use an analytical method from the SIP, Appendix 4 with a Minimum Level (ML) below all applicable pollutant criteria. In accordance with Section 2.4.2 of the SIP, the Discharger is to instruct the laboratory analyzing samples for priority pollutants to establish calibration standards so that the ML is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve. Report all peaks identified by the EPA test methods.

[3] Field Measurements.

[4] Concurrent with metals monitoring.

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations R-1 and R-2. Attention shall be given to the presence of:

a. Floating or suspended matter
b. Discoloration
c. Bottom deposits
d. Aquatic life
e. Visible films, sheens or coatings
f. Fungi, slimes, or objectionable growths
g. Potential nuisance conditions

Notes on receiving water conditions shall be summarized in the monitoring reports.

THREE SPECIES CHRONIC TOXICITY MONITORING

Chronic toxicity monitoring shall be conducted to determine whether the effluent is contributing toxicity to the Mokelumne River. The testing shall be conducted as specified in USEPA Method EPA-821-R-02-013, Fourth Edition, or later amendment. Chronic toxicity samples shall be collected at the discharge of the separation/retention pond prior to its entering the Mokelumne River. Grab samples shall be representative of the volume and quality of the discharge. Time of collection samples shall be recorded. The effluent tests must be conducted with concurrent reference toxicant tests. Both the reference toxicant and effluent test must meet all test acceptability criteria as specified in the chronic manual. If the test acceptability criteria are not achieved, then the Discharger must re-sample and re-test within 14 days. Chronic toxicity monitoring shall include the following:

Species: *Pimephales promelas, Ceriodaphnia dubia, and Selenastrum capricornutum*
Frequency: Annually

The Discharger shall conduct the chronic toxicity test using two controls and a minimum of 5 effluent concentrations, using the dilution series listed below:

Dilution Series:	Dilutions (%)					Controls	
	100	50	25	12.5	6.25	River Water	Lab Water
% Pond Effluent	100	50	25	12.5	6.25	0	0
% Dilution Water*	0	50	75	87.5	93.75	100	0
% Lab Water	0	0	0	0	0	0	100

* Dilution water shall be receiving water from the Mokelumne River taken upstream from the discharge point.

REPORTING

Monitoring reports shall be submitted to the Regional Board by the **first day** of the second month following sample collection**. A**nnual monitoring results shall be submitted by the **first day of the second month following each calendar year,** respectively.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements. The highest daily maximum for the month, monthly and weekly averages, and medians, and should be determined and recorded.

If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

By **1 February** of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

a. The names and telephone numbers of persons to contact regarding the plant for emergency and routine situations.

b. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.6).

c. A statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the wastewater treatment facilities as currently constructed and operated, and the dates when these documents were last revised and last reviewed for accuracy.

The Discharger may also be requested to submit an annual report to the Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provision D.6.

The Discharger shall implement the above monitoring program on the first day of the month following effective date of this Order.

Ordered By: THOMAS R. PINKOS, Executive Officer

17 October 2003

JME

INFORMATION SHEET

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2003-0153
EAST BAY MUNICIPAL UTILITY DISTRICT
CAMANCHE DAM POWER HOUSE
SAN JOAQUIN COUNTY

Site Description and Background
The East Bay Municipal Utility District (EBMUD), (hereafter Discharger) submitted a Report of Waste Discharge (RWD), dated 26 June 1998, and applied for a permit renewal to discharge waste under the National Pollutant Discharge Elimination System (NPDES) from the Camanche Dam Power House. Supplemental information to complete the RWD was submitted on 6 June 2003.

The Discharger owns and operates an industrial wastewater collection, treatment, and disposal system at the Camanche Dam Power House. Within the Power House, drainage, washdown, and leakage water which contain lubricating oil and other petroleum products are collected in a sump, treated with a belt skimmer, then pumped to a 20,000 gallon oil separation/retention pond outside the Power House. The source of the process wastewater is water derived from the Mokelumne River at the Camanche Power House. The Power House and separation/retention pond are in Section 32, T2N, R7E, MDB&M, as shown on Attachment A, a part of this Order. Within the separation/retention pond, additional oil is removed with a rope skimmer and a series of separation baffles. Treated industrial wastewater is subsequently discharged from the pond via Outfall 001 to the Mokelumne River, a water of the United States, at the point lattitude 38°, 13', 12" and longitude 121°, 01', 31" also as shown in Attachment A.

The Report of Waste Discharge describes the existing discharge as follows:

Monthly Average Dry Weather Flow:	0.09	million gallons per day (mgd)
Daily Peak Wet Weather Flow:	0.23	mgd
Design Flow:	0.23	mgd
Average Temperature:	63°F Summer; 54°F Winter	

Constituent	mg/L	lbs/day*
Oil and Grease	2.5	1.9

* Based upon Monthly Average Dry Weather Flow

Previous Order
The discharge of treated industrial wastewater to the Mokelumne River was previously regulated by Waste Discharge Requirements (WDR) Order No. 94-003, NPDES Permit No. CA0082040, which was adopted by the Regional Board on 28 January 1994. Under this Order, the Discharger was permitted to discharge a maximum of 0.23 million gallons per day (mgd) of treated industrial wastewater to the Mokelumne River.

Basin Plan
The Regional Board adopted a *Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins* (hereafter Basin Plan). The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. These requirements implement the Basin Plan.

Receiving Water

The Lower Mokelumne River flows east to west from Camanche Reservoir to the Delta. Controlled releases from Camanche Dam provided sustained flows throughout the year, ranging from 100 to 3,232 mgd. Outfall 001 discharges the treated industrial wastewater from the Power House to the Mokelumne River downstream of the Camanche Dam. Twenty-eight miles of the Lower Mokelumne River, from Camanche Reservoir toward the Delta (Hydro Unit 531.200), have been identified as a Water Quality Limited Segment under section 303(d) of the Clean Water Act (CWA). The list of pollutants for which the Lower Mokelumne River is impaired appears on a list (the "California 303(d) List"), which was updated in 2002 and approved by the State Water Resources Control Board (SWRCB) in February 2003. Pollutants identified on the California 303(d) List as impairing the Mokelumne River include copper and zinc. Resource extraction is identified as the primary source of these pollutants. The EBMUD discharge from the Camanche Dam Power House separation/retention pond occurs within the copper and zinc impaired region of the Mokelumne River.

Beneficial Uses

The existing beneficial uses of the Mokelumne River, from Camanche Reservoir to the Delta, as identified in Table II-1 of the Basin Plan include: agricultural supply (AGR) including both irrigation and stock watering; body contact recreation, canoeing and rafting, (REC-1); and other non-body contact recreation (REC-2); warm freshwater aquatic habitat (WARM); cold freshwater aquatic habitat (COLD); migration of warm and cold freshwater aquatic organisms (MIGR), spawning, reproduction, and/or early development of warm and cold freshwater aquatic organisms (SPWN); and wildlife habitat (WILD). In addition, State Board Resolution No. 88-63, incorporated into the Basin Plan pursuant to Regional Board Resolution No. 89-056, provides that "*Where a a body of water is not currently designated as MUN* (municipal and domestic supply beneficial use) *but, in the opinion of a Regional Board, is presently or potentially suitable for MUN, the Regional Board shall include MUN in the beneficial use designation*. " Based upon ambient receiving water data collected by the Discharger, the Mokelumne River, from Camanche Reservoir to the Delta, is suitable for MUN, therefore the MUN use is also designated as a beneficial use of this water body.

The Basin Plan on page II-1.00 states: "Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning…" and with respect to disposal of wastewaters states that "... disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses."

CTR, NTR, and SIP

USEPA adopted the *National Toxics Rule* (NTR) on 22 December 1992 and amended it on 4 May 1995 and 9 November 1999 and the *California Toxics Rule* (CTR) on 18 May 2000 and amended it on 13 February 2001. These Rules contain water quality standards applicable to this discharge. The SWRCB adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (known as the State Implementation Policy or SIP) on 2 March 2000, which contains guidance on implementation of the NTR and the CTR.

Reasonable Potential Analysis

Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numeric water quality standard. Beneficial uses, together with their corresponding water quality objectives, constitute the state water quality standards for purposes of compliance with the CWA.

In determining whether a discharge has the reasonable potential to contribute to an in-stream excursion (reasonable potential analysis), the dilution of the effluent in the receiving water may be considered where areas of dilution are defined. The available dilution may also be used to calculate protective effluent limitations by applying water quality criteria at the edge of the defined mixing zone. These calculations include receiving water pollutant concentrations that are typically based on worst-case conditions for flow and concentration.

If limited or no dilution is available, effluent limitations are set equal to the applicable water quality criteria or objectives, which are applied at the point of discharge so the discharge will not cause the receiving stream to exceed water quality objectives established to protect the beneficial uses. In situations where receiving water flows are substantially greater than effluent flows, dilution may be considered in establishing effluent limitations. However, when a receiving water is impaired by a particular pollutant or stressor, limited or no pollutant assimilative capacity may be available in spite of the available dilution. In these instances, and depending upon the nature of the pollutant, effluent limitations may be set equal to or less than the applicable water quality criteria or objectives that are applied at the point of discharge such that the discharge will not cause or contribute to the receiving stream excursion above water quality objectives established to protect the beneficial uses.

In most situations, EPA's NPDES regulations require that limits for metals in permits be stated as total recoverable. Since most water quality criteria are expressed in the dissolved form, it is necessary to translate between dissolved metal in ambient waters and total recoverable metal in effluent. EPA guidance on the use of translators provides three options including, (1) assuming the translator equivalent to the criteria guidance conversion factor, (2) developing a translator directly as the ratio of dissolved to total recoverable metal, and/or, (3) developing a translator through the use of a partitioning coefficient. Reasonable potential analysis for this permit was conducted using the first option, applying criteria guidance conversion factors. To assure that metals criteria are appropriate for the chemical conditions under which they are applied, EPA also provides for adjustment of the criteria through application of the water-effect ratio (WER). The WER approach compares bioavailability and toxicity of a specific pollutant in receiving waters and in laboratory waters. This reasonable potential analysis was conducted using a WER default value of 1. As described in the CTR, freshwater aquatic life criteria for certain metals are expressed as a function of hardness, since hardness, and/or water quality characteristics that are usually correlated with hardness can reduce or increase the toxicities of some metals. Hardness is used as a surrogate for a number of water quality characteristics which affect the toxicity of metals in a variety of ways. To ensure the level of protection intended by the EPA's 1985 Guidelines for hardness is maintained or

exceeded, the minimum observed hardness of the upstream water that does not contain effluent was used to adjust the applicable criterion.

On 10 September 2001 the Executive Officer of the Regional Board issued a letter pursuant to Section 13267 of the California Water Code (CWC) requiring all NPDES Dischargers to conduct effluent and receiving water monitoring and submit results of this monitoring in accordance with a time schedule provided in the letter. The Discharger conducted a study to determine whether levels of NTR, CTR, or other pollutants in the discharge have the reasonable potential to cause or contribute to an in-stream excursion above a numeric or narrative water quality standard, including Basin Plan numeric or narrative objectives.

Results of this study were submitted on 28 February 2003. Some constituents monitored in this study were not detected at concentrations equal to or greater than appropriate analytical technique Minimum Levels (ML's) specified by Appendix 4 of the SIP. Where an approved laboratory analytical method and associated ML could not, at this time, determine whether an analyte is present in the discharge above the applicable criteria, a Provision of this Order requires resampling for the constituent if new ML's are adopted by the SWRCB.

Results of this study, and routine effluent and receiving water monitoring conducted by the Discharger, indicate the discharge has the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numeric water quality standard for copper and oil and grease. As required by 40 CFR Part 122.44 (d)(1)(i)-(iii), this Order includes effluent limitations for copper and oil and grease. Additional information is needed to complete the reasonable potential analysis for mercury, and thallium. This Order includes additional monitoring requirements for these constituents, and may be reopened to include effluent limitations for these constituents if necessary.

Copper
Previous Order No. 94-003 included proposed effluent limitations for copper based upon water quality objectives established by the California Inland Surface Waters Plan. Order No. 94-003 required the Discharger to conduct a study of copper concentrations in the effluent and receiving water, and available dilution. The Discharger completed and submitted the required study, but the Order was not reopened, and limitations for copper were not established.

The flow of treated industrial wastewater from the Camanche Power House Outfall 001 is minimal in comparison with Mokelumne River flows. At the maximum discharge flowrate of 0.23 mgd, the dilution factor of river water to discharge would range from a minimum of 435:1 to a maximum of 14,052:1. However, as noted above, the Lower Mokelumne River is identified as impaired for copper. Attachment C summarizes results of monitoring for total and dissolved copper in the receiving water and effluent since January 2000, when numerous changes were made to the Power House in an effort to reduce effluent copper concentrations. As shown in Attachment C, results of receiving water monitoring indicate several instances where the ambient hardness of the Mokelumne River is as low as 14 milligrams per Liter (mg/L), with total and dissolved

concentrations of copper in the intake water, prior to use exceeding the adjusted freshwater aquatic life water quality acute and chronic criteria for copper published in the USEPA's California Toxics Rule. Based upon this ambient water column data, the receiving water lacks assimilative capacity.

The Discharger has conducted investigations and studies to identify and quantify sources of copper which may be entrained in the wastestream. Copper sources identified during these studies included erosion and electrochemical corrosion of the piping and cooling equipment, with the higher sources attributed to air compressor blowdown and seal bypass water. The highest total copper concentrations were measured in the turbine shaft seal reservoir area, at a Kinney strainer used to filter seal water, and at the heat exchangers for the two air compressors. The Discharger has worked to both eliminate sources of copper and reduce the amount of process wastewater generated by the Power House; the seal water strainers have been replaced, flow measuring rotometers have been removed, sample ports and fittings have been changed out, and, the seals of one turbine have been retrofit with non-copper wearing surfaces. New seal packages have resulted in significantly less leakage, and combined with minimized compressor cooling flows, have resulted in a significant reduction in wastewater volumes and copper contributions. The copper contribution from the Power House processes has been reduced to the point where it may be statistically indiscernible from background given existing sampling and analytical error (SAE).

However, there are remaining components of the Power House that release additional copper to the wastestream. This incremental increase in copper, combined with a documented lack of assimilative capacity in the Lower Mokelumne River and CWA 303d Listing means that copper may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above the numeric water quality standard for copper. As shown in Attachment C, both the maximum effluent concentration (MEC) and the observed maximum ambient background concentration (B) have exceeded the adjusted criteria. Section 1.3 of the SIP requires a water quality based effluent limitation when the MEC or B exceed appropriate pollutant criterion. Therefore, a water quality based effluent limitation for copper is required in this Order.

When required, Section 1.4 of the SIP provides four methods that may be used to develop effluent limitations. These four methods include: (1) assigning a loading allocation based upon a completed TMDL (Total Maximum Daily Load); (2) use of a steady state model; (3) use of a dynamic model; or, (4) establishing effluent limitations that consider intake water pollutants.

The 1998 California 303(d) List and TMDL Priority Schedule identifies Lower Mokelumne River as a Low priority, with a projected TMDL program start date of January 2004, and a projected end date of December 2011. As a Low Priority TMDL, there is a high likelihood that this TMDL may not be started or completed as scheduled. Based upon the findings of other TMDL's nearing completion, it is also likely that in a final TMDL, waste load reductions will be apportioned to identified point sources, even if the discharge does not represent a significant contribution to the total load. Considering these findings, it appears inappropriate to delay development of effluent limitations pending development of wasteload allocations from a yet to be initiated TMDL.

Reductions in copper loading, as required by this Order, may however be considered as contributing toward a future TMDL load reduction allocation.

Establishing effluent limitations that consider intake water credits appears to be an appropriate methodology for this situation. However, results of historical monitoring indicate temporal and spatial variations in copper concentrations exist within and between the upstream intake water, the downstream water, and the effluent. These variations are likely due in part to the timing of sample collection, influence of process retention time and wastestream compositing and the precision of laboratory analyses at the low concentrations being measured. Some of the reported detection limits have not been low enough to assess this variability. To apply intake credits in the development of effluent limitations, additional data collection is needed to both assess this variability and to quantify the mass of copper added to the wastestream by the Power House. Additional information is also needed to develop a monitoring program that provides for coordinated sampling and appropriate comparison between intake and effluent copper concentrations and mass for purposes of evaluating compliance. At this time, since additional sources of copper remain within the Power House processes and no process for removal of copper mass exists, the Discharger would be unable to immediately comply with a limitation that considers intake water pollutants since some incremental mass contribution remains. This Order allows for development of copper effluent and receiving water data necessary for the consideration of intake water credits. This Order includes a reopener for modifying final effluent and/or receiving water limitations based on information supplied by the Discharger.

Therefore, since; a TMDL has not been initiated and load allocations have not been developed or assigned, monitoring data indicate the receiving water lacks assimilative capacity, and, insufficient data has been collected to establish limits based upon intake water credits, final effluent limitations have been established at the point of discharge from Outfall 001 to the Mokelumne River. In accordance with Sections 1.3 and 1.4 of the SIP, using the adjusted copper criteria and a steady state model (with no dilution credit) these limitations shall be established as follows:

Since a site-specific translator has not been developed for copper as described in the SIP Section 1.4.1, the USEPA conversion factor was used in expressing the dissolved copper criterion as total recoverable. Acute and chronic effluent concentration allowance's (ECA's) shall be set equal to the adjusted acute and chronic copper criterion (criterion adjusted based upon observed receiving water hardness), and the most limiting long-term average (LTA) discharge condition for copper shall be determined using Table 1 of the SIP, using a coefficient of variation (CV) of 0.658 (CV obtained from the effluent total copper concentration data from Attachment C). An example of the average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for total copper at an observed receiving water hardness of 14 mg/L (ppm) as CaCO3, using the calculated CV and the multipliers in Table 2 of the SIP is shown below:

WATER QUALITY BASED EFFLUENT LIMITATIONS	
Copper (Total)	
Number of Observations (Attachment C)	41
Effluent Maximum	13.1
Dilution Credit	0
ECA acute (@ 14 mg/L (ppm) hardness as CaCO3)	2.2 µg/L
ECA chronic (@ 14 mg/L (ppm) hardness as CaCO3)	1.7 µg/L
Percent of Observations Below Detection	41%
Coefficient of Variation (Calculated)	0.658
LTA acute	0.66
LTA chronic	0.87
Limiting LTA (acute) = (ECA acute *Table 1 Acute Multiplier)	0.66
Sampling Frequency (n)	≤ 4/mo
AMEL (LTA*Table 2 AMEL Multiplier)	**1.1 µg/L (ppb)**
MDEL (LTA*Table 2 MDEL Multiplier)	**2.2 µg/L (ppb)**

Using these calculations, a final AMEL of 1.1 µg/L (ppb) and MDEL of 2.2 µg/L (ppb) for copper (total) would result at an observed receiving water hardness of 14 mg/L (as CaCO3) in accordance with Sections 1.3 and 1.4 of the SIP using the adjusted copper criteria. The final AMEL and MDEL in this Order are to be adjusted accordingly with results of corresponding receiving water monitoring for upstream receiving water hardness as shown in Attachment D.

The Camanche Power House has no processes specific to the removal of copper. Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit*." As the average monthly and maximum daily effluent limitations for copper are new requirements in this Order, the Discharger submitted a compliance schedule justification required by the SIP (Section 2.1). In this 18 June 2003 submission, the Discharger requested the maximum 5 year compliance time schedule be granted based upon the difficulties with achieving further reductions in copper emissions given available technologies. The justification outlined the need for further evaluation and assessment of effluent and receiving water copper concentrations and associated variability, the need to evaluate the feasibility of low concentration treatment technologies, and, the need to evaluate, fund, and schedule additional capital projects for copper parts replacement such as turbine seal modifications as necessary. The Discharger has made diligent efforts to quantify copper levels and identify sources of copper in the wastestream, and has implemented numerous source control and pollutant minimization efforts. Therefore, considering these efforts and the complexities associated with further copper emission reductions, this Order includes a compliance time schedule for compliance with the final effluent limitations of 5 years. The final water quality based effluent limitations for copper become effective **1 October 2008**, and this Order includes a Provision outlining studies and a time schedule for compliance with the new, or alternative less stringent final effluent limitations for copper if appropriate (i.e. intake credits).

Preliminary options for complying with the new or alternative final limitations may include:

a. Wastestream treatment,

b. Development and approval of a pollutant trading program proposal within the watershed, where some other source of copper may be removed from the watershed at a specified offset such that the net result is copper mass reduction within the 303d Listed Waterbody,

c. Continued efforts to eliminate all copper sources at the Power House including retrofit of the two remaining turbines with non-copper seals and wearing parts, and removal of all copper piping, valves etc., followed by development of an influent/effluent comparison monitoring program for compliance determination purposes, or

d. Development of a mass balance compliance alternative which considers intake water credits, quantification of the Power House copper mass contribution, and implementation of a copper removal process whereby the mass of copper removed is equivalent to the mass of copper the Power House contributes to the receiving water. Section 1.4.4. of the SIP provides further guidance on intake water credits for specific pollutants, as these credits pertain to establishing water quality based effluent limitations. A cursory review of the existing Power House use and discharge of water suggest the five (5) SIP Section 1.4.4. conditions for intake water credits would likely apply to this situation. As stated in Section 1.4.4., "…*the RWQCB may establish effluent limitations allowing the facility to discharge a mass and concentration of the intake water pollutant that is no greater than the mass and concentration found in the facility's intake water. A discharger may add mass of the pollutant to its waste stream, if an equal or greater mass is removed prior to discharge, so there is no net addition of the pollutant in the discharge compared to the intake water*."

Since not all historical data are of sufficient quality to assess compliance with the final limitations, this Order also requires the Discharger to collect data sufficient to determine compliance with these new final effluent limitations for copper. Detection of copper to 0.5 µg/L (ppb) is feasible in accordance with the SIP.

Upon completion of the studies required by this Order, the Order may be reopened, and based upon new information, alternative, less stringent final effluent limitations for copper may established considering a different method (i.e. intake water credits) prescribed by the SIP Section 1.4.

In accordance with the SIP, Sections 2.2.1 and 2.2.2, a numeric interim limitation for copper has been established in this Order based upon current facility performance. As shown below, this interim limitation consists of a projected monthly average dissolved effluent copper concentration of 11.6 µg/L (ppb) derived using copper data summarized in Attachment C, and applying the statistical methodologies for estimating maximum concentrations identified in Chapter 3 of USEPA's Technical Support Document for Water Quality-based Toxics Control (TSD, 1991). Effluent data from Attachment C was used in developing this limitation, using dissolved copper concentrations. Dissolved copper concentration data was used in lieu of total concentration data due to the quality of dissolved data and significantly fewer 'non-detect' data points (2.9% non detects for 35 dissolved concentration data points versus 41% non detects for 41 total concentration data points).

Where concentrations in Attachment C were reported as less than detectable, one half of the detection limit was used in the calculation. Derivation of this interim copper limitation is summarized below:

INTERIM EFFLUENT LIMITATIONS	
Copper (dissolved)	
Number of Observations	35
Minimum (µg/L, ppb)	0.87
Observed Maximum (µg/L, ppb)	***8.3***
Mean	2.55
Standard Deviation	1.53
Coefficient of Variation	0.6
Multiplier[1]	1.4
Projected Monthly Average	**11.6 (µg/L, ppb)**

[1] From TSD Table 3-2

Oil and Grease

Previous Order No. 94-003 included daily maximum and monthly average effluent limitations for oil and grease. Order No. 94-003 included a daily maximum limitation for oil and grease of 5.0 mg/L (ppm), and a monthly average limitation for oil and grease of 2.5 mg/L (ppm). The Basin Plan states that "*Waters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses*." The Discharger operates treatment facilities specific to the removal of oil and grease, and results of effluent monitoring indicate the treatment facilities, when properly operated, are capable of reducing concentrations of oil and grease below these existing limitations. Therefore, the daily maximum and monthly effluent limitations for oil and grease from Order No. 94-003 are retained in this new Order.

Toxicity

The narrative toxicity objective of the Basin Plan states, in part, that: All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. At Section 4, the SIP establishes minimum

toxicity control requirements for implementing the narrative toxicity objective of the Basin Plan. These requirements include determining compliance with the Basin Plan narrative toxicity objective, in part, through the use of short-term chronic toxicity testing. While this Order includes numeric effluent limitations for constituents which have the reasonable potential to exceed acute and/or chronic aquatic life criteria, it also requires the continued use of short-term acute and chronic whole effluent toxicity (WET) tests as part of the weight of evidence approach to assessing toxics control and chronic toxicity.

JME