

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0121

NPDES NO. CA0082350

WASTE DISCHARGE REQUIREMENTS  
FOR  
STATE OF CALIFORNIA  
DEPARTMENT OF FISH AND GAME  
AND  
DEPARTMENT OF WATER RESOURCES  
FEATHER RIVER FISH HATCHERY-  
THERMALITO ANNEX FACILITY  
BUTTE COUNTY

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

1. The State of California, Department of Fish and Game (DFG) and Department of Water Resources (DWR) submitted a Report of Waste Discharge, dated 11 September 1998, and applied for a permit renewal to discharge wastewater under the National Pollution Discharge Elimination System (NPDES) for the Feather River Fish Hatchery – Thermalito Annex Facility (Facility) located near Oroville. The permit renewal application was deemed complete on 15 October 1998, although additional information was requested from the Discharger, including a description of operational changes made at the Facility and the results from a preliminary dye study conducted in the Thermalito Afterbay. The results of the dye study were received in January 2000.
2. The Facility is owned by the Department of Water Resources and operated by the Department of Fish and Game. The Department of Water Resources and the Department of Fish and Game are designated hereafter as the Discharger.
3. The discharge is presently governed by Order No. 94-092 (NPDES No. CA0082350), adopted by the Regional Board on 22 April 1994.
4. The Facility is located on Assessor's Parcel No. 030-320-017, adjacent to the western shoreline of the Thermalito Afterbay, near Oroville, in Section 10, T19N, R3E, as shown on Attachment A, which is incorporated herein and made part of this Order. The Facility lies on the eastern edge of the Butte Basin Hydrologic Area (HA) No. 520.40, as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986. The wastewater discharge from the Facility is pumped over a levee embankment into the Thermalito Afterbay, a separate Hydrologic Area of the Lower Feather River HA No. 515.40.
5. The U.S. Environmental Protection Agency (USEPA) and the Regional Board have classified this discharge as a minor discharge.

6. The Facility is a fish-rearing annex of the main Feather River Fish Hatchery located in Oroville. Fry are hatched at the Feather River Hatchery and transported to the Facility by tanker truck. Fry are reared at the Facility for only four to six months, typically January through June. After four months, the fingerlings are transported back to the Feather River Hatchery and raised to smolt size prior to release. An average of 67,630 pounds of Chinook salmon were reared annually at the Facility from 1998 through 2003. Small quantities of steelhead fry and fish for the inland program are also raised at the Facility from September to November. The Facility is close the remainder of the year.
7. The Facility is the preferred fish rearing site for the Feather River Fish Hatchery because it has significantly warmer water than the Feather River Hatchery, thus reducing the incidence of cold water viruses affecting the fry and fingerlings. Fish egg incubation does not occur at the Facility, as all the egg incubation occurs at the Feather River Fish Hatchery.
8. The Facility has a permanent residential trailer for a full-time caretaker, a domestic wastewater holding tank, an office and maintenance building, an aeration tower for the water supply and four parallel concrete raceways (approximately 600 feet long). The Discharger pumps raw water from five adjacent groundwater wells operated by DWR. Groundwater is pumped to an aeration tower and piped to the four raceway headworks. Currently, a minimum of 3.35 mgd (5.2 cfs) of aerated water flows through the Facility, with a design maximum of 7.8 mgd (12.1 cfs). Each of the four raceways uses a minimum of 0.863 mgd (1.3 cfs) of flow-through water, and a design maximum of 1.95 mgd (3.03 cfs). Each raceway drains directly into one of the two sump basins, each with a separate sump pump. Wastewater is pumped from each sump basin directly into the discharge pipeline and is pumped over a levy embankment into the Thermalito Afterbay. Other than the sumps there is no detention basin prior to discharge. The pipeline outfall is located approximately 10 feet beneath the surface of the Thermalito Afterbay, approximately 20 feet from shore (Discharge Point 001). The facilities are shown on Attachment B, which is incorporated herein and made part of this Order.
9. Potable water is received from a domestic well on-site. Domestic wastewater is retained in a 6,000 gallon holding tank which is pumped out every four to six weeks by a commercial sewage hauler.
10. The Facility has one 1,000-gallon split aboveground petroleum storage tank (AST) for diesel and gasoline fuel. The tank is stand mounted over a concrete pad with secondary containment. The diesel fuel is used for a back-up generator, and the gasoline is used for trucks and a mechanical feeder. No vehicle maintenance is performed on-site.
11. Wastes generated at the Facility include fish fecal material, unconsumed fish food, nutrients, algae, silt, chemicals and therapeutic agents used to treat fish and control disease.

12. Aquaculture drugs and chemicals are used at the Facility to treat fish directly for parasites, fungi, and bacteria, as well as to clean rearing raceways in order to reduce the spread of disease among the confined fish population. Chemicals currently used at the Facility include copper sulfate, acetic acid, potassium permanganate and sodium chloride (salt).
13. Chemicals that are not currently used at the Facility, but may possibly be used in the future include hydrogen peroxide, formalin (as a 37% formaldehyde, methanol-free solution) and Chloramine-T. Antibiotics such as Oxytetracycline (Terramycin<sup>®</sup>), Amoxicillin trihydrate, Romet-30<sup>®</sup> (Sulfadimethoxine-ormetoprim), erythromycin, and Florfenicol may be used in feed additives during periods of disease outbreak. Penicillin G, an antibiotic, may also be used as an immersive bath treatment during periods of disease outbreak at the Facility. MS-222, carbon dioxide, or AQUI-S<sup>®</sup> may be used to anesthetize fish during the annual fish tagging process. Vaccines, such as Vibrio vaccine and enteric redmouth bacertin may also be used. PVP Iodine solution is not used as no fish eggs are incubated or treated at the Facility.
14. There are no settling basins except for the two sumps at the end of the raceways, and wastewater is discharged directly to the Thermalito Afterbay via a discharge pipeline. Thus, there is little or no detention time and discharge of chemicals used in the facility is approximately equal to the treatment time. Obtaining a representative sample of the Facility's effluent has historically been difficult, as the two raceway sumps discharge through two separate pumps into the common discharge line. Prior to 1997, Discharger self-monitoring reports, as well as Regional Board staff sampling, had documented the discharge of wastewater from the Facility with settleable matter in excess of 0.1 ml/L as a 30-day average. In order to reduce settleable matter concentrations, the Discharger implemented multiple operational changes in 1997, including reducing the frequency of raceway cleaning and changing the type of fish food used at the Facility from a moist food pellet to dry food pellets. The number of raceways scrubbed and cleaned per day has been reduced from four to two. In addition, the sump basins are now emptied and cleaned out at the end of each rearing season, and sump basin sludge deposits are removed and disposed of off-site. The Discharger also installed a sampling port on the discharge pipe to attain a better representative sample of the combined effluent being discharged to the Thermalito Afterbay. No effluent limitation violations have been reported for settleable or suspended matter since October 1997.
15. The Discharger performed a tracer dye study using rhodamine dye to determine the direction of the Facility's effluent movement in the Thermalito Afterbay, and to determine new locations for upstream and downstream receiving water sampling locations. The purpose of the dye study was to establish typical flow patterns from the end of the effluent discharge pipe, as well as flow directions in the Thermalito Afterbay. Based on the results of the tracer dye study submitted by the Discharge on 26 January 2000, Regional Board staff revised the locations of the receiving water monitoring stations as shown on Attachment B.

### **APPLICABLE REGULATIONS, POLICIES, AND PLANS**

16. A cold-water concentrated aquatic animal production (CAAP) facility is defined in Title 40 of the Code of Federal Regulations (40 CFR 122.24) as a fish hatchery, fish farm, or other facility which contains, grows, or holds cold water fish species or other cold water aquatic animals including, but not limited to, the Salmonidae family of fish (e.g. trout and salmon) in ponds, raceways, or other similar structures. In addition, the facility must discharge at least 30 calendar days per year, produce at least 20,000 pounds harvest weight (9,090 kilograms) of aquatic animals per year, and feed at least 5,000 pounds (2,272 kilograms) of food during the calendar month of maximum feeding. A facility that does not meet the above criteria may also be designated a cold-water CAAP facility upon a determination that the facility is a significant contributor of pollution to waters of the United States [40 CFR 122.24(c)]. Cold water, flow-through CAAP facilities are designed to allow the continuous flow of fresh water through tanks and raceways used to produce aquatic animals (typically cold-water fish species). Flows from CAAP facilities ultimately are discharged to waters of the United States and of the State. 40 CFR 122.24 specifies that CAAP facilities are point sources subject to the National Pollutant Discharge Elimination System (NPDES) program. The Discharger's Facility meets the definition of a cold-water, flow-through CAAP.
17. The operation of CAAP facilities may introduce a variety of pollutants into receiving waters. U.S. Environmental Protection Agency (USEPA) identifies three classes of pollutants: (1) conventional pollutants (i.e., total suspended solids (TSS), oil and grease (O&G), biochemical oxygen demand (BOD), fecal coliforms, and pH); (2) toxic pollutants (e.g., metals such as copper, lead, nickel, and zinc and other toxic pollutants; and (3) non-conventional pollutants (e.g., ammonia-N, formalin, and phosphorus). Some of the most significant pollutants discharged from CAAP facilities are solids from uneaten feed and fish feces that settle to the bottom of the raceways. Both of these types of solids are primarily composed of organic matter including BOD, organic nitrogen, and organic phosphorus.
18. Fish raised in CAAP facilities may become vulnerable to disease and parasite infestations. Various aquaculture drugs and chemicals are used periodically at CAAP facilities to ensure the health and productivity of the confined fish population, as well as to maintain production efficiency. Aquaculture drugs and chemicals are used to clean raceways and to treat fish for parasites, fungal growths and bacterial infections. Aquaculture drugs and chemicals are also used to anesthetize fish prior to spawning or prior to the annual "tagging" process. As a result of these operations and practices, drugs and chemicals may be present in discharges to waters of the United States or waters of the State.

19. In August 2004, USEPA promulgated Effluent Limitation Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category (hereafter “ELG”). The ELG regulation establishes national technology-based effluent discharge requirements for flow-through and recirculating systems and for net pens based on Best Practicable Control Technology Currently Available (BPT); Best Control Technology for Conventional Pollutants (BCT); Best Available Technology Economically Achievable (BAT); and New Source Performance Standards (NSPS). In its proposed rule, published on 12 September 2002, USEPA proposed to establish numeric limitations for a single constituent – total suspended solids (TSS) – while controlling the discharge of other constituents through narrative requirements. In the final rule, however, USEPA determined that, for a nationally applicable regulation, it would be more appropriate to promulgate qualitative TSS limitations in the form of solids control best management practices (BMP) requirements. Furthermore, the final ELG does not include numeric effluent limitations for non-conventional and toxic constituents, such as aquaculture drugs and chemicals, but also relies on narrative limitations to address these constituents.
20. 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 describes an implementation program and policies to achieve water quality objectives for all waters of the Basin. This includes plans and policies adopted by the State Water Resources Control Board (SWRCB) and incorporated by reference, such as Resolution No. 68-16, “Statement of Policy with Respect to Maintaining High Quality of Waters in California” (Resolution No. 68-16). These requirements implement the Basin Plan. The Basin Plans, as amended, designate beneficial uses, establish water quality objectives, and contain implementation plans and policies for waters of the Basins. Pursuant to the California Water Code (CWC) Section 13263(a), waste discharge requirements must implement the Basin Plans.
21. 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.
22. Resolution No. 68-16 requires the Regional Board, in regulating discharges of waste, to maintain high quality waters of the State until it is demonstrated that any change in water quality will be consistent with the maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Board’s policies (e.g., water quality constituents in concentrations that exceed water quality objectives). Resolution No. 68-16 requires that discharges be

regulated to meet best practicable treatment or control in order to assure that pollution or nuisance will not occur; and the highest water quality be consistently maintained for the maximum benefit to the people of the State. The Board has considered Resolution No. 68-16 and Federal antidegradation regulations at 40 CFR 131.12 and 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.

### RECEIVING WATER BENEFICIAL USES

23. The beneficial uses of the Feather River downstream of the Fish Barrier Dam to the Sacramento River as identified in Table II-1 of the Basin Plan are municipal and domestic supply (MUN), agricultural supply irrigation (AGR), body contact water recreation (REC-1), canoeing and rafting (REC-1), other non-body contact water recreation (REC-2), warm and cold freshwater aquatic habitat (WARM and COLD), warm and cold fish migration (MGR), warm and cold spawning habitat (SPWN), and wildlife habitat (WILD).

The beneficial uses of the Thermalito Afterbay are not specifically identified in the Basin Plan, however the Plan states, "The beneficial uses of any specifically identified water body generally apply to its tributary streams." Upon review of the agricultural irrigation supply values, habitat values, and recreational uses of the Thermalito Afterbay, the Regional Board has determined that the beneficial uses identified in the Basin Plan for the Feather River are applicable to the Thermalito Afterbay.

- a. *Municipal and Domestic Supply (MUN)*: The Regional Board is required to apply the beneficial uses of municipal and domestic supply to the Thermalito Afterbay based on State Board Resolution No. 88-63 which was incorporated in the Basin Plan pursuant to Regional Board Resolution No. 89-056. In addition, the State Water Resources Control Board (SWRCB) has issued water rights to existing water users along the Thermalito Afterbay, and along the Feather River downstream of the Thermalito Outlet for domestic and agricultural irrigation uses. The Thermalito Afterbay percolates to groundwater, and is thus a source of drinking water. In addition to the existing water uses, growth in the area downstream of the Thermalito Outlet is expected to continue, which presents a potential for increased domestic and agricultural uses of the water in the Thermalito Afterbay.
- b. *Agricultural Irrigation (AGR)*: The Thermalito Afterbay is used to furnish water to local agricultural irrigation districts in the Oroville area, including Western Canal Irrigation District and the Sutter Butte Irrigation District. These local water supply diversions take water directly from the Thermalito Afterbay at the Western Canal and Richdale Outlet and the Sutter Butte Canal Outlet. According to DWR, the total capacity of Afterbay diversions during periods of peak water supply demands is 4,050 cfs. A May 1969 agreement between DWR and the Joint Water Districts

obligates DWR to provide water at temperatures reasonably related to achieving agricultural production within the Joint Water District service area. Local rice farmers, whose interests are represented under the 1969 agreement, need warmer water during spring and summer for germination and growth of the rice (i.e., 65°F from approximately April through mid-May, and 59°F during the remainder of the growing season). DWR accommodates these farmers by releasing water that is as close as possible to the maximum temperature allowable under the DFG-DWR agreement (i.e., 4°F higher than the objectives stated above).

- c. *Body Contact Water Recreation and Canoeing and Rafting (REC-1), and Non-Body Contact Recreation (REC-2)*: The Thermalito Afterbay offers 17 miles of shoreline and 4,300 surface acres of water, and provides multiple opportunities for boating, water skiing and swimming at numerous public recreation sites located around the shoreline. Non-body contact recreational opportunities around the Afterbay include fishing, picnicking, mountain biking, a shooting range and limited hunting. The Wilbur Road Recreation Area includes a fishing area and a boat launch. The Monument Hill recreation area, located on the east side of the Afterbay, includes facilities for boating, fishing and picnicking. According to DWR, the Monument Hill recreation area is the most heavily used recreation area along the shores of the Afterbay, with over 32,000 visitor days per year. The boating and fishing facilities at the Larkin Road recreation area generate nearly 29,000 visitor days per year (DWR 2001).
- d. *Warm and Cold freshwater aquatic habitat (WARM and COLD)*: According to DWR, the diverse temperature structure of the Afterbay provides suitable habitat for both coldwater and warmwater fish. A popular largemouth bass fishery currently exists, and large trout are sometimes caught near the inlet to the Afterbay. No salmonid stocking currently occurs at the Afterbay; however, these fish may pass into the Afterbay through the Thermalito Pumping-Generating Plant from the Thermalito Forebay. Although limited fish sampling has been conducted by DFG and DWR in the Afterbay, smallmouth bass, rainbow trout, brown trout, bluegill, black crappie, channel catfish, and carp have all been observed. In addition, most of the Lake Oroville sportfish also occur in the Afterbay to some degree.
- e. *Warm and Cold fish migration (MGR) and spawning habitat (SPWN)*: Minimum flows in the Lower Feather River are established by a 1983 agreement between DWR and DFG, concerning the Operation of the Oroville Division of the State Water Project for Management of Fish & Wildlife. The agreement establishes criteria for flow and temperature for the Low Flow Channel of the Feather River and the reach of the Feather River below the Thermalito Afterbay Outlet for the preservation of salmon migration, spawning and rearing habitat. This agreement specifies that DWR release a minimum of 600 cfs into the Feather River from the

Thermalito Diversion Dam for fishery purposes. Below the Afterbay Outlet, temperatures must be suitable for fall-run salmon during fall months (after September 15th). From May through August, temperatures must be suitable for shad, striped bass, and other warmwater fish.

- f. *Wildlife Habitat (WILD)*: The Oroville Wildlife Area (OWA) is located adjacent to the Feather River at the Thermalito Afterbay Outlet. The OWA provides multiple opportunities for fishing, swimming, hunting, nature study and ORV use. The OWA teems with wildlife, including many species of fish and birds. It contains over 75 warmwater ponds and sloughs, along with a vast complex of emergent marsh and flooded cottonwood, willow and sycamore trees. Largemouth bass, channel catfish, bluegill, green sunfish, and carp are highly abundant, along with populations of black and white crappie as well. In addition, portions of the OWA are managed by DFG to provide habitat for nesting and wintering waterfowl. Approximately two percent of the recreational use of this wildlife area is related to waterfowl hunting. The Thermalito Afterbay/Forebay Complex provides resting and foraging habitat for open water and diving waterfowl species (ruddy duck, bufflehead, scaup, ring-necked duck, common goldeneye, and common merganser) that is lacking in the surrounding agricultural areas. Bird-watchers can look for 178 species of birds, including heron and egret rookeries from February to June. The OWA provides fishing access to the majority of the upper reaches of the main stem Feather River; which is the most popular area for steelhead and salmon fishing on the river. The Thermalito Afterbay Outlet, located within the OWA, is the most popular fishing spot in Butte County, hosting tens of thousands of anglers each year.
24. Beneficial uses of the underlying groundwater are municipal and domestic supply (MUN), industrial service supply (IND), industrial process supply (PRO) and agricultural supply irrigation (AGR).

#### **EFFLUENT LIMITATIONS AND OTHER SPECIFICATIONS**

25. Federal regulations at 40 CFR 122.44 require NPDES permits to contain effluent limitations, including technology-based and water quality-based limitations for specific constituents and limitations based on toxicity.

#### **TECHNOLOGY-BASED EFFLUENT LIMITATIONS**

26. The Facility creates wastes, including solids from algae, silt, fish feces, and uneaten feed. As noted above, USEPA's final ELG for the aquaculture industry does not include numeric effluent limitations on any conventional, non-conventional, or toxic constituents. Rather, USEPA promulgated qualitative limitations in the form of BMP requirements. The Regional Board is establishing effluent limitations for discharges of total suspended



solids (TSS) and settleable solids from this Facility. Technology-based requirements in this Order are based on a combination of application of the ELG for BMP requirements and case-by-case numeric limitations developed using best professional judgment (BPJ) and carried over from the previous Order No. 94-092. Section 402(o) of the CWA prohibits backsliding of effluent limitations that are based on BPJ to reflect a subsequently promulgated ELG which is less stringent. Order No. 94-092 established effluent limitations for TSS of 5.0 mg/L net TSS as an average monthly limitation and 15 mg/L net TSS as a maximum daily limitation. In addition, Order No. 94-092 established effluent limitations for settleable solids of 0.1 mL/L as an average monthly limitation and 0.2 mL/L as a maximum daily limitation. Removal of these numeric limitations for TSS and settleable solids would constitute backsliding under CWA Section 402(o). The Regional Board has determined that these numeric effluent limitations for TSS and settleable solids continue to be applicable to the Facility and that backsliding is not appropriate. These limitations are established as a means of controlling the discharge of solids from algae, silt, fish feces and uneaten food. This Order does not include mass effluent limitations for TSS because there are no standards that specifically require a mass-based effluent limitation, mass of the pollutant discharged is not specifically related to a measure of operation (40 CFR 122.45(f)(iii)), and, in addition, mass-based effluent limitations for TSS are not necessary because this Order includes both concentration-based limitations and a maximum flow limitation. These changes are consistent with Federal anti-backsliding provisions of 40 CFR 122.44(l)(1) and 122.62(a)(2).

### ***WATER QUALITY-BASED EFFLUENT LIMITATIONS***

27. Federal regulations at 40 CFR 122.44(d)(1) require effluent limitations for all pollutants that are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an in-stream excursion above a numeric water quality criterion (such as a CTR criterion) or a narrative water quality criterion within a State water quality standard. These regulations also set forth a methodology for establishing effluent limitations based on narrative state water quality criteria [40 CFR 122.44(d)(1)(vi)(A-C)].
28. The USEPA, SWRCB, and Regional Board have adopted or published standards that are used to implement 40 CFR 122.44. The USEPA has promulgated the CTR and NTR that established water quality criteria. The SWRCB has adopted the SIP that implements the CTR and NTR. The USEPA also has published recommended ambient water quality criteria and the Basin Plan contains numeric and narrative water quality objectives. The Basin Plan contains an Implementation Policy (“Policy for Application of Water Quality Objectives”) that, in part, sets forth a process for translating narrative water quality objectives into numeric effluent limitations. The USEPA ambient water quality criteria, results of toxicity studies conducted by the California Department of Fish and Game, and the Basin Plan “Policy of Application of Water Quality Objectives” have been used to implement 40 CFR 122.44(d)(1)(v).

29. On 11 December 2000, the Discharger was issued a letter under the authority of California Water Code Section 13267 requesting effluent and receiving water monitoring to perform a reasonable potential analysis. The Discharger collected effluent and receiving water samples on 11 February 2003, to determine if the priority pollutants established in the CTR and NTR were detected. Analytical results were submitted for volatile substances, semi-volatile substances, metals, asbestos, 2,3,7,8-TCDD dioxin, and sixteen other dioxin congeners. None of the priority pollutants were detected at concentrations that would cause or contribute to an in-stream excursion above a water quality objective. The effluent sample for priority pollutant metals was collected at a time when the Discharger was not using copper sulfate for disease control. Based on additional analyses conducted during the use of copper sulfate the Regional Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above the CTR objective for copper during these short-term treatments. Effluent limitations for copper are included in this Order.
30. Based information submitted as part of the Report of Waste Discharge, in annual and monthly monitoring reports, in studies performed by and correspondence with DFG, and in independent studies, the Regional Board finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above numeric or narrative water quality objectives for copper, pH, and formaldehyde. Effluent limitations for these constituents are included in this Order. The Regional Board is not obligated to delegate the assimilative capacity of receiving waters to a Discharger. Therefore, the Regional Board establishes water quality-based effluent limitations without benefit of dilution in this Order. Water quality-based effluent limitations are based on the application of water quality criteria or objectives at the point of discharge.

### ***CTR EFFLUENT LIMITATIONS***

31. Copper sulfate is currently used at the Facility to clean raceways in order to control algae and to reduce the growth of external parasites and bacteria on fish. Copper sulfate is typically used when daily salt flushing is not effective in controlling disease or bacteria in the rearing raceways. Up to 24 oz. (680 grams) of copper sulfate crystals are used per raceway cleaning, with one raceway cleaned at a time. Copper sulfate crystals are pre-mixed with water and acetic acid (to dissolve the copper), and the solution is added to the raceway headworks. The Discharger estimates there is an estimated 2-hour flush of copper sulfate through a raceway. At the minimum flow of 3.35 mgd through the Facility, and with the maximum use of copper sulfate of 24 oz. (1.5 lbs) per raceway cleaning, the maximum calculated concentration of copper in a 2-hour flush to the Thermalito Afterbay is 640 ug/L. At the maximum flow of 7.8 mgd with 1.5 lbs of copper, the calculated concentration in a 2-hour flush to the Thermalito Afterbay is 277 ug/L.
32. Copper is identified as a priority pollutant in the NTR and CTR. The CTR includes the Ambient Water Quality Criteria for the Protection of Aquatic Life for copper. The Criterion

- Maximum Concentration (CMC), a 1-hour average, and Criterion Continuous Concentration (CCC), a 4-day average, are hardness dependent. The criteria are expressed in terms of the dissolved fraction of the metal in the water column and are calculated from the total recoverable values by applying a conversion factor. Since a site-specific conversion factor has not been developed for copper as described in the SIP Section 1.4.1, the USEPA conversion factor for copper of 0.960 was used for translating the dissolved copper criterion into a total recoverable effluent concentration allowance (ECA) with no dilution.
33. Effluent limits established using the procedures outlined in the SIP result in Average Monthly Effluent Limits (AMEL) and Maximum Daily Effluent Limits (MDEL). Since copper is added for short-term treatments (2-hour flush) and the Facility is a flow-through facility with only four raceways without on-line settling, copper is expected to be present in the discharge for approximately the same duration as treatment, typically 8-hours or less. Therefore, the Regional Board is establishing a MDEL for copper in this Permit based on the acute criterion (CMC) adjusted for receiving water hardness as described in the Information Sheet and as shown in Attachment C. The Regional Board determined that an AMEL is not appropriate based on the current treatment practice and water flow characteristics through the Facility. Measurements of hardness in the Thermalito Afterbay have ranged between 23 and 58 mg/L. As shown in Attachment C, at a minimum hardness of 23 mg/L in the receiving water, the MDEL expressed as total recoverable copper is 3.5 ug/L and at the maximum hardness of 58 mg/L the MDEL is 8.4 ug/L.
34. Actual copper concentrations measured during treatment vary with the flow and depend on when the sample was taken during the treatment. The Discharger conducted monitoring in 2002 and 2003, taking grab samples during copper treatments. During some treatments samples were collected at half hour intervals. The maximum reported concentration in the discharge to the Thermalito Afterbay for the treatment of one raceway was 285 ug/L during the copper treatments. Based on the calculated concentration as well as the actual measurements during treatments, the copper concentration in the effluent exceeds the MDEL. The Discharger has requested a compliance time schedule to reduce or eliminate the use of copper and to develop substitute treatments.
35. 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 maximum daily effluent limitation for copper is a new requirement in this Order, the Discharger requested a compliance time schedule be granted to allow time to develop alternative treatments. The Discharger indicated that until a substitute treatment is developed there would be a significant loss of fish as a result of parasite and bacterial infestations without the use of copper treatments. The Discharger has quantified the use of copper and determined minimum concentrations necessary to control the parasite and bacterial infestations and is actively

pursuing the development of alternate treatments. The Discharger has also implemented changes in the treatment practices to minimize the concentration of copper in the discharge, such as treating only one raceway at a time. Therefore, considering these efforts and the time necessary to develop substitute treatments, this Order includes a compliance time schedule for compliance with the final effluent limits or elimination of copper treatments of five years. The final effluent limitations for copper become effective on **1 September 2009**. As this schedule is greater than one year, the Discharger shall submit annual progress reports on **1 July** each year until the Discharger achieves compliance with the final water quality based effluent limitations for copper or eliminates the use of copper.

36. The SIP, Section 2.2.1, requires that if a compliance schedule is granted for a CTR or NTR constituent, the Regional Board shall establish interim limitations and dates for their achievement in the NPDES permit. In accordance with the SIP, a numeric interim effluent limitation for copper has been established in this Order based upon the current treatment practice of treating one raceway at a time. In developing the interim limitation, where there are ten sampling data points or more, sampling and laboratory variability is accounted for by establishing interim limits that are based on normally distributed data where 99.9% of the data points will lie within 3.3 standard deviations of the mean. Where actual sampling shows an exceedance of the proposed 3.3-standard deviation interim limit, the maximum detected concentration is established as the interim limitation. As shown in the Information Sheet, the interim limitation in this Order has been calculated as the sample mean plus 3.3 times the standard deviation based on the monitoring data from 28 samples supplied by the Discharger for treatment of one raceway at a time. This Order contains an interim maximum daily effluent limitation of 306 ug/L.

#### ***NON-CTR EFFLUENT LIMITATIONS***

37. The Basin Plan contains water quality objectives for pH in the form of a range of acceptable pH values (measured in standard units). The Regional Board determined that the discharge from this Facility may cause, have the reasonable potential to cause, or contribute to an in-stream excursion of the numeric water quality objective for pH from the Basin Plan. Accordingly, the Regional Board established effluent limitations in the form of acceptable ranges of pH between 6.5 to 8.5 for discharges to the Thermalito Afterbay.
38. Numeric water quality criteria, or Basin Plan numeric objectives are currently not available for most of the aquaculture drugs and chemicals used by the Discharger or proposed for use at this facility. Therefore, the Regional Board used the narrative water quality objective for toxicity from the Basin Plans and applied the Policy for "Application of Water Quality Objectives" as a basis for determining "reasonable potential" for discharges of these drugs and chemicals. This objective states, in part: "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." The Basin Plan states that compliance with this objective will

be determined by several factors, including biotoxicity tests of appropriate duration, or other analytical methods as specified by the Regional Board. (Biotoxicity testing involves measuring the toxic effects of an effluent on specified organisms according to nationally approved protocols). USEPA's *Technical Support Document for Water Quality-based Toxics Control* (TSD) specifies two toxicity measurement techniques that can be employed in effluent characterization; the first is Whole Effluent Toxicity (WET) testing, and the second is chemical-specific toxicity analyses. WET testing is used most appropriately when the toxic constituents in an effluent are not completely known; whereas chemical-specific analysis is more appropriately used when an effluent contains only one, or very few, well-known constituents. Due to the nature of operations and chemical treatments at most CAAP facilities in the Region, CAAP facility effluents generally contain only one or two known chemicals at any given a time. Therefore, the Regional Board is using a chemical-specific approach to determine "reasonable potential" for discharges of aquaculture drugs and chemicals from CAAP facilities. The California Department of Fish and Game Pesticide Investigation Unit (DFG Pesticide Unit) has initiated biotoxicity studies to determine the aquatic toxicity of certain aquaculture drugs and chemicals commonly used at their CAAP facilities in the Region.

39. Sodium chloride (salt) is used regularly at the Facility as a fish-cleansing agent to control the spread of fish disease in the raceways, and to reduce stress amongst the confined fish population. The Discharger reports using up to 400 lbs of salt per raceway treatment, with an estimated 2-hour elimination period from the raceway. Based on the minimum discharge flow through the Facility of 3.35 mgd (5.2 cfs), the maximum concentration of salt in a 2-hour discharge to the Thermalito Afterbay from one raceway is calculated to be 170.8 (mg/L). FDA considers sodium chloride an unapproved new animal drug of low regulatory priority (LRP drug) for use in aquaculture. Consequently, FDA is unlikely to take regulatory action if an appropriate grade is used, good management practices are followed, and local environmental requirements are met. The Regional Board has determined that the discharge of chloride from the Facility from sodium chloride application rates as described by the Discharger will not cause, have the reasonable potential to cause, or contribute to an in-stream excursion of applicable water quality criteria or objectives. To assure compliance with the receiving water objective for specific conductance of 150  $\mu$ mhos/cm (90<sup>th</sup> percentile) applicable to the Feather River, and tributaries to the Feather River, this permit requires monitoring of conductivity and chloride in the Thermalito Afterbay when salt is used to clean raceways at the Facility. If monitoring indicates the discharge causes the receiving water objective to be exceeded, this permit may be reopened to establish an effluent limitation.
40. Formalin (as a 37% formaldehyde solution) is not currently used but may be used by the Discharger at the Facility. Formalin is approved through FDA's New Animal Drug Application (NADA) program for use in controlling external protozoa and monogenetic trematodes on fish, and for controlling fungi of the family *Saprolegniaceae* in food-producing

aquatic species (including trout and salmon). For control of other fungi, formalin may be used under an Investigational New Animal Drug (INAD) exemption. Formalin is used as a “drip” treatment to control fungus on fish eggs, or as a “flush” treatment in raceways of 1-8 hours in duration. Formalin may be applied in multiple treatments over the course of a given month, or may be applied in raceways for up to 8 hours at a time.

The Basin Plan contains a narrative water quality objective for toxicity that states in part that “[a]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life” (narrative toxicity objective). The DFG Pesticide Unit conducted biotoxicity studies to determine the aquatic toxicity of formaldehyde using *Pimephales promelas*, and *Ceriodaphnia dubia* (*C. dubia*) in accordance with the analytical methods specified in EPA600/4-91-002, *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*. These “short-term chronic tests” measure effects such as reduced growth of the organism, reduced reproduction rates, or lethality. Results were reported as a No Observed Effect Concentration (NOEC) and a Lowest Observed Effect Concentration (LOEC). The DFG Pesticide Unit also conducted acute toxicity tests using *C. dubia* in accordance with methods specified in EPA600/4-90/027, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*. Acute toxicity test results typically are reported as the No Observed Adverse Effect Level (NOAEL), Lowest Observed Adverse Effect Level (LOAEL), and LC<sub>50</sub>. The Regional Board considered the results of both acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for formalin as formaldehyde were necessary.

Results of chronic toxicity tests indicated *C. dubia* was the most sensitive species, with a 7-day NOEC value of 1.3 mg/L formaldehyde for survival and less than 1.3 mg/L for reproduction. Acute toxicity tests conducted using *C. dubia* showed a 96-hour NOAEL of 1.3 mg/L formaldehyde. Additional acute toxicity tests were conducted using an 8-hour exposure resulting in a 96-hour NOAEL concentration of 6.7 mg/L formaldehyde. Based on typical application rates for Formalin, the Regional Board determined that if formalin is used at this Facility in the future, formaldehyde may be discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plan. Accordingly, this permit includes water quality-based effluent limitations for formaldehyde. Because the Facility is a flow-through facility without on-line settling, formaldehyde is expected to be present in the discharge for approximately the same duration as treatment, typically 8-hours or less. Therefore, the Regional Board is establishing a maximum daily effluent limitation of 6.7 mg/L with the requirement that the Facility monitor for formaldehyde at least once per month during formalin treatment. This limit is based on the observed 96-hour NOAEL with 8-hour exposure to formaldehyde. In addition, the Regional Board is establishing an average monthly effluent limitation of 0.65 mg/L formaldehyde based on the 96-hour NOAEL with

96-hours of exposure calculated using procedures from USEPA's TSD. This limit will ensure protection of aquatic life from longer-term exposure to formaldehyde through successive treatments with formalin. The previous Order for the Facility included a less stringent daily maximum limitation of 0.03 mg/L. There is no information in the previous Order or fact sheet to support the 0.03 mg/L limit and Regional Board staff have not found information supporting the limit. Based on the above new information for short term toxicity for an 8-hour exposure, which was not available at the time of issuance of the previous Order, and inclusion of the average monthly effluent limitation of 0.65 mg/L, establishment of a less stringent daily maximum effluent limitation is appropriate. The formaldehyde limitations established in this permit are consistent with federal and State antidegradation and antibacksliding requirements.

41. Acetic acid is used to dissolve the copper sulfate during the treatment of the raceways. The influent water at the Facility has a high mineral content, and is relatively hard (70 mg/L as CaCO<sub>3</sub>), therefore the copper sulfate crystals do not dissolve well in the raceways. The Discharger reports using a ratio of two-thirds acetic acid to the total amount of copper sulfate crystals used. Acetic acid may also potentially be used by the Discharger as a "flush" treatment in raceways for the control of external parasites on fish. The Basin Plan contains water quality objectives for pH in the form of a range of acceptable pH values (measured in standard units). Since acetic acid will lower the pH of the water the Regional Board has included an effluent limit for pH. Monthly use of acetic acid must be reported as specified in the attached Monitoring and Reporting Program.
42. Hydrogen peroxide (35 % H<sub>2</sub>O<sub>2</sub>) is not currently used but may be used by the Discharger in the future as a short-term immersion bath treatment in holding tanks, or as a raceway flush treatment. The Discharger reports that the 35% hydrogen peroxide solution would be used as a one-hour treatment of 100 mg/L in only one raceway at a time. FDA considers hydrogen peroxide to be an LRP drug when used to control fungi on fish at all life stages, including eggs. Hydrogen peroxide may also be used under an INAD exemption to control bacterial gill disease in various fish, fungal infections, external bacterial infections, and external parasites. Hydrogen peroxide is a strong oxidizer that breaks down into water and oxygen; however, it exhibits toxicity to aquatic life during the oxidation process. Based only on the minimum dilution through the facility of 3.35 mgd and a 1-hour treatment at 100 mg/L in one raceway at a time, the estimated maximum concentration of hydrogen peroxide in the discharge would be 16.6 mg/L. This concentration, however, does not account for any breakdown of hydrogen peroxide within the Facility. The Regional Board considered the results of acute aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for hydrogen peroxide were necessary in this Permit. Results of a single acute toxicity test using *C. dubia* showed a 96-hour NOAEL of 1.3 mg/L. There is no toxicity information available for shorter exposure periods. Exposure to hydrogen peroxide may be short-term because the facility only has four raceways and no settling basins that could increase exposure times. The DFG

Pesticide Unit is proposing to conduct additional toxicity testing on hydrogen peroxide to determine NOAEL concentrations for shorter exposure periods. Since there is limited short- and long-term toxicity information available at this time and no information regarding actual discharge concentrations of hydrogen peroxide, this permit does not include water quality-based effluent limitations for hydrogen peroxide. However, use and monitoring of hydrogen peroxide must be reported as specified in the attached Monitoring and Reporting Program and results of additional toxicity tests must be submitted as specified in Provision No. 5. The Regional Board will review this information, and other information as it becomes available and this permit may be reopened to establish effluent limits based on additional use and toxicity information.

43. Potassium permanganate is rarely used at the Facility. However, on occasion it is necessary to use Potassium Permanganate to control gill disease as a 2-hour flush treatment in the raceways. A total of 54 oz were used in March and April of 2001, during an outbreak of Infectious Hematopoietic Necrosis at the Facility. Potassium permanganate has a low estimated lifetime in the environment, being readily converted by oxidizable materials to insoluble manganese dioxide ( $MnO_2$ ). In non-reducing and non-acidic environments,  $MnO_2$  is insoluble and has a very low bioaccumulative potential. Based only on the minimum dilution through the facility of 3.35 mgd and a 2-hour flush treatment using 20 ounces in one raceway at a time, the estimated maximum concentration of potassium permanganate in the discharge would be 0.53 mg/L. This concentration, however, does not account for any breakdown of potassium permanganate within the Facility.

Because potassium permanganate is typically applied in a single, short-term treatment, or as a series of closely-spaced, short-term treatments, the Regional Board considered the results of acute aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for potassium permanganate were necessary in this Permit. Results of a single acute toxicity test using *C. dubia* showed a 96-hour NOAEL of 0.25 mg/L for potassium permanganate. Exposure to potassium permanganate would be short-term because the facility only has four raceways and no settling basins that could increase exposure times. There is no toxicity information available for shorter exposure periods. The DFG Pesticide Unit is proposing to conduct additional toxicity testing on potassium permanganate to determine NOAEL concentrations for shorter exposure periods. Since there is limited toxicity information available for short- and long-term exposure and no information regarding actual discharge concentrations of potassium permanganate, this permit does not include water quality-based effluent limitations for potassium permanganate. However, use and monitoring of potassium permanganate must be reported as specified in the attached Monitoring and Reporting Program and results of additional toxicity tests must be submitted as specified in Provision No. 5. The Regional Board will review this information, and other information as it becomes available and this permit may be reopened to establish effluent limits based on additional use and toxicity information.



44. Chloramine-T is not currently used but may be used by the Discharger in the future as a possible replacement of copper and formalin. Chloramine-T is available for use in accordance with an INAD exemption by FDA. The Discharger reports that the therapeutic treatment consists of a 10-20 mg/L dose for a 3-hour exposure. Chloramine-T breaks down into para-toluenesulfonamide (p-TSA) and unlike other chlorine based disinfectants does not form harmful chlorinated compounds. The Discharger has not conducted biotoxicity tests using Chloramine-T, however results of toxicity testing from other sources were submitted and showed a 96-hour LC<sub>50</sub> for rainbow trout of 2.8 mg/L. The 48-hour NOEC for *Daphnia magna* was reported as 1.8 mg/L. Exposure to Chloramine-T would be short-term because the facility only has four raceways and no settling basins that could increase discharge and exposure times. There is no toxicity information available for shorter exposure periods. The DFG Pesticide Unit is proposing to conduct additional toxicity testing on Chloramine-T to determine NOAEL concentrations for shorter exposure periods. Since there is limited toxicity information available for short- and long-term exposure and no information regarding actual discharge concentrations of Chloramine-T, this permit does not include water quality-based effluent limitations for Chloramine-T. However, use and monitoring of Chloramine-T must be reported as specified in the attached Monitoring and Reporting Program and results of additional toxicity tests must be submitted as specified in Provision No.5. The Regional Board will review this information, and other information as it becomes available and this permit may be reopened to establish effluent limits based on additional use and toxicity information.
45. PVP Iodine (also known by the brand name Iodophor) is used in short-term “flush” treatments as a fish egg disinfectant up to 30 minutes in duration. PVP Iodine solution is not currently used at the Facility, as no fish eggs are incubated or treated at the Facility. The Discharger does not propose use of PVP Iodine solution at the Facility in the future.
46. Oxytetracycline is not currently used but may potentially be used by the Discharger. Oxytetracycline, also known by the brand name Terramycin<sup>®</sup>, is an antibiotic approved through FDA’s NADA program for use in controlling ulcer disease, furunculosis, bacterial hemorrhagic septicemia, and pseudomonas disease in salmonids. Oxytetracycline is most commonly used at CAAP facilities as a feed additive. However, oxytetracycline may also be used as an extra-label use under a veterinarian’s prescription in an immersion bath of approximately six to eight hours in duration. Because oxytetracycline may be applied in an immersion bath for up to eight hours at a time, the Regional Board considered the results of acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for oxytetracycline used in an immersion bath treatment were necessary in this Permit. Results of acute toxicity tests using *C. dubia* showed a 96-hour NOAEL of 40.4 mg/L. Results of chronic toxicity tests using *C. dubia* showed a 7-day NOEC for reproduction of 48 mg/L. The information available to the Regional Board regarding discharges of oxytetracycline indicates that it may be discharged at similar facilities in the Region at levels up to a maximum concentration of

0.05 mg/L, well below the lowest NOEC and NOAEL. Therefore, at this time, the Regional Board determined that oxytetracycline, when used in feed or in an immersion bath treatment, is not discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plans. Accordingly, this Permit does not include an effluent limitation for oxytetracycline. However, monthly use of oxytetracycline must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this permit may be reopened to establish effluent limits based on additional use and toxicity information.

47. Penicillin G is not currently used, but may potentially be used by the Discharger. Penicillin G, also known as Pen-G, is an antibiotic used in a six to eight hour immersion bath treatment to control acute disease outbreaks. Penicillin G is not approved under FDA's NADA program and its' extra-label use in aquaculture requires a veterinarian's prescription. Due to the length of treatment time (up to eight hours), the Regional Board considered the results of acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for Penicillin G were necessary in this Permit. Results of acute toxicity tests using *C. dubia* showed a 96-hour NOAEL of 890 mg/L. Results of 7-day chronic toxicity testing using *Pimephales promelas* showed 7-day NOEC for survival of 350 mg/L. The information available to the Regional Board regarding discharges of Penicillin G indicates that it is discharged at levels well below the lowest NOEC and NOAEL. The Regional Board has determined that the discharge of Penicillin G as described by the Discharger will not cause, have the reasonable potential to cause, or contribute to an in-stream excursion of applicable water quality criteria or objectives. Accordingly, this Permit does not include effluent limitations for Penicillin G. However, monthly use of Penicillin G must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this permit may be reopened to establish effluent limits based on additional use and toxicity information.
48. Amoxicillin, erythromycin, florfenicol, and Romet-30<sup>®</sup> are not currently used but may potentially be used by the Discharger. Amoxicillin is injected into fish to control acute disease outbreaks through a veterinarian's prescription for extra-label use. Erythromycin (injected or used in feed formulations) and florfenicol (used in feed formulations) are antibiotics used to control acute disease outbreaks and must be used under an INAD exemption or a veterinarian's prescription for extra-label use. Romet-30<sup>®</sup>, also known by the trade name Sulfadimethoxine-oremtroprim, is an antibiotic used in feed formulations and is approved for use in aquaculture through FDA's NADA program for control of furunculosis in salmonids. In the NPDES General Permit for Aquaculture Facilities in Idaho (Idaho General Permit), USEPA Region 10 distinguishes between antibiotics applied in feed formulations and antibiotics applied in immersion baths. The Idaho General Permit concludes that drugs or chemicals administered via feed, and ingested by fish, pose little threat to aquatic life or

beneficial uses because a majority of the drug is utilized by the fish, though some literature suggests otherwise. As stated in the Idaho General Permit, "USEPA believes that disease control drugs and other chemicals provided for ingestion by fish do not pose a risk of harm or degradation to aquatic life or other beneficial uses." The Regional Board determined that amoxicillin (when injected into fish), erythromycin (when injected into fish or used as a feed additive), florfenicol and Romet-30<sup>®</sup> (when used as feed additives) are used in a manner that reduces the likelihood of direct discharge of antibiotics to waters of the United States or waters of the State, particularly when Dischargers implement BMPs as required by this Permit. Therefore, the Regional Board determined that amoxicillin, florfenicol and Romet 30<sup>®</sup> are not discharged from CAAP facilities in the Region at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plan. Accordingly, this Permit does not include water quality-based effluent limitations for these substances; however, this Permit does require monthly monitoring and reporting of these substances as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information and this permit may be reopened to establish effluent limits based on additional use and toxicity information.

49. Anesthetics are not currently used at the Facility. However, the Discharger may use an anesthetic known as Tricaine methansulfonate, commonly known as MS-222 (with trade names of Finquel<sup>®</sup> or Tricaine-S<sup>®</sup>), carbon dioxide, or Aqui-S<sup>®</sup>. The Regional Board does not have specific toxicity information for MS-222 or Aqui-S<sup>®</sup> or estimates of potential discharge concentrations of MS-222 and Aqui-S<sup>®</sup> at this Facility. The Discharger is not proposing to discharge these chemicals to waters of the United States or waters of the State, but plans to use other means of disposal. Consequently, this Order does not include water quality-based effluent limitations for these anesthetics, but use and means of disposal of these chemicals must be reported as specified in the attached Monitoring and Reporting Program. Also, this Order includes a provision requiring that all aquaculture drugs and chemicals not discharged to receiving waters be disposed of in an environmentally safe manner, according to label guidelines, Material Safety Data Sheet guidelines and BMPs. Any other form of disposal requires approval from the Executive Officer.
50. The Discharger has indicated that it may use a vibrio vaccine and an enteric redmouth bacertin in the future. Vibrio vaccine may be used as an immersion or an injectable vaccine and helps protect salmonid species from vibriosis disease caused by *Vibrio anguillarum* serotype I and *Vibrio ordalii*. Vibrio vaccine stimulates the fish's immune system to produce protective antibodies, helping the animal defend itself against vibriosis. Enteric redmouth (or yersiniosis) bacertins are formulated from inactivated *Yersinia ruckeri* bacteria and may also be used as an immersion or vaccine to help protect salmonid species from enteric redmouth disease caused by *Yersinia ruckeri*. These bacertins stimulate the fish's immune system to produce protective antibodies. These veterinary biologics are licensed for use by the U.S. Department of Agriculture's (USDA's) Center for Veterinary Biologics. Veterinarians should be consulted before beginning an immunization program. According to USDA, most

biologics leave no chemical residues in animals and most disease organisms do not develop resistance to the immune response by a veterinary biologic. Based upon available information regarding the use of these substances at CAAP facilities, the Regional Board does not believe that vibrio vaccine or enteric redmouth bacertins, when used according to label and veterinarian instructions, are discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of Basin Plan narrative water quality objectives for toxicity. Accordingly, this General Order does not include water quality-based effluent limitations for these substances; however, use of these substances must be reported as specified in the attached Monitoring and Reporting Program. In the future, as additional information becomes available regarding the use or toxicity of these biologics, the Regional Board will re-evaluate whether the discharge of any of these substances to receiving waters may cause, have the reasonable potential to cause, or contribute to an excursion of the Basin Plan objectives for toxicity and, if necessary, re-open this Order to include numeric effluent limitations.

#### OTHER CONSIDERATIONS

51. CWC Section 13267 states, in part, “(a) A Regional Board, in establishing...waste discharge requirements... may investigate the quality of any waters of the state within its region” and “(b) (1) In conducting an investigation... the Regional Board may require that any person who... discharges... waste...that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Board requires.” CWC Section 13383 states in part, “a regional board may establish monitoring, inspection, entry, reporting, and record keeping requirements . . . for any person who discharges pollutants . . . to navigable waters.” The attached Monitoring and Reporting Program No. R5-2004-0121 is necessary to assure compliance with waste discharge requirements and is incorporated by reference herein. The attached Monitoring and Reporting Program is established pursuant to CWC Sections 13267 and 13383.
52. 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.
53. Best Management Practices plan requirements are established based on requirements in Effluent Limitations Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category at 40 CFR Part 451.
54. The Regional Board has considered the information in the attached Information Sheet in developing the findings in this Order. The attached Information Sheet is part of this Order.

55. The action to adopt an NPDES permit is exempt from the provisions of the California Environmental Quality Act (CEQA), Public Resources Code Section 21100, et seq., in accordance with Section 13389 of the CWC.
56. 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.
57. The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge.
58. This Order shall serve as an NPDES permit pursuant to Section 402 of the CWA, and amendments thereto, and shall take effect upon the date of hearing, provided USEPA has no objections.

**IT IS HEREBY ORDERED** that Order No. 94-092 is rescinded and that the State of California, Department of Fish and Game and Department of Water Resources, their 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 wastes in a manner other than as described in this Permit, or at a location different from that described in Finding Nos. 4, 8 or 9 is prohibited, and may be considered a violation of the Clean Water Act and the CWC.
2. The by-pass or overflow of untreated wastewater or wastes into any surface water or surface water drainage course is prohibited, except as allowed by Standard Provision A.13.
3. Discharge of waste classified as “hazardous” as defined in §2521(a) of Title 23, California Code of Regulations (CCR), §2510, et seq., (hereafter Chapter 15), or “designated”, as defined in §13173 of the CWC, is prohibited.
4. Practices that allow accumulated sludge, grit, and solid residues to be discharged to surface waters or surface water drainage courses are prohibited.

**B. Effluent Limitations**

1. Effluent discharged into a surface water shall not have a pH less than 6.5 nor greater than 8.5 standard units.
2. The maximum daily discharge of flow through wastewater shall not exceed 7.8 mgd.
3. Direct discharges to surface waters shall not exceed the following limits:

<u>Constituent</u>	<u>Units</u>	<u>Average Monthly Limit</u>	<u>Maximum Daily Limit</u>
Suspended Solids <sup>1</sup> (net)	mg/L	5.0	15.0
Settleable Solids	ml/L	0.1	0.2
Formaldehyde	mg/L	0.65	6.7
Copper <sup>2</sup>	ug/L	<b>Calculate Limit based on Attachment C</b>	

<sup>1</sup> Effluent limitations for total suspended solids are net values (effluent minus influent).

<sup>2</sup> A daily maximum value for copper shall be considered non-compliant with the effluent limit only if it exceeds the effluent limitation and the reported minimum level (ML). The highest acceptable ML for calibration purposes is 0.5 µg/l.

4. An Interim effluent limit has been established for copper. The interim effluent limit is based on Section 2.2.1 of the SIP and was derived from recent performance during treatment of one raceway at a time with copper sulfate. Until the date final effluent limitations for copper become effective, the discharge of wastewater to the Thermalito Afterbay in excess of the following is prohibited

<u>Constituent</u>	<u>Unit</u>	<u>Maximum Daily Effluent Limit</u>
Copper (total recoverable)	ug/L	306

Final water quality based effluent limits for copper, as described in Attachment C of this Order, will become effective on **1 September 2009** if the Discharger complies with the tasks and reporting specified in Provision No. 7. The final effluent limits for copper

become effective immediately upon failure of the Discharger to comply with or submit the information requested by Provision No. 7.

**C. Discharge Specifications**

1. Neither the treatment nor the discharge shall cause a nuisance or pollution as defined by the CWC, Section 13050.
2. The discharge shall not cause degradation of any water supply.

**D. Best Management Practices (BMP) Plan**

**Within 12 months of adoption of this Order**, the Discharger shall certify in writing to the Regional Board that it has developed a Best Management Practices (BMP) plan. The Discharger shall develop and implement the BMP plan to prevent or minimize the generation and discharge of wastes and pollutants to the waters of the United States and waters of the State. The Discharger shall develop and implement a BMP plan consistent with the following objectives:

1. Solids Management
  - a. Conduct fish feeding in raceways in a manner that limits feed input to the minimum amount reasonably necessary to achieve production goals and sustain targeted rates of aquatic animal growth and minimizes the discharge of unconsumed food and waste products to surface waters.
  - b. Clean raceways using procedures and at frequencies that minimize the disturbance and subsequent discharge of accumulated solids during routine activities such as inventorying, grading, and harvesting.
  - c. Report the final disposition of all other solids and liquids, including aquaculture drugs and chemicals, not discharged to surface waters in the effluent.
  - d. Collect, store, and dispose of fish mortalities and other solids in an environmentally safe manner and in manner so as to minimize discharge to waters of the United States or waters of the State.
2. Operations and Maintenance
  - a. Maintain in-system production and wastewater treatment technologies to prevent the overflow of any floating matter or bypassing of treatment technologies.

- b. Inspect the production system and the wastewater treatment system on a routine basis in order to identify and promptly repair any damage.
  - c. Ensure storage and containment of drugs, chemicals, fuel, waste oil, or other materials to prevent spillage or release into the aquatic animal production facility, waters of the United States, or waters of the State.
  - d. Implement procedures for properly containing, cleaning, and disposing of any spilled material.
  - e. Prevent fish from being released within the FDA-required withdrawal time of any drug or chemical with which they have been treated.
3. Training
- a. Adequately train all relevant facility personnel in spill prevention and how to respond in the event of a spill in order to ensure the proper clean-up and disposal of spilled material.
  - b. Train staff on the proper operation and cleaning of production and wastewater treatment systems, including training in feeding procedures and proper use of equipment.

The Discharger shall ensure that its operations staff are familiar with the BMP Plan and have been adequately trained in the specific procedures it requires.

**E. Waste Disposal**

1. Collected screenings, sludges, and other solids, including fish carcasses, 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. All aquaculture drugs and chemicals that not discharged to receiving waters in accordance with the provisions of this permit shall be disposed of in an environmentally safe manner, according to label guidelines, Material Safety Data Sheet guidelines and the Facility's BMP plan. Any other form of disposal requires approval from the Executive Officer.
3. Any proposed change in disposal practices, shall be reported to the Executive Officer at least **90 days** in advance of the change.



**F. Receiving Water Limitations for the Thermalito Afterbay and the Feather River**

Receiving water limitations are site-specific interpretations of water quality objectives contained in the Basin Plan. As such, they are a required part of this permit. However, a receiving water condition not in conformance with the limitation is not necessarily a violation of this Order. The Regional Board may require an investigation to determine cause and culpability prior to asserting a violation has occurred. The discharge shall not cause the following in the Feather River, nor the Thermalito Afterbay, a tributary to the Feather River:

1. Concentrations of dissolved oxygen to fall below 8.0 mg/L from 1 September to 31 May or 7.0 mg/L. In the event the receiving waters are determined to have a dissolved oxygen concentration less than 7.0 mg/L, the discharge shall not depress the dissolved oxygen concentration below the background level.
2. Electrical conductivity (at 25°C) to exceed 150  $\mu$ mhos/cm (90 percentile).
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 of receiving waters to increase over background levels by more than:
  - a. 1 NTU when background turbidity is between 0 and 5 NTUs;
  - b. 20 percent when background turbidity is between 5 and 50 NTUs;
  - c. 10 NTUs when background turbidity is between 50 and 100 NTUs; and
  - d. 10 percent when background turbidity is greater than 100 NTUs.

In determining compliance with the above limits, appropriate averaging periods may be applied upon approval by the Executive Officer.

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

9. Deposition of material that causes nuisance or adversely affects beneficial uses.
10. Increase the normal ambient temperature of waters by more than 5°F (3°C).
11. Taste or odor-producing substances to impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or to cause nuisance or adversely affect beneficial uses.
12. 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.
13. Aquatic communities and populations, including vertebrate, invertebrate, and plant species, to be degraded.
14. Toxic pollutants to be present in the water column, sediments, or biota in concentrations that adversely affect beneficial uses; that produce detrimental physiological responses in human, plant, animal, or aquatic life; or that bioaccumulate in aquatic resources at levels which are harmful to human health.
15. Biostimulatory substances to be present in the water column which promote aquatic growths that cause nuisance or adversely affect beneficial uses.
16. Violation of any applicable water quality standard for receiving waters adopted by the Regional Board or the SWRCB pursuant to the CWA and regulations adopted thereunder.

**F. Provisions**

1. The Discharger shall comply with the attached Monitoring and Reporting Program No. R5-2004-0121, which is part of this Order, and any revisions thereto, as ordered by the Executive Officer. If sufficient information is collected and indicates that the discharge causes, has the reasonable potential to cause, or contributes to an in-stream excursion above a narrative or numerical water quality criterion, then this Order may be reopened to include effluent limit(s) to achieve water quality standards. Additionally, if pollutants are detected in discharges from the Discharger's facility, but insufficient information exists to establish an effluent limit or determine if an effluent limit is necessary, then the Discharger may be required to conduct additional monitoring to provide sufficient information.

When requested by USEPA, the Discharger shall complete and submit additional Discharge Monitoring Reports. The submittal date shall be no later than the submittal date specified in the Monitoring and Reporting Program for Discharge Self-Monitoring Reports.

2. The Discharger shall comply with all the items of the “Standard Provisions and Reporting Requirements for Waste Discharge Requirements (NPDES)”, dated February 2004, which are part of this Order. This attachment and its individual paragraphs are referred to as “Standard Provisions.”
3. The Discharger shall comply with the standards contained in the Health and Safety Code, Chapter 6.67, Aboveground Storage of Petroleum.
4. This permit authorizes the discharge of copper sulfate, acetic acid, potassium permanganate, hydrogen peroxide, Chloramine-T, Formalin, Oxytetracycline, Romet-30<sup>®</sup>, Florfenicol, Penicillin G, amoxicillin, erythromycin, MS 222, Aqui-S<sup>®</sup>, and sodium chloride in accordance with the effluent limitations and other conditions described herein. The Discharger shall submit to the Regional Board in writing the following information prior to the use of any other chemical or aquaculture drug that may enter the wastewater discharge:
  - a. The common name(s) and active ingredient(s) of the drug or chemical proposed for use and discharge.
  - b. The purpose for the proposed use of the drug or chemical (i.e. list the specific disease for treatment and specific species for treatment).
  - c. The amount proposed for use and the resulting calculated concentration in the discharge.
  - d. The duration and frequency of the proposed use.
  - e. Material Safety Data Sheets and available toxicity information.
  - f. Any related INAD, NADA information, extra-label use requirements and/or veterinarian prescriptions.

Prior to discharging the chemical or aquaculture drug, the Discharger also shall conduct and/or submit the results of acute toxicity test information on any new chemical or drug in accordance with *EPA-821-R-02-012*, Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, *Fifth Edition, October 2002*, using *C. dubia*, to determine the NOAEL, and LOAEL.

If the toxicity testing, or above listed information submitted to the Regional Board indicates that the drug or chemical is, or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an in-stream excursion above

any chemical-specific water quality criteria, narrative water quality objective for chemical constituents from the Basin Plan, or narrative water quality objective for toxicity from the Basin Plan, this Order may be reopened to established effluent limitations.

5. The Discharger shall conduct short term toxicity studies in accordance with methods specified in *EPA-821-R-02-012*, to determine the NOAEL, and LOAEL for potassium permanganate, hydrogen peroxide, and Chloramine-T to reflect concentrations and exposure times that are applicable to this facility. The results shall be submitted to the Regional Board within **12 months** of adoption of this Order. The Regional Board will review this information and this permit may be reopened to establish effluent limits for potassium permanganate, hydrogen peroxide, and Chloramine-T based on additional toxicity testing and other available information.
6. The Discharger may conduct studies pertaining to Facility operations, the effluent discharge, and the receiving water. For example, such studies may include a site-specific metals translator study or a mixing zone and dilution study. The Regional Board will review such studies and, if warranted, will reopen this permit to make appropriate changes.
7. **Copper, Effluent Limitation Time Schedule:** Effluent Limitation B.3. requires the Discharger to comply with the daily maximum effluent limitation for total copper. The new final effluent limitation for copper required by this Order shall become effective on **1 September 2009**. The interim effluent limitation for total copper established in Effluent Limitation B.4 supercedes the final effluent limitation provided the Discharger complies with the Tasks listed below.
  - c. During the use of copper, the Discharger shall implement procedures and practices to minimize the concentration of copper in the discharge by using the minimum concentrations necessary for controlling the target organism and treating no more than one raceway at a time.
  - d. The Discharger shall monitor copper during treatments in accordance with Monitoring and Reporting Program No. R5-2004-0121.
  - e. By **1 July** each year the Discharger shall submit a progress report describing the efforts to eliminate the use or discharge of copper to receiving waters.

The final effluent limitations shall become effective immediately if the Discharger fails to comply with these requirements or submit the information requested.

9. In accordance with the requirements in Section D. – Best Management Practices (BMP) Plan, of this Order, the Discharger shall develop and implement a BMP Plan which achieves the objectives and the specific requirements outlined in that section

of the Order. Through implementation of a BMP Plan, the Discharger shall prevent or minimize the generation and discharge of wastes and pollutants from the Facility to the waters of the United States. In the BMP Plan, each component of the Facility shall be evaluated by the Discharger for its waste minimization opportunities and its potential for causing a release of significant amounts of pollutants to receiving waters due to the failure or improper operation of equipment. The examination shall include all normal operations, including raw material and product storage areas, feeding of fish, internal movement of fish, cleaning of rearing/holding units and settling systems, processing and product handling areas, loading or unloading operations, spillage or leaks from the processing floor and dock, and sludge and waste disposal. The BMP Plan shall contain an explicit quantification of the inputs and outputs of the Facility, including fish, feed, feed components, mortalities due to predation and disease, dissolved and solid pollutants, and water. The BMP Plan shall contain a description of specific management practices and standard operating procedures used to achieve the above objectives, including, for example, schedules for solids removal from each waste collection component including what procedures will be used to determine when cleaning is necessary to prevent accumulated solids from being discharged. The BMP Plan shall contain a statement that the BMP Plan has been reviewed and endorsed by the Facility Manager and the individuals responsible for implementation of the BMP operating plan. The Discharger shall ensure that its operations staff is familiar with the BMP Plan and have been adequately trained in the specific procedures which it requires. The Discharger shall maintain a copy of the BMP Plan at the Facility and shall make the plan available upon request to representatives of the Regional Board.

10. The Discharger shall report promptly to the Regional Board any material change or proposed change in the character, location, or volume of the discharge or water treatment chemicals or biocides used. Notification on water treatment chemical changes shall include information from the manufacturer on toxicity and hazardous classifications.
11. A copy of this Order shall be kept at the discharge facility for reference by operating personnel. Key operating personnel shall be familiar with its contents.
12. This Order expires on **1 September 2009** 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 an application for renewal of waste discharge requirements if it wishes to continue the discharge.
13. The Department of Water Resources (DWR), as owner of the real property at which the discharge will occur, is ultimately responsible for ensuring compliance with these requirements. The DFG retains primary responsibility for compliance with these

requirements, including day-to-day operations and monitoring. Enforcement actions will be taken against the DWR only in the event that enforcement actions against DFG are ineffective or would be futile, or that enforcement is necessary to protect public health or the environment.

14. In the event of any change in control or ownership of land or waste discharge facilities presently 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.

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, the name, address, and the 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 CWC. 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 Regional Board, Central Valley Region, on 10 September 2004.

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THOMAS R. PINKOS, Executive Officer

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

NPDES NO. CA0082350

MONITORING AND REPORTING PROGRAM NO. R5-2004-0121

FOR  
STATE OF CALIFORNIA  
DEPARTMENT OF FISH AND GAME AND  
DEPARTMENT OF WATER RESOURCES  
FEATHER RIVER FISH HATCHERY-  
THERMALITO ANNEX FACILITY  
BUTTE COUNTY

**INTRODUCTION**

This Monitoring and Reporting Program is issued pursuant to California Water Code §13267 and §13383 and includes: influent monitoring of raw water supply, effluent monitoring of discharges to waters of the United States and waters of the State, and receiving water monitoring. All water quality samples shall be representative of the volume and nature of the discharge, or representative of the matrix of material sampled. The time, date, and location of sample collection shall be recorded on a chain of custody (COC) form. COC forms shall be completed for each sample collected and copies provided to the Regional Board with the monthly monitoring reports.

Water quality samples do not need to be taken during months when there are no pollutant discharges to surface waters resulting from aquaculture operations, or associated on-site fish processing (e.g. no monitoring is required if no fish are being held at the facility, monitoring for specific chemicals or drugs only when being used and discharged to surface waters). However, monitoring forms are still required to be submitted on a monthly basis during these periods documenting no discharge.

All water quality sampling and analyses shall be performed in accordance with the Monitoring and Reporting Requirements as outlined in Section C of the Standard Provisions of this Order. Water quality sample collection, storage, and analyses shall be performed according to 40 CFR Part 136, or other methods approved and specified by the Executive Officer in accordance with an approved Quality Assurance-Quality Control Program.

**INFLUENT MONITORING**

A sampling station shall be established and located where representative samples of the raw water supply can be obtained. Samples shall be collected at approximately the same time as effluent samples. Influent monitoring shall include at least the following:

<b><u>Constituent</u></b>	<b><u>Unit</u></b>	<b><u>Type of Sample</u></b>	<b><u>Sampling Frequency</u></b>
Influent flow	cfs	meter	Daily
Total Suspended Solids	mg/L	Grab	Monthly

**EFFLUENT MONITORING (Discharge 001)**

Effluent samples shall be collected from the Discharge 001 (sampling port station). Effluent samples shall be representative of the volume and quality of the discharge. Effluent samples shall be collected during or immediately following raceway cleaning or administration of drug or chemical treatments and must be representative of the volume and quality of the discharge at the time when representative levels of solids, drugs, chemicals, or other pollutants are present in the discharge. Samples collected from the sampling port station will be considered adequately composited. Time of collection of samples shall be recorded. Effluent monitoring shall include the following:

<b>Constituent</b>	<b>Units</b>	<b>Type of Sample</b>	<b>Sampling Frequency</b>
Effluent Flow	gpd	Calibrated meter, weir, or other approved method	Continuous
Total suspended solids (TSS)	mg/L	Grab	1/ month
<b>Net TSS</b> (effluent minus influent)	mg/L	Net calculation	1/ month
Settleable solids	ml/L	Grab	1/ month
pH	units	Grab	1 / month
Specific Conductance (Electrical Conductivity @ 25°C) <sup>1</sup>	µmhos/cm	Grab	1 / month
Chloride <sup>1</sup>	mg/L	Grab	1/ month
Formaldehyde <sup>2</sup>	mg/L	Grab	1/ month during use
Hydrogen peroxide <sup>3</sup>	mg/L	Grab	1/ month during use
Potassium permanganate <sup>3</sup>	mg/L	Grab	1/ month during use
Chloramine-T <sup>3</sup>	mg/L	Grab	1/ month during use
Copper (Total Recoverable) <sup>4</sup>	µg/L	Grab	1/ day during use

- <sup>1</sup> In months when sodium chloride is being used for treatment, specific conductance and chloride shall be measured during sodium chloride use.
- <sup>2</sup> In months when formalin is added to the waters of the Facility, formaldehyde concentration shall be measured during formalin use.
- <sup>3</sup> The analytical method used for hydrogen peroxide, potassium permanganate, and Chloramine-T shall be approved by the Executive Officer. If no approved methods are available effluent concentrations may be determined by calculation as approved by the Executive Officer.
- <sup>4</sup> Sample for total copper when copper sulfate is used as a flush treatment. The sample shall be collected during the time of peak discharge of copper, no later than one hour after start of treatment. Hardness and pH shall be sampled simultaneously. The Discharger shall also report the amount of copper sulfate used in each raceway, the number of raceways cleaned, the time of the raceway cleaning and the time the sample is taken. The highest acceptable minimum level (ML) for calibration purposes for copper is 0.5 µg/L.



**RECEIVING WATER MONITORING IN THERMALITO AFTERBAY**

Receiving water samples shall be collected monthly when fish are being held at the Facility, and when there is a direct discharge from Discharge 001 to the Thermalito Afterbay. All receiving water samples shall be grab samples collected at a depth of 6 to 12 inches below the surface, 5' from shore. Receiving water monitoring shall include at least the following:

- R-1 Located 125 feet above the discharge pipe outfall structure, 5' from the shoreline in the Thermalito Afterbay (See Attachment B of this Order).
- R-2 50 feet below the discharge pipe outfall structure, 5' from the shoreline in the Thermalito Afterbay (See Attachment B of this Order).

<u>Constituent</u>	<u>Unit</u>	<u>Station</u>	<u>Sampling Frequency</u>
Hardness <sup>1</sup>	mg/L	R-1	Daily During Copper Use
pH	units	R-1, R-2	1/month (Daily During Copper Use <sup>2</sup> )
Temperature	°C	R-1, R-2	1/month
Dissolved Oxygen	mg/L	R-1, R-2	1/month
Specific Conductance <sup>3</sup>	µmhos/cm	R-1, R-2	1/month
Turbidity	NTU	R-1, R-2	1/month

<sup>1</sup> When a copper sulfate solution is added to the waters of the Facility, hardness and pH shall be sampled and reported with the copper results.  
<sup>2</sup> Daily during copper (e.g., copper sulfate) treatments only.  
<sup>3</sup> When sodium chloride is added to waters of the Facility.

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

### MONTHLY DRUG AND CHEMICAL USE REPORT

The following information shall be submitted for all aquaculture drugs or chemicals used at the Facility:

- a. The name(s) and active ingredient(s) of the drug or chemical.
- b. The date(s) of application.
- c. The purpose(s) for the application.
- d. The method of application (e.g., immersion bath, administered in feed), duration of treatment, whether the treatment was static or flush (for drugs or chemicals applied directly to water), amount in gallons or pounds used, treatment concentration(s), and the flow in cubic feet per second (cfs) in the treatment units.
- e. The total flow through the facility in cubic feet per second (cfs) to the Thermalito Afterbay after mixing with the treated water.
- f. For drugs and chemicals applied directly to water (i.e., immersion bath, flush treatment) and for which effluent monitoring is not otherwise required, the estimated concentration in the effluent at the point of discharge to the Thermalito Afterbay.
- g. The method of disposal for drugs or chemicals used but not discharged in the effluent.

#### **Calculation of Concentration:**

For drugs or chemicals used in an immersion bath, “drip” treatment, or in other direct application to waters at the facility, use the following formula to calculate concentration (C) at the point of discharge.

C = concentration of chemical or drug at the point of discharge

$C = (\text{treatment concentration}) \times (\text{flow in treatment area}) \div (\text{flow at point of discharge})$

#### **Example: Potassium permanganate concentration**

$C = 2.0 \text{ mg/L (potassium permanganate)} \times \frac{0.45 \text{ mgd (flow through treatment area)}}{5.0 \text{ mgd (flow at point of discharge)}}$

$C = 2.0 \text{ mg/L} \times 0.09$

**C = 0.18 mg/L potassium permanganate at the point of discharge**

This information shall be submitted monthly. If the analysis of this chemical use data compared with any toxicity testing results or other available information for the therapeutic agent, chemical or

anesthetic indicates that the discharge may cause, have the reasonable potential to cause, or contribute to an excursion of a numeric or narrative water quality criterion or objective, the Executive Officer may require site specific whole effluent toxicity (WET) tests using *C. dubia* or this Order may be reopened to include an effluent limitation based on that objective.

### PRIORITY POLLUTANT METALS MONITORING

The State Water Resources Control Board (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). The SIP states that the Regional Boards will require periodic monitoring (at least once prior to issuance and reissuance of a permit) for pollutants for which criteria or objectives apply and for which no effluent limitations have been established.

The Regional Board has determined that, based on priority pollutant data received to date, discharge of priority pollutants other than metals is highly unlikely. Accordingly, the Regional Board is requiring, as part of this Monitoring and Reporting Program, that the Discharger conduct effluent and receiving water monitoring (at a receiving water station upstream of the point of discharge) and analysis of priority pollutant metals **one time at least 180 days but no more than 365 days prior to expiration of this Order.**

The Discharger must analyze pH and hardness of the effluent and receiving water at the same time as priority pollutant metals. The priority pollutant metals for which this one-time analysis is required are as follows:

- |                       |            |
|-----------------------|------------|
| ▪ Antimony            | ▪ Lead     |
| ▪ Arsenic             | ▪ Mercury  |
| ▪ Beryllium           | ▪ Nickel   |
| ▪ Cadmium             | ▪ Selenium |
| ▪ Chromium (III)      | ▪ Silver   |
| ▪ Chromium (IV)       | ▪ Thallium |
| ▪ Copper <sup>1</sup> | ▪ Zinc     |

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<sup>1</sup> The Order includes effluent limitations for copper; therefore, more frequent effluent monitoring for copper is required when copper sulfate is used, as specified elsewhere in this Monitoring and Reporting Program.

Metals shall be analyzed by the USEPA methods listed below. Alternative analytical procedures may be used with approval by the Regional Board if the alternative method has the same or better detection level than the method listed.

Method Description	EPA Method	Constituents
Inductively Coupled Plasma/Mass Spectrometry (ICP/MS)	1638	Antimony, Beryllium, Cadmium, Copper, Lead, Nickel, Selenium, Silver, Thallium, Total Chromium, Zinc
Cold Vapor Atomic Absorption (CVAA)	1631	Mercury
Gaseous Hydride Atomic Absorption (HYDRIDE)	206.3	Arsenic
Flame Atomic Absorption (FAA)	218.4	Chromium VI

All priority pollutant metal analyses shall be performed at a laboratory certified by the DHS. The laboratory is required to submit the Minimum Level (ML) and the Method Detection Limit (MDL) with the reported results for each constituent. The MDL should be as close as practicable to the U.S. EPA MDL determined by the procedure found in 40 CFR Part 136. The results of analytical determinations for the presence of chemical constituents in a sample shall use the following reporting protocols:

- a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory.
- b. Sample results less than the reported ML, but greater than or equal to the laboratory's MDL, shall be reported as "Detected but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.
- c. For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration." Numerical estimates of data quality may be by percent accuracy (+ or - a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.
- d. Sample results that are less than the laboratory's MDL shall be reported as "Not Detected" or ND.

### GENERAL REPORTING REQUIREMENTS

The Discharger shall implement the above monitoring program on the first day of the month following adoption of the Order. The Discharger shall submit monthly monitoring reports to the regional Board by the **first day of the second month** following sample collection (i.e., the January report is due by 1 March). Annual monitoring reports shall be submitted by the first day of the second month following each calendar year, respectively. All reports submitted in response to this Order shall comply with signatory requirements of Standard Provision D.6.

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

1. A tabulation by month of the pounds of fish produced during the previous year including:
2. A summary of information on monthly land application and land disposal of solids and wastewater during the previous year including the type and amount of solids and wastewater that are land-applied or land disposed.
3. A summary of all feeding practices used at the facility on a monthly basis including:
  - a. The name(s), type(s) and amount(s) of feed(s) used.
  - b. The percent of phosphorus in the feed(s) used (as available).
  - c. The method and frequency of feeding.
4. Monthly records documenting cleaning, inspections, maintenance, and repairs of all production and wastewater treatment systems.

In the event the Discharger becomes aware of a violation of the Discharge Prohibitions, Discharge Specifications, Effluent Limitations or Groundwater Limitations of this Order, the Discharger shall notify the Board by telephone within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within 5 days.

In the event that there is failure in or damage to the structure of an aquatic animal containment system that results in an unanticipated material discharge of pollutants to waters of the United States or waters of the State, the Discharger shall provide an oral report within 24 hours describing the cause of the failure or damage and identifying the materials that have been released to the environment as a result of the failure or damage. Within 7 days of discovery of the failure or damage, the Discharger shall provide a written report documenting the cause, the estimated time elapsed until the failure or damage was repaired, and steps being taken to prevent a recurrence.

If the Discharger monitors any pollutant more frequently than is required by this Order, the results of such monitoring shall be included in the calculation of the values required in the monthly monitoring report. Such increased frequency also shall be indicated on the monthly monitoring report.

Ordered by: \_\_\_\_\_  
THOMAS R. PINKOS, Executive Officer

\_\_\_\_\_  
10 September 2004  
(Date)

## INFORMATION SHEET

ORDER NO. R5-2004-0121  
STATE OF CALIFORNIA DEPARTMENT OF FISH AND GAME  
AND DEPARTMENT OF WATER RESOURCES  
FEATHER RIVER FISH HATCHERY – THERMALITO ANNEX FACILITY  
BUTTE COUNTY

### FACILITY DESCRIPTION

The Feather River Fish Hatchery – Thermalito Annex Facility (Facility) is located on Assessor's Parcel No. 030-320-017, adjacent to the western shoreline of the Thermalito Afterbay on the east side of Highway 99 near Oroville, in Section 10, T19N, R3E, as shown on Attachment A. The Facility is owned by the Department of Water Resources and operated by the Department of Fish and Game. The Facility lies on the eastern edge of the Butte Basin Hydrologic Area (HA) No. 520.40, as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986. The discharge from the Facility is pumped over a levee embankment into the Thermalito Afterbay, a separate Hydrologic Area of the Lower Feather River HA No. 515.40. The discharge is presently governed by Order No. 94-092 (NPDES No. CA0082350), adopted by the Regional Board on 22 April 1994.

The Facility is a fish-rearing annex of the main Feather River Fish Hatchery located in Oroville. Fry are hatched at the Feather River Hatchery and transported to the Facility by tanker truck. Fry are reared at the Facility for only four to six months, typically January through June, and the Facility is closed the remainder of the year. After four months, the fingerlings are transported back to the Feather River Hatchery and raised to smolt size prior to release. Small quantities of steelhead fry are also raised at the Facility on occasion. The amount of fish raised and the amount of feed used in 1998 through 2003 is summarized in below:

*Amount of fish raised and amount of feed used at the Thermalito Annex Facility, 1998-2003:*

	<b>1998</b>	<b>1999</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>
<b>Amount of fish raised (lbs)</b>	80,145	58,370	102,560	55,475	54,431	54,803
<b>Amount of feed used (lbs)</b>	86,772	52,978	86,225	40,949	36,380	44,602

The Facility is the preferred fish rearing site for the Feather River Fish Hatchery because it has significantly warmer water than the Feather River Hatchery, thus reducing the incidence of cold water viruses amongst the fry and fingerlings. Fish egg incubation does not occur at the Facility, as all the egg incubation occurs at the Feather River Fish Hatchery.

The facilities consist of a permanent residential trailer for a full-time caretaker, a domestic wastewater holding tank, an office and maintenance building, an aeration tower for the water supply, four parallel concrete raceways (approximately 600 feet long) each with a separate sump basin and pump. The Discharger pumps raw water from five adjacent groundwater wells operated by DWR. Groundwater is pumped to the aeration tower and piped to the four raceways. Currently,

a minimum of 3.35 mgd (5.2 cfs) of aerated water flows through the Facility, with a design maximum of 7.8 mgd (12.1 cfs). Each of the four raceways uses a minimum of 0.863 mgd (1.3 cfs) of flow-through water, and a design maximum of 19.5 mgd (3.03 cfs). Each raceway drains directly into one of the two sumps. Wastewater is pumped from each sump directly into the discharge pipeline and is pumped over a levy embankment into the Thermalito Afterbay. The pipeline outfall is located approximately 10 feet beneath the surface of the Thermalito Afterbay, approximately 20 feet from shore (Discharge Point 001) as shown on Attachment B.

The Discharger performed a tracer dye study using rhodamine dye to determine the direction of the Facility's effluent movement in the Thermalito Afterbay, and to determine new locations for upstream and downstream receiving water sampling locations. The purpose of the dye study was to establish typical flow patterns from the end of the effluent discharge pipe, as well as flow directions in the Thermalito Afterbay. Based on the results of the tracer dye study submitted by the Discharger on 26 January 2000, Regional Board Staff revised the locations of the receiving water monitoring stations as shown on Attachment B.

Wastes generated at the Facility include fish fecal material, unconsumed fish food, nutrients, algae, silt, chemicals and therapeutic agents used to treat fish and control disease. Existing wastewater treatment technology (such as settling basins and vacuum cleaning) is capable of dependably removing fish hatchery wastewater constituents to concentrations which are below the level at which the beneficial uses of surface and/or groundwater are adversely affected. However, there are no settling basins located at the Facility, and wastewater is discharged directly from the sumps to the Thermalito Afterbay via the discharge pipeline.

Obtaining a representative sample of the Facility's effluent has historically been difficult, as the two sumps discharge through two separate pumps into the common discharge line. Prior to 1997, self-monitoring reports, as well as Regional Board staff sampling, had documented the discharge of wastewater from the Facility with settleable matter and suspended matter in excess of effluent limits. In order to reduce settleable matter concentrations, the Discharger implemented multiple operational changes in 1997, including decreasing the frequency of raceway cleaning and changing the type of fish food used at the Facility from a moist food pellet to dry food pellets. The number of raceways scrubbed and cleaned per day has been reduced from four, to two. In addition, the sump basins are now emptied and cleaned out at the end of each rearing season, and sludge deposits are removed and disposed of off-site. The Discharger also installed a sampling port on the discharge pipe to attain better representative samples of the combined effluent being discharged to the Thermalito Afterbay. Due to these operational changes, no effluent limitation violations have been reported for settleable or suspended matter since October 1997.

The use of chemicals at the Facility is primarily a disease prevention measure. Chemicals are used at the Facility to treat fish directly for parasites, fungi, and bacteria, as well as to clean rearing raceways in order to reduce the spread of disease. Chemicals currently used at the Facility include copper sulfate, acetic acid, potassium permanganate and sodium chloride (salt).

Chemicals that are not currently used at the Facility, but may possibly be used in the future include Formalin (as a 37% formaldehyde, methanol-free solution) and Chloramine-T. Antibiotics such as Oxytetracycline (Terramycin<sup>®</sup>), Amoxicillin trihydrate, Romet-30<sup>®</sup> (Sulfadimethoxine-ormetroprim), erythromycin, and Florfenicol may be used during periods of disease outbreak. Penicillin G, an antibiotic, may be used as an immersive bath treatment during periods of disease outbreak at the Facility. Tricane methanesulfonate (MS-222), carbon dioxide and Aqui-S<sup>®</sup> may be used to anesthetize fish. Vaccines, such as Vibrio vaccine may also be used. PVP Iodine solution is not used as no fish eggs are incubated or treated at the Facility.

Domestic wastewater is retained in a 6,000 gallon holding tank which is pumped out every four to six weeks by a commercial sewage hauler.

The Facility has one 1,000-gallon split aboveground petroleum storage tank (AST) for diesel and gasoline fuel. The tank is stand mounted over a concrete pad with secondary containment. The diesel fuel is used for a back-up generator, and the gasoline is used for trucks and a mechanical feeder. No vehicle maintenance is performed on-site.

### **APPLICABLE REGULATIONS, POLICIES, AND PLANS**

A cold-water concentrated aquatic animal production (CAAP) facility is defined in Title 40 of the Code of Federal Regulations (40 CFR 122.24) as a fish hatchery, fish farm, or other facility which contains, grows, or holds cold-water fish species or other cold water aquatic animals including, but not limited to, the Salmonidae family of fish (e.g. trout and salmon) in ponds, raceways, or other similar structures. In addition, the facility must discharge at least 30 calendar days per year, produce at least 20,000 pounds harvest weight (9,090 kilograms) of aquatic animals per year, and feed at least 5,000 pounds (2,272 kilograms) of food during the calendar month of maximum feeding. A facility that does not meet the above criteria may also be designated a cold water CAAP facility upon a determination that the facility is a significant contributor of pollution to waters of the United States [40 CFR 122.24(c)]. Cold water, flow-through CAAP facilities are designed to allow the continuous flow of fresh water through tanks and raceways used to produce aquatic animals (typically cold-water fish species). Flows from CAAP facilities ultimately are discharged to waters of the United States. 40 CFR 122.24 specifies that CAAP facilities are point sources subject to the National Pollutant Discharge Elimination System (NPDES) program. The Discharger's facility meets the definition of a cold-water, flow-through CAAP.

The operation of CAAP facilities may introduce a variety of pollutants into receiving waters. U.S. Environmental Protection Agency (USEPA) identifies three classes of pollutants: (1) conventional pollutants (i.e., total suspended solids (TSS), oil and grease (O&G), biochemical oxygen demand (BOD), fecal coliforms, and pH); (2) toxic pollutants (e.g., metals such as copper, lead, nickel, and zinc and other toxic pollutants; and (3) non-conventional pollutants (e.g., ammonia-N, formalin, and phosphorus). The most significant pollutants discharged from CAAP facilities are solids from uneaten feed, as well as fish feces that settles to the bottom of the



raceways. Both of these types of solids are primarily composed of organic matter including BOD, organic nitrogen, and organic phosphorus.

Fish raised in CAAP facilities may become vulnerable to disease and parasite infestations. Various aquaculture drugs and chemicals are used periodically at CAAP facilities to ensure the health and productivity of the confined fish population, as well as to maintain production efficiency. Aquaculture drugs and chemicals are used to clean raceways and to treat fish for parasites, fungal growths and bacterial infections. Aquaculture drugs and chemicals are also used to anesthetize fish prior to spawning or prior to the annual “tagging” process. As a result of these operations and practices, drugs and chemicals may be present in discharges to waters of the United States or waters of the State.

In August 2004, USEPA promulgated Effluent Limitation Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category (hereafter “ELG”). The ELG regulation establishes national technology-based effluent discharge requirements for flow-through and recirculating systems and for net pens based on Best Practicable Control Technology Currently Available (BPT); Best Control Technology for Conventional Pollutants (BCT); Best Available Technology Economically Achievable (BAT); and New Source Performance Standards (NSPS). In its proposed rule, published on 12 September 2002, USEPA proposed to establish numeric limitations for a single constituent – total suspended solids (TSS) – while controlling the discharge of other constituents through narrative requirements. In the final rule, however, USEPA determined that, for a nationally applicable regulation, it would be more appropriate to promulgate qualitative TSS limitations in the form of solids control best management practices (BMP) requirements. Furthermore, the final ELG does not include numeric effluent limitations for non-conventional and toxic constituents, such as aquaculture drugs and chemicals, but also relies on narrative limitations to address these constituents.

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 describes an implementation program and policies to achieve water quality objectives for all waters of the Basin. This includes plans and policies adopted by the State Water Resources Control Board (SWRCB) and incorporated by reference, such as Resolution No. 68-16, “Statement of Policy with Respect to Maintaining High Quality of Waters in California” (Resolution No. 68-16). These requirements implement the Basin Plan. The Basin Plans, as amended, designate beneficial uses, establish water quality objectives, and contain implementation plans and policies for waters of the Basins. Pursuant to the California Water Code §13263(a), waste discharge requirements must implement the Basin Plans.

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.

Resolution No. 68-16 requires the Regional Board, in regulating discharges of waste, to maintain high quality waters of the State until it is demonstrated that any change in water quality will be consistent with the maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in the Regional Board's policies (e.g., water quality constituents in concentrations that exceed water quality objectives). Resolution No. 68-16 requires that discharges be regulated to meet best practicable treatment or control in order to assure that pollution or nuisance will not occur; and the highest water quality be consistently maintained for the maximum benefit to the people of the State. The Regional Board has considered Resolution No. 68-16 and Federal antidegradation regulations at 40 CFR 131.12.

## **REGULATION OF AQUACULTURE DRUGS AND CHEMICALS**

CAAP facilities produce fish and other aquatic animals in greater numbers than natural stream conditions would allow; therefore, system management is important to ensure that fish do not become overly stressed, making them more susceptible to disease outbreaks. The periodic use of various aquaculture drugs and chemicals is needed to ensure the health and productivity of cultured aquatic stocks and to maintain production efficiency.

CAAP facilities may legally obtain and use aquaculture drugs in one of several ways. Some aquaculture drugs and chemicals used at CAAP facilities in the Region are approved by the U.S. Food and Drug Administration (FDA) for certain aquaculture uses on certain aquatic species. Others have an exemption from this approval process when used under certain specified conditions. Still others are not approved for use in aquaculture, but are considered to be of "low regulatory priority" by FDA (hereafter "LRP drug"). FDA is unlikely to take regulatory action related to the use of a LRP drug if an appropriate grade of the chemical or drug is used, good management practices are followed, and local environmental requirements are met (including NPDES permit requirements). Finally, some drugs and chemicals may be used for purposes, or in a manner not listed on their label (i.e., "extra-label" use) under the direction of licensed veterinarians for the treatment of specific fish diseases diagnosed by fish pathologists. It is assumed that veterinarian-prescribed aquaculture drugs are used only for *short periods of duration* during acute disease outbreaks. Each of these methods of obtaining and using aquaculture drugs is discussed in further detail below.

It is the responsibility of those using, prescribing, or recommending the use of these products to know which aquaculture drugs and chemicals may be used in CAAP facilities in the Region under all applicable federal, State, and local regulations and which aquaculture drugs and chemicals may be discharged to waters of the United States and waters of the State in accordance with this permit. A summary of regulatory authorities related to aquaculture drugs and chemicals is outlined below.

Summary of Regulatory Authorities

FDA is responsible for ensuring the safety, wholesomeness, and proper labeling of food products; ensuring the safety and effectiveness of both human and animal drugs; and ensuring compliance with existing laws governing these drugs. The Federal Food, Drug, and Cosmetic Act (FFDCA), the basic food and drug law of the United States, includes provisions for regulating the manufacture, distribution, and the use of, among other things, new animal drugs and animal feed. FDA's enforcement activities include correction and prevention of violations, removing illegal products or goods from the market, and punishing offenders. Part of this enforcement includes testing domestic and imported aquacultural products for drug and pesticide residues.

FDA's Center for Veterinary Medicine (CVM) regulates the manufacture, distribution, and use of animal drugs. CVM is responsible for ensuring that drugs used in food-producing animals are safe and effective and that food products derived from treated animals are free from potentially harmful residues. CVM approves the use of new animal drugs based on data provided by a sponsor (usually a drug company). To be approved by CVM, an animal drug must be effective for the claim on the label) and safe when used as directed for (1) treated animals; (2) persons administering the treatment; (3) the environment, including non-target organisms; and (4) consumers. CVM establishes tolerances and animal withdrawal periods as needed for all drugs approved for use in food-producing animals. CVM has the authority to grant investigational new animal drug (INAD) exemptions so that data can be generated to support the approval of a new animal drug.

There are several options for CAAP facilities to legally obtain and use aquaculture drugs. Aquaculture drugs and chemicals can be divided into four categories as outlined below: approved drugs, investigational drugs, unapproved drugs of low regulatory priority, and extra-label use drugs.

- ***FDA approved new animal drugs***

Approved new animal drugs have been screened by the FDA to determine whether they cause significant adverse public health or environmental impacts when used in accordance with label instructions. Currently, there are six new animal drugs approved by FDA for use in food-producing aquatic species. These six FDA-approved new animal drugs are:

1. Chorionic gonadotropin (Chlorulun<sup>®</sup>), used for spawning;
2. Oxytetracycline (Terramycin<sup>®</sup>), an antibiotic;
3. Sulfadimethoxine-orometoprim (Romet-30<sup>®</sup>), an antibiotic;
4. Tricain methanesulfonate (MS-222, Finquel<sup>®</sup> and Tricaine-S), an anesthetic;
5. Formalin (Formalin-F<sup>®</sup>, Paracide F<sup>®</sup> and PARASITE-S<sup>®</sup>), used as a fungus and parasite treatment; and
6. Sulfamerazine, an antibiotic.

Each aquaculture drug in this category is approved by FDA for use on specific fish species, for specific disease conditions, for specific dosages, and with specific withdrawal times. Product withdrawal times must be observed to ensure that any product used on aquatic animals at a CAAP facility does not exceed legal tolerance levels in the animal tissue. Observance of the proper withdrawal time helps ensure that products reaching consumers are safe and wholesome.

FDA-approved new animal drugs that are added to aquaculture feed must be specifically approved for use in aquaculture feed. Drugs approved by FDA for use in feed must be found safe and effective. Approved new animal drugs may be mixed in feed for uses and at levels that are specified in FDA medicated-feed regulations only. It is unlawful to add drugs to feed unless the drugs are approved for feed use. For example, producers may not top-dress feed with a water-soluble, over-the-counter antibiotic product. Some medicated feeds, such as Romet-30<sup>®</sup>, may be manufactured only after the FDA has approved a medicated-feed application (FDA Form 1900) submitted by the feed manufacturer.

- ***FDA Investigational New Animal Drugs (INAD)***

Aquaculture drugs in this category can only be used under an investigational new animal drug or “INAD” exemption. INAD exemptions are granted by FDA CVM to permit the purchase, shipment and use of an unapproved new animal drug for investigational purposes. INAD exemptions are granted by FDA CVM with the expectation that meaningful data will be generated to support the approval of a new animal drug by FDA in the future. Numerous FDA requirements must be met for the establishment and maintenance of aquaculture INADs.

There are two types of INADs: standard and compassionate. Aquaculture INADs, most of which are compassionate, consist of two types: routine and emergency. A compassionate INAD exemption is used in cases in which the aquatic animal’s health is of primary concern. In certain situations, producers can use unapproved drugs for clinical investigations (under a compassionate INAD exemption) subject to FDA approval. In these cases, CAAP facilities are used to conduct closely monitored clinical field trials. FDA reviews test protocols, authorizes specific conditions of use, and closely monitors any drug use under an INAD exemption. An application to renew an INAD exemption is required each year. Data recording and reporting are required under the INAD exemption in order to support the approval of a new animal drug or an extension of approval for new uses of the drug.

- ***FDA Unapproved new animal drugs of low regulatory priority (LRP drugs)***

LRP drugs do not require a new animal drug application (NADA) or INAD exemptions from FDA. Further regulatory action is unlikely to be taken by FDA on LRP drugs as long as an appropriate grade of the drug or chemical is used, good management practices are followed, and local environmental requirements are met (such as NPDES permit requirements contained in this Permit). LRP drugs commonly used at CAAP facilities in the Region include the following:

1. Acetic acid, used as a dip at a concentration of 1,000-2,000 mg/L for 1-10 minutes as a parasiticide for fish.
2. Carbon dioxide gas, used for anesthetic purposes in cold, cool and warm water fish.
3. Hydrogen peroxide, used at 250-500 mg/L to control fungi on all species and life stages of fish, including eggs.
4. Povidone iodine (PVP) compounds, used as a fish egg disinfectant at rates of 50 mg/L for 30 minutes during egg hardening and 100 mg/L solution for 10 minutes after water hardening.
5. Sodium bicarbonate (baking soda), used at 142-642 mg/L for 5 minutes as a means of introducing carbon dioxide into the water to anesthetize fish.
6. Sodium chloride (salt), used at 0.5-1% solution for an indefinite period as an osmoregulatory aid for the relief of stress and prevention of shock. Used as 3% solution for 10-30 minutes as a parasiticide.

FDA is unlikely to object at present to the use of these LRP drugs if the following conditions are met:

1. The aquaculture drugs are used for the prescribed indications, including species and life stages where specified.
2. The aquaculture drugs are used at the prescribed dosages (as listed above).
3. The aquaculture drugs are used according to good management practices.
4. The product is of an appropriate grade for use in food animals.
5. An adverse effect on the environment is unlikely.

FDA's enforcement position on the use of these substances should be considered neither an approval nor an affirmation of their safety and effectiveness. Based on information available in the future, FDA may take a different position on their use. In addition, FDA notes that classification of substances as new animal drugs of LRP does not exempt CAAP facilities from complying with all other federal, state and local environmental requirements, including compliance with this Permit.

- ***Extra-label use of an approved new animal drug***

Extra-label drug use is the actual or intended use of an approved new animal drug in a manner that is not in accordance with the approved label directions. This includes, but is not limited to, use on species or for indications not listed on the label. Only a licensed veterinarian may prescribe extra-label drugs under FDA CVM's extra-label drug use policy. CVM's extra-label use drug policy (CVM Compliance Policy Guide 7125.06) states that licensed veterinarians may consider extra-label drug use in treating food-producing animals if the health of the animals is immediately threatened and if further suffering or death would result from failure to treat the affected animals. CVM's extra-label drug use policy does not allow the use of drugs to prevent diseases (prophylactic use), improve growth rates, or enhance reproduction or fertility. Spawning hormones cannot be used under the extra-label policy. In addition, the veterinarian assumes the responsibility for drug safety and efficacy and for potential residues in the aquatic animals.

### **RECEIVING WATER BENEFICIAL USES**

The Thermalito Forebay and the Thermalito Afterbay are a large off-stream water storage and power-regulating reservoir complex located west of the Feather River. Water from the Feather River is diverted into the Thermalito Power Canal at the Thermalito Diversion dam, which is located approximately four miles downstream of Oroville Dam and the Edward Hyatt Powerplant. The Power Canal delivers water to the Thermalito Forebay, which is the off-stream regulating reservoir for the Thermalito Pumping-Generating Plant. Water is in turn released into the Thermalito Afterbay from the Forebay.

The Thermalito Afterbay provides storage for pump-back operations for Lake Oroville (i.e. water is pumped back into Lake Oroville during off-peak hours when energy prices are low). The Afterbay also provides the means to maintain uniform flow in the Feather River downstream of the Oroville-Thermalito Facilities. The Thermalito Afterbay is also used to furnish water to local irrigation water districts in the Oroville area, and serves as a warming basin for agricultural water delivered to farms east of the Afterbay. Local water supply diversions take water directly from the Thermalito Afterbay. The total capacity of Afterbay diversions during peak periods of peak water supply demands is 4,050 cfs. In addition, the Thermalito Afterbay provides multiple recreation sites and recreational opportunities, including hunting, fishing, swimming and boating.

The beneficial uses of the Feather River downstream of the Fish Barrier Dam to the Sacramento River as identified in Table II-1 of the Basin Plan are municipal and domestic supply (MUN), agricultural supply irrigation (AGR), body contact water recreation (REC-1), canoeing and rafting (REC-1), other non-body contact water recreation (REC-2), warm and cold freshwater aquatic habitat (WARM and COLD), warm and cold fish migration (MGR), warm and cold spawning habitat (SPWN), and wildlife habitat (WILD).

The beneficial uses of the Thermalito Afterbay are not specifically identified in the Basin Plan, however the Plan states, “The beneficial uses of any specifically identified water body generally apply to its tributary streams.” Upon review of the agricultural irrigation supply values, habitat values, and recreational uses of the Thermalito Afterbay, the Regional Board has determined that the beneficial uses identified in the Basin Plan for the Feather River are applicable to the Thermalito Afterbay.

- a. *Municipal and Domestic Supply (MUN)*: The Regional Board is required to apply the beneficial uses of municipal and domestic supply to the Thermalito Afterbay based on State Board Resolution No. 88-63 which was incorporated in the Basin Plan pursuant to Regional Board Resolution 89-056. In addition, the State Water Resources Control Board (SWRCB) has issued water rights to existing water users along the Thermalito Afterbay, and along the Feather River downstream of the Thermalito Outlet for domestic and agricultural irrigation uses. The Thermalito Afterbay percolates to groundwater, and is thus a source of drinking water. In

addition to the existing water uses, growth in the area downstream of the Thermalito Outlet is expected to continue, which presents a potential for increased domestic and agricultural uses of the water in the Thermalito Afterbay.

- b. *Agricultural Irrigation (AGR)*: The Thermalito Afterbay is used to furnish water to local agricultural irrigation districts in the Oroville area, including Western Canal Irrigation District and the Sutter Butte Irrigation District. These local water supply diversions take water directly from the Thermalito Afterbay at the Western Canal and Richdale Outlet and the Sutter Butte Canal Outlet. According to DWR, the total capacity of Afterbay diversions during periods of peak water supply demands is 4,050 cfs. A May 1969 agreement between DWR and the Joint Water Districts obligates DWR to provide water at temperatures reasonably related to achieving agricultural production within the Joint Water District service area. Local rice farmers, whose interests are represented under the 1969 agreement, need warmer water during spring and summer for germination and growth of the rice (i.e., 65°F from approximately April through mid-May, and 59°F during the remainder of the growing season). DWR accommodates these farmers by releasing water that is as close as possible to the maximum temperature allowable under the DFG-DWR agreement (i.e., 4°F higher than the objectives stated above).
- c. *Body Contact Water Recreation and Canoeing and Rafting (REC-1), and Non-Body Contact Recreation (REC-2)*: The Thermalito Afterbay offers 17 miles of shoreline and 4,300 surface acres of water, and provides multiple opportunities for boating, water skiing and swimming at numerous public recreation sites located around the shoreline. Non-body contact recreational opportunities around the Afterbay include fishing, picnicking, mountain biking, a shooting range and limited hunting. The Wilbur Road Recreation Area includes a fishing area and a boat launch. The Monument Hill recreation area, located on the east side of the Afterbay, includes facilities for boating, fishing and picnicking. According to DWR, the Monument Hill recreation area is the most heavily used recreation area along the shores of the Afterbay, with over 32,000 visitor days per year. The boating and fishing facilities at the Larkin Road recreation area generate nearly 29,000 visitor days per year (DWR 2001).
- d. *Warm and Cold freshwater aquatic habitat (WARM and COLD)*: According to DWR, the diverse temperature structure of the Afterbay provides suitable habitat for both coldwater and warmwater fish. A popular largemouth bass fishery currently exists, and large trout are sometimes caught near the inlet to the Afterbay. No salmonid stocking currently occurs at the Afterbay; however, these fish may pass into the Afterbay through the Thermalito Pumping-Generating Plant from the Thermalito Forebay. Although limited fish sampling has been conducted by DFG and DWR in the Afterbay, smallmouth bass, rainbow trout, brown trout, bluegill,

black crappie, channel catfish, and carp have all been observed. In addition, most of the Lake Oroville sportfish also occur in the Afterbay to some degree.

- e. *Warm and Cold fish migration (MGR) and spawning habitat (SPWN):* Minimum flows in the Lower Feather River are established by a 1983 agreement between DWR and DFG, concerning the Operation of the Oroville Division of the State Water Project for Management of Fish & Wildlife. The agreement establishes criteria for flow and temperature for the Low Flow Channel of the Feather River and the reach of the Feather River below the Thermalito Afterbay Outlet for the preservation of salmon migration, spawning and rearing habitat. This agreement specifies that DWR release a minimum of 600 cfs into the Feather River from the Thermalito Diversion Dam for fishery purposes. Below the Afterbay Outlet, temperatures must be suitable for fall-run salmon during fall months (after September 15th). From May through August, temperatures must be suitable for shad, striped bass, and other warmwater fish.
  
- f. *Wildlife Habitat (WILD):* The Oroville Wildlife Area (OWA) is located adjacent to the Feather River at the Thermalito Afterbay Outlet. The OWA provides multiple opportunities for fishing, swimming, hunting, nature study and ORV use. The OWA teems with wildlife, including many species of fish and birds. It contains over 75 warmwater ponds and sloughs, along with a vast complex of emergent marsh and flooded cottonwood, willow and sycamore trees. Largemouth bass, channel catfish, bluegill, green sunfish, and carp are highly abundant, along with populations of black and white crappie as well. In addition, portions of the OWA are managed by DFG to provide habitat for nesting and wintering waterfowl. Approximately two percent of the recreational use of this wildlife area is related to waterfowl hunting. The Thermalito Afterbay/Forebay Complex provides resting and foraging habitat for open water and diving waterfowl species (ruddy duck, bufflehead, scaup, ring-necked duck, common goldeneye, and common merganser), that is lacking in the surrounding agricultural areas. Bird-watchers can look for 178 species of birds, including heron and egret rookeries from February to June. The OWA provides fishing access to the majority of the upper reaches of the main stem Feather River; which is the most popular area for steelhead and salmon fishing on the river. The Thermalito Afterbay Outlet, located within the OWA, is the most popular fishing spot in Butte County, hosting tens of thousands of anglers each year.

Beneficial uses of the underlying groundwater are municipal and domestic supply (MUN), industrial service supply (IND), industrial process supply (PRO) and agricultural supply irrigation (AGR).



## **REASONABLE POTENTIAL ANALYSIS AND EFFLUENT LIMITATIONS**

Federal regulations at 40 CFR Section 122.44 require NPDES permits to contain effluent limitations, including technology-based and water quality standards-based limitations and limitations based on toxicity.

Federal regulations at 40 CFR 122.44(d)(1) require effluent limitations for all pollutants that are or may be discharged at a level that will cause, have the reasonable potential to cause, or contribute to an in-stream excursion above a numeric water quality criterion (such as CTR criterion) or a narrative water quality criterion within a State water quality standard. These regulations also set forth a methodology for establishing effluent limitations based on narrative state water quality criteria [40 CFR 122.44(d)(1)(vi)(A-C)].

The USEPA, SWRCB, and Regional Board have adopted or published standards that are used to implement 40 CFR Section 122.44. The USEPA has promulgated the CTR and NTR that established water quality criteria. The SWRCB has adopted the SIP that implements the CTR and NTR. The USEPA has published recommended ambient water quality criteria and the Basin Plan contains numeric and narrative water quality objectives. The Basin Plan contains an Implementation Policy (“Policy for Application of Water Quality Objectives”) that, in part, sets forth a process for translating narrative water quality objective into numeric effluent limitations. The USEPA ambient water quality criteria and the Basin Plan “Policy of Application of Water Quality Objectives” are used to implement 40 CFR Section 122.44(d)(1)(v).

## **TECHNOLOGY-BASED EFFLUENT LIMITATIONS**

### **Total Suspended Solids and Settleable Solids**

Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, the Regional Board determined that numeric technology-based effluent limitations for total suspended solids (TSS) and settleable solids are appropriate. In addition, based upon application of the final ELG for CAAP facilities, the Regional Board is establishing requirements for a BMP Plan.

### **Background**

As noted above, USEPA’s final ELG for the aquaculture industry does not include numeric effluent limitations on any conventional, non-conventional, or toxic constituents. Rather, USEPA promulgated qualitative limitations in the form of BMP requirements. The Regional Board is establishing effluent limitations for discharges of TSS and settleable solids from this Facility. Technology-based requirements in this Order are based on a combination of application of the ELG for BMP requirements and case-by-case numeric limitations developed using best professional judgment (BPJ) and carried over from the previous Order No. 94-092. These effluent limitations

are 5.0 mg/L net TSS as an average monthly limitation and 15 mg/L net TSS as a maximum daily limitation; and 0.1 ml/L settleable solids as an average monthly limitation and 0.2 ml/L settleable solids as a maximum daily limitation. Removal of these numeric limitations for TSS and settleable solids would constitute backsliding under CWA Section 402(o). The Regional Board has determined that these numeric effluent limitations for TSS and settleable solids continue to be applicable to the Facility and that backsliding is not appropriate. This Order does not include mass effluent limitations for TSS because there are no standards that specifically require a mass-based effluent limitation, mass of the pollutant discharged is not specifically related to a measure of operation (40 CFR 122.45(f)(iii)), and, in addition, mass-based effluent limitations for TSS are not necessary because this Order includes both concentration-based limitations and a maximum flow limitation.

#### Relationship Between Technology-based and Water Quality-based Requirements

In addition to carrying over numeric technology-based requirements based on BPJ, the Regional Board considered the need for water quality-based limitations for TSS and settleable solids. The Regional Board determined that the numeric technology-based TSS and settleable solids limitations, along with the requirement for a BMP plan, are sufficient to ensure attainment of Basin Plan water quality objectives for sediment, settleable material, and suspended material.

#### **WATER QUALITY-BASED EFFLUENT LIMITATIONS**

On 11 December 2000, the Discharger was issued a letter under the authority of California Water Code Section 13267 requesting effluent and receiving water monitoring to perform a reasonable potential analysis. The Discharger collected effluent and receiving water samples on 11 February 2003, to determine if the priority pollutants established in the CTR and NTR were detected. Analytical results were submitted for volatile substances, semi-volatile substances, metals, asbestos, 2,3,7,8-TCDD dioxin, and sixteen other dioxin congeners. None of the priority pollutants were detected at concentrations that would cause or contribute to an in-stream excursion above a water quality objective. The effluent sample for priority pollutant metals was collected at a time when the Discharger was not using copper sulfate for disease control. Based on additional analyses conducted during the use of copper sulfate the Regional Board finds that the discharge does have a reasonable potential to cause or contribute to an in-stream excursion above the CTR objective for copper during these short-term treatments. Effluent limitations for copper are included in this Order.

Based information submitted as part of the Report of Waste Discharge, in annual and monthly monitoring reports, in studies performed by and correspondence with DFG, and in independent studies, the Regional Board finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above numeric or narrative water quality objectives for copper, pH, and formaldehyde. Effluent limitations for these constituents are included in this Order. The Regional Board is not obligated to delegate the assimilative capacity of receiving waters to a Discharger. Therefore, the Regional Board establishes water quality-based effluent limitations without benefit

of dilution in this Order. Water quality-based effluent limitations are based on the application of water quality criteria or objectives at the point of discharge.

### **CTR Constituents**

Copper sulfate is currently used at the Facility to clean raceways to control algae and to reduce the growth of external parasites and bacteria on fish. Copper sulfate is typically used when daily salt flushing is not effective in controlling disease or bacteria in the rearing raceways. When used for treating fish to control bacterial diseases, fungal diseases, and external protozoan and metazoan parasites, copper sulfate may be applied under an Investigational New Animal Drug (INAD) exemption authorized by FDA.

The Discharger has reported an annual use of copper sulfate crystals ranging from 10 lbs over a 6 month period in 1998, to 80 lbs over a 4 month period in 2001 during an outbreak of Infectious Hematopoietic Necrosis (IHN) disease at the Facility. Up to 24 oz. (680 grams) of copper sulfate crystals are used per raceway cleaning, with one raceway cleaned at a time. Copper sulfate crystals are pre-mixed with water and acetic acid (to dissolve the copper), and the solution is added to the raceway headworks. The Discharger estimates there is an estimated 2-hour flush of copper sulfate through the raceway. At the minimum flow of 3.35 mgd through the Facility, and with the maximum use of copper sulfate of 24 oz. (1.5 lbs) per raceway cleaning, the maximum calculated concentration of copper in a 2-hour flush to the Thermalito Afterbay is calculated to be 640 ug/L. At the maximum flow of 7.8 mgd with 1.5 lbs of copper, the calculated concentration in a 2-hour flush to the Thermalito Afterbay is calculated to be 277 ug/L. Actual copper concentrations measured during treatment vary with the flow and depend on when the sample was taken during the treatment. The Discharger conducted monitoring in 2002 and 2003, taking grab samples during copper treatments. During some treatments samples were collected at half hour intervals. The maximum reported concentration in the discharge to the Thermalito Afterbay for the treatment of one raceway was 285 ug/L during the copper treatments.

Copper is identified as a priority pollutant in the NTR and CTR. The CTR includes the Ambient Water Quality Criteria for the Protection of Aquatic Life for copper. The Criterion Maximum Concentration (CMC), a 1-hour average, and Criterion Continuous Concentration (CCC), a 4-day average, are hardness dependent as shown in Attachment C. The criteria are expressed in terms of the dissolved fraction of the metal in the water column. Since a site-specific translator has not been developed for copper as described in the SIP Section 1.4.1, the USEPA conversion factor for copper of 0.960 was used for translating the dissolved copper criterion into a total recoverable effluent concentration allowance (ECA) with no dilution.

Copper is added for short-term treatments (2-hour flush) and since the Facility is a flow-through facility with only four raceways without on-line settling, copper is expected to be present in the discharge for approximately the same duration as treatment, typically 8-hours or less. Therefore, the Regional Board is establishing a maximum daily effluent limitation (MDEL) for copper in this Permit based on the acute criterion (CMC) adjusted for receiving water hardness as shown in

Attachment C. The Regional Board determined that an average monthly effluent limit (AMEL) is not appropriate based on the current practice. An example of how the MDEL copper limitation is calculated follows:

Assuming:

- The receiving water hardness is 50 mg/L as CaCO<sub>3</sub>. (The hardness of the Thermalito Afterbay ranges between 23 and 58 mg/L).
- No in-stream dilution allowance.
- Coefficient of Variation (CV) = 0.6 for the lognormal distribution of pollutant concentrations in effluent.

### ***Acute Criterion***

The criterion is expressed as follows:

At a hardness of 50 mg/L (as CaCO<sub>3</sub>)

$$\text{CMC}_{\text{dissolved}} \text{ (in } \mu\text{g/L)} = 0.960 \times \exp^{(0.9422)(\ln \text{ hardness})-1.700}$$

(where 0.960 is the USEPA conversion factor for copper)

$$\text{CMC}_{\text{dissolved}} = 0.960 \times e^{(0.9422)(3.91)-1.700}$$

$$\text{CMC}_{\text{dissolved}} = 0.960 \times e^{1.98}$$

$$\text{CMC}_{\text{dissolved}} = 7.0 \text{ } \mu\text{g/L} \text{ (See Attachment C)}$$

Effluent limitations for most metals must be expressed as total recoverable concentrations [40 CFR 122.45(c)]. To convert the dissolved metal criterion into an equivalent total recoverable criterion, the Regional Board used the conversion factor from the CTR as the translator since no site-specific translator has been developed. Therefore, the total recoverable criterion is:

$$\text{CMC}_{\text{total}} = 7.0 \text{ } \mu\text{g/L} \text{ divided by } 0.960 = 7.3 \text{ } \mu\text{g/L}$$

### ***Effluent Concentration Allowance (ECA) based on acute criterion with no dilution allowance***

$$\text{ECA}_a = 7.3 \text{ } \mu\text{g/L}$$

### ***Long Term Average (LTA) concentration based on acute ECA***

$$\text{LTA}_a = 7.3 \text{ } \mu\text{g/L} \times 0.321 = 2.34 \text{ } \mu\text{g/L}$$

(where 0.321 = acute ECA multiplier at 99% occurrence probability and 99% confidence)

***Maximum Daily Effluent Limit (MDEL)***

$$\text{MDEL} = \text{LTA}_a \times 3.11$$

(where 3.11 = MDEL multiplier at 99% occurrence probability and 99% confidence)

$$\text{MDEL} = 2.34 \times 3.11 = 7.3 \text{ ug/L} \quad (\text{See Attachment C})$$

Based on the calculated concentrations as well as the actual measurements during treatments, the copper concentration in the effluent during treatment exceeds the CMC. The Discharger has requested a compliance time schedule to reduce or eliminate the use of copper and develop substitute treatments.

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 maximum daily effluent limitation for copper is a new requirement in this Order, the Discharger requested a compliance time schedule be granted to allow time to develop alternative treatments. The Discharger indicated that until a substitute treatment is developed there would be a significant loss of fish as a result of parasite and bacterial infestations without the use of copper treatments. The Discharger has quantified the use of copper and minimum concentrations necessary to control the parasite and bacterial infestations and is actively pursuing the development of alternate treatments. The Discharger has also implemented changes in the treatment practices to minimize the concentration of copper in the discharge, such as treating only one raceway at a time. Therefore, considering these efforts and the time necessary to develop substitute treatments, this Order includes a compliance time schedule for compliance with the final effluent limit of five years. The final effluent limitations for copper become effective on **1 September 2009**. As this schedule is greater than one year, the Discharger shall submit annual progress reports on **1 July** each year until the Discharger achieves compliance with the final water quality based effluent limitation for copper, or eliminates the use of copper at the facility. The final effluent limitations shall become effective immediately if the Discharger fails to comply with or submit the information requested in Provision No. 7.

The SIP, Section 2.2.1, requires that if a compliance schedule is granted for a CTR or NTR constituent, the Regional Board shall establish interim limitations and dates for their achievement in the NPDES permit. In developing the interim limitation, where there are ten sampling data points or more, sampling and laboratory variability is accounted for by establishing interim limits that are based on normally distributed data where 99.9% of the data points will lie within 3.3 standard deviations of the mean. Where actual sampling shows an exceedance of the proposed 3.3-standard deviation interim limit, the maximum detected concentration is established as the interim limitation. When there are less than ten sampling data points available, the USEPA TSD recommends a coefficient of variation of 0.6 be utilized as representative of wastewater effluent sampling. The TSD recognizes that a minimum of ten data points are necessary to conduct a valid statistical analysis. The multipliers contained in Table 5-2 of the TSD are used to determine a maximum daily

limitation based on a long-term average objective. In this case, the long-term average objective is to maintain, at a minimum, the current plant performance level. Therefore, when there are less than ten sampling points for a constituent, interim limitations are based on 3.11 times the maximum observed sampling point to obtain the daily maximum interim limitation. Interim limitations are established when compliance with NTR- and CTR-based Effluent Limitations cannot be achieved by the existing discharge. Discharge of constituents in concentrations in excess of the final Effluent Limitations, but in compliance with the interim Effluent Limitations, can significantly degrade water quality and adversely affect the beneficial uses of the receiving stream on a long-term basis.

The Discharger has sampled the effluent during copper treatments during 2002 and 2003. Concentrations during treatment of a single raceway for 28 grab samples ranged from 1.2 to 287 ug/L. Actual concentrations measured during treatment vary with the flow and depend on when the sample was taken during the treatment. In accordance with the SIP a numeric interim effluent limitation for copper has been established in this Order based upon the current treatment practice of treating one raceway at a time and using the monitoring data submitted by the Discharger. Derivation of the interim copper limitation for data points greater than 10 is summarized below:

<b>INTERIM EFFLUENT LIMITATION</b>	
Number of Samples	28
Minimum Concentration (ug/L)	1.2
Maximum Concentration (ug/L)	287
Mean	47.05
Standard Deviation	78.53
Multiplier	3.3
Interim (MDEL)	306 (ug/L)

This Order contains an interim maximum daily effluent limitation of 306 ug/L. Final water quality based effluent limits for copper, as described in Attachment C of this Order, will become effective on **1 September 2009**. The interim effluent limitation for total copper supercedes the final effluent limitation provided the Discharger complies with the Tasks listed below.

- a. During the use of copper, the Discharger shall implement procedures and practices to minimize the concentration of copper in the discharge by using the minimum concentrations necessary for controlling the target organism and treating no more than one raceway at a time.
- b. The Discharger shall monitor copper during treatments in accordance with Monitoring and Reporting Program No. R5-2004-0121.
- c. By **1 July** each year the Discharger shall submit a progress report describing the efforts to eliminate the use or discharge of copper to receiving waters.

The final effluent limitations shall become effective immediately if the Discharger fails to comply with these requirements or submit the information requested.

### **Non-CTR Constituents**

#### **pH**

The Basin Plan contains water quality objectives for pH in the form of a range of acceptable pH values (measured in standard units). The Regional Board determined that the discharge from this Facility may cause, have the reasonable potential to cause, or contribute to an in-stream excursion of the numeric water quality objective for pH from the Basin Plan. In the previous Order, the Regional Board established effluent limitations in the form of acceptable range of pH between 6.5 and 8.5 for discharges to the Thermalito Afterbay. This pH limit is carried over to this permit.

#### ***Aquaculture Drugs and Chemicals***

Numeric water quality criteria, or Basin Plan numeric objectives currently are not available for most of the aquaculture drugs and chemicals used by the Discharger or proposed for use at this Facility. Therefore, the Regional Board used the narrative water quality objective for toxicity from the Basin Plan and applied the Policy for “Application of Water Quality Objectives” as a basis for determining “reasonable potential” for discharges of these drugs and chemicals. This objective states, in part: “All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.” The Basin Plan states that compliance with this objective will be determined by several factors, including biotoxicity tests of appropriate duration, or other analytical methods as specified by the Regional Board. (Biotoxicity testing involves measuring the toxic effects of an effluent on specified organisms according to nationally approved protocols). USEPA’s TSD specifies two toxicity measurement techniques that can be employed in effluent characterization; the first is Whole Effluent Toxicity (WET) testing, and the second is chemical-specific toxicity analyses. WET testing is used most appropriately when the toxic constituents in an effluent are not completely known; whereas chemical-specific analysis is more appropriately used when an effluent contains only one, or very few, well-known constituents. Due to the nature of operations and chemical treatments at most CAAP facilities in the Region, CAAP facility effluents generally contain only one or two known chemicals at any given a time. Therefore, the Regional Board is using a chemical-specific approach to determine “reasonable potential” for discharges of aquaculture drugs and chemicals from CAAP facilities. The California Department of Fish and Game Pesticide Investigation Unit (DFG Pesticide Unit) has initiated biotoxicity studies to determine the aquatic toxicity of certain aquaculture drugs and chemicals commonly used at their CAAP facilities in the Region.

#### ***Formalin as Formaldehyde***

Formalin (as a 37% formaldehyde solution) is not currently used but may be used by the Discharger at the Facility. Formalin is approved through FDA’s New Animal Drug Application (NADA) program for use in controlling external protozoa and monogenetic trematodes on fish, and for

controlling fungi of the family *Saprolegniaceae* in food-producing aquatic species (including trout and salmon). For control of other fungi, formalin may be used under an Investigational New Animal Drug (INAD) exemption. Formalin is used as a “drip” treatment to control fungus on fish eggs, or as a “flush” treatment in raceways of 1-8 hours in duration. Formalin may be applied in multiple treatments over the course of a given month, or may be applied in raceways for up to 8 hours at a time.

The State of California Department of Health Services (DHS) does not have a Maximum Containment Level (MCL) for formaldehyde, however the DHS historic Drinking Water Action Level is listed as 0.1 mg/L based on calculation by standard risk assessment methods, with a Modifying Factor = 10. The USEPA Integrated Risk Information System (IRIS) lists a reference dose of 1.4 mg/L as a drinking water level. There are no recommended criteria for formaldehyde for protection of aquatic life.

The DFG Pesticide Unit conducted biotoxicity studies to determine the aquatic toxicity of formaldehyde using *Pimephales promelas*, and *Ceriodaphnia dubia* (*C. dubia*) in accordance with the analytical methods specified in EPA600/4-91-002, *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*. These “short-term chronic tests” measure effects such as reduced growth of the organism, reduced reproduction rates, or lethality. Results were reported as a No Observed Effect Concentration (NOEC) and a Lowest Observed Effect Concentration (LOEC). The DFG Pesticide Unit also conducted acute toxicity tests using *C. dubia* in accordance with methods specified in EPA600/4-90/027, *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*. Acute toxicity test results typically are reported as the No Observed Adverse Effect Level (NOAEL), Lowest Observed Adverse Effect Level (LOAEL), and LC<sub>50</sub>.

Results of chronic toxicity tests submitted by the DFG Pesticide Unit indicated *C. dubia* was the most sensitive species with a 7-day No Observable Effect Concentration (NOEC) value of 1.3 mg/L formaldehyde for survival and reproduction. Acute toxicity tests with *C. dubia* showed a 96-hour NOAEL of 1.3 mg/L. A summary of the data submitted follows:

Species	7-day LC50 (mg/L)	LOEC (mg/L)	NOEC (mg/L)	LOAEL (mg/L)	NOAEL (mg/L)
<i>Ceriodaphnia dubia</i>	2.4	5.8 <sup>1</sup> 1.3 <sup>2</sup>	1.3 <sup>1</sup> <1.3 <sup>2</sup>	5.8	1.3
<i>Pimephales promelas</i>	23.3	9.09	2.28	--	--
<i>Selenastrum capricornutum</i>	<5.2	--	--	--	--

<sup>1</sup> Survival

<sup>2</sup> Reproduction

Since formalin treatments are utilized as a batch or flush treatment which result in discharges from three to eight hours, short-term tests were conducted with *C. dubia*, exposing the organisms for



2-hour and 8-hour periods, removing them from the chemical, and continuing the observation period for 7 days in clean water. The results were as follows:

Species	7-day LC50 (mg/L)	LOAEL (mg/L)	NOAEL (mg/L)
<i>C. dubia</i> —2-hour exposure	73.65	46.3	20.7
<i>C. dubia</i> —8-hour exposure	13.99	15.3	6.7

The Regional Board considered the results of both acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for formalin as formaldehyde were necessary. Results of chronic toxicity tests indicated *C. dubia* was the most sensitive species, with a 7-day NOEC value of 1.3 mg/L formaldehyde for survival and less than 1.3 mg/L for reproduction. Acute toxicity tests conducted using *C. dubia* showed a 96-hour NOAEL of 1.3 mg/L formaldehyde. Additional acute toxicity tests were conducted using an 8-hour exposure resulting in a 96-hour NOAEL concentration of 6.7 mg/L formaldehyde.

Based on typical application rates for Formalin and DFG information which indicates a potential to discharge up to 40 mg/L formaldehyde at the minimum dilution through the facility of 3.35mgd, the Regional Board determined that if Formalin is used at this Facility in the future, formaldehyde may be discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plan. Accordingly, this permit includes water quality-based effluent limitations for formaldehyde. Because the Facility is a flow-through facility without on-line settling, formaldehyde is expected to be present in the discharge for approximately the same duration as treatment, typically 8-hours or less. Therefore, the Regional Board is establishing a maximum daily effluent limitation of 6.7 mg/L with the requirement that the Facility monitor for formaldehyde at least once per month during formalin treatment. This limit is based on the observed 96-hour NOAEL with 8-hour exposure to formaldehyde. In addition, the Regional Board is establishing an average monthly effluent limitation of 0.65 mg/L formaldehyde based on the 96-hour NOAEL with 96-hours of exposure calculated using procedures from USEPA’s TSD. This limit will ensure protection of aquatic life from longer-term exposure to formaldehyde through successive treatments with formalin.

The Regional Board used USEPA’s TSD guidance to calculate the AMEL effluent limitation for formaldehyde as follows:

Assuming:

- No in-stream dilution allowance.
- Coefficient of Variation (CV) = 0.6 for the lognormal distribution of pollutant concentrations in effluent.

***Effluent Concentration Allowance based on NOAEL (acute toxicity) with no dilution allowance***

$$ECA_a = 1.3 \text{ mg/L}$$

***Effluent Concentration Allowance based on NOEC (chronic toxicity) with no dilution allowance***

$$ECA_c = 1.3 \text{ mg/L}$$

***Long Term Average concentration based on acute ECA***

$$LTA_a = 1.3 \text{ mg/L} \times 0.321 = 0.42 \text{ mg/L}$$

(where 0.321 = acute ECA multiplier at 99% occurrence probability and 99% confidence)

***Long Term Average concentration based on chronic ECA***

$$LTA_c = 1.3 \text{ mg/L} \times 0.527 = 0.69 \text{ mg/L}$$

(where 0.527 = chronic ECA multiplier at 99% occurrence probability and 99% confidence)

***Most Limiting LTA concentration***

$$LTA = 0.4173 \text{ mg/L}$$

***Average Monthly Effluent Limit***

$$AMEL = LTA \times 1.55$$

(where 1.55 = AMEL multiplier at 95% occurrence probability, 99% confidence, and  $n = 4$ )

$$AMEL = 0.42 \text{ mg/L} \times 1.55 = \mathbf{0.65 \text{ mg/L as formaldehyde}}$$

The previous Order for the Facility has a daily maximum effluent limit of 0.03 mg/L, which is more stringent than the effluent limitations included in this permit. There is no information in the previous Order or fact sheet to support the 0.03 mg/L limit and Regional Board staff have not found information supporting the limit. Based on the above new information on 8-hour and 96-hour exposure to formaldehyde, which was not available at the time of issuance of the previous Order, less stringent effluent limitations are appropriate. Consequently, the formaldehyde limitations in this permit are consistent with federal and State antidegradation and antibacksliding requirements.

***Sodium Chloride***

Sodium chloride (salt) is used regularly at the Facility as a fish-cleansing agent to control the spread of fish disease in the raceways, and to reduce stress amongst the confined fish population. The Discharger reports using up to 400 lbs of salt per raceway treatment, with an estimated 2-hour

elimination period from the raceway. Based on the minimum discharge flow through the Facility of 3.35 mgd (5.2 cfs), the maximum concentration of salt in a two hour discharge to the Thermalito Afterbay from one raceway is calculated to be 170.8 (mg/L). FDA considers sodium chloride an unapproved new animal drug of low regulatory priority (LRP drug) for use in aquaculture. Consequently, FDA is unlikely to take regulatory action if an appropriate grade is used, good management practices are followed, and local environmental requirements are met. There are no numeric water quality objectives for conductivity, TDS, or chloride in the NTR, CTR, or Basin Plan for Coleman Canal or Battle Creek. The Basin Plan does contain a narrative objective for chemical constituents that states, in part, “Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses.” Agricultural irrigation is a beneficial use of the receiving water. *Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1* (R.S. Ayers and D.W. Westcot, Rome, 1985), recommends that the conductivity level in waters used for agricultural irrigation not exceed 700  $\mu\text{mhos/cm}$  (Agricultural Water Quality Goal) because it will reduce crop yield for sensitive plants. The Agricultural Water Quality Goal for TDS is 450 mg/L. USEPA’s recommended ambient water quality criteria for chloride for the protection of freshwater aquatic life are 230 mg/l as a one-hour average, and 860 mg/l as a four-day average. The Agricultural Water Quality Goal for chloride is 106 mg/L. The discharge of sodium chloride from the Facility at the application rates described by the Discharger will not cause, have the reasonable potential to cause, or contribute to an in-stream excursion of applicable water quality criteria or objectives. To assure compliance with the receiving water objective for specific conductance of 150  $\mu\text{mhos/cm}$  (90<sup>th</sup> percentile) applicable to the Feather River, and tributaries to the Feather River, this permit requires electrical conductivity monitoring in the Thermalito Afterbay when salt is used to clean raceways at the Facility. If monitoring indicates the discharge causes the receiving water objective to be exceeded, this permit may be reopened to modify the effluent limitation.

### ***Acetic acid***

Acetic acid is used to dissolve the copper sulfate during the treatment of the raceways. The influent water at the Facility has a high mineral content, and is relatively hard (70 mg/L as  $\text{CaCO}_3$ ) therefore the copper sulfate crystals do not dissolve well in the raceways. The Discharger reports using a ratio of two-thirds acetic acid to the total amount of copper sulfate crystals used. Acetic acid may also potentially be used by the Discharger as a “flush” treatment in raceways for the control of external parasites on fish. The Basin Plan contains water quality objectives for pH in the form of a range of acceptable pH values (measured in standard units). Since acetic acid will lower the pH of the water the Regional Board has included an effluent limit for pH. Monthly use of acetic must be reported as specified in the attached Monitoring and Reporting Program.

### ***Hydrogen peroxide***

Hydrogen peroxide (35 %  $\text{H}_2\text{O}_2$ ) is not currently used but may be used by the Discharger in the future as a short-term immersion bath treatment in holding tanks, or as a raceway flush treatment. The Discharger reports that the 35% hydrogen peroxide solution would be used as a one-hour treatment of

100 mg/L in only one raceway at a time. The Discharger calculated that at the maximum use of a 35% hydrogen peroxide solution at 100 mg/L for one-hour, and at the minimum discharge flow through the Facility of 3.35 mgd (5.2 cfs), the maximum concentration of hydrogen peroxide in a 3-hour flush discharge to the Thermalito Afterbay is calculated to be 16.14 mg/L as H<sub>2</sub>O<sub>2</sub>. This concentration, however, does not account for any breakdown of hydrogen peroxide within the Facility. FDA considers hydrogen peroxide to be an LRP drug when used to control fungi on fish at all life stages, including eggs. Hydrogen peroxide may also be used under an INAD exemption to control bacterial gill disease in various fish, fungal infections, external bacterial infections, and external parasites. Hydrogen peroxide is a strong oxidizer that breaks down into water and oxygen; however, it exhibits toxicity to aquatic life during the oxidation process.

The Regional Board considered the results of acute aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for hydrogen peroxide were necessary in this Permit. Results of a single acute toxicity test using *C. dubia* showed a 96-hour NOAEL of 1.3 mg/L. There is no toxicity information available for shorter exposure periods. Exposure to hydrogen peroxide may be short-term because the facility only has four raceways and no settling basins that could increase exposure times. The DFG Pesticide Unit is proposing to conduct additional toxicity testing on hydrogen peroxide to determine NOAEL concentrations for shorter exposure periods. Since there is limited short- and long-term toxicity information available at this time and no information regarding actual discharge concentrations of hydrogen peroxide, this permit does not include water quality-based effluent limitations for hydrogen peroxide. However, use and monitoring of hydrogen peroxide must be reported as specified in the attached Monitoring and Reporting Program and results of additional toxicity tests must be submitted as specified in Provision No. 5. The Regional Board will review this information, and other information as it becomes available and this permit may be reopened to establish effluent limits based on additional use and toxicity information.

### ***Potassium permanganate***

Potassium permanganate (also known by the trade name of Cairox<sup>®</sup>) is rarely used at the Facility. However, on occasion it is necessary to use Potassium Permanganate to control gill disease as a 2-hour flush treatment in the raceways. A total of 54 oz. (0.42 gals.) were used in March and April of 2001, during an outbreak of Infectious Hematopoietic Necrosis at the Facility. The Discharger has calculated that at the maximum use of potassium permanganate of 20 oz. (567 grams) per raceway, and at the minimum discharge flow through the Facility of 3.35 mgd (5.2 cfs), the maximum concentration of potassium permanganate in the discharge to the Thermalito Afterbay is calculated to be 0.53 mg/L. If two raceways are treated simultaneously, for a total use of 40 oz. (1,134 grams) of potassium permanganate, the maximum concentration of potassium permanganate in the discharge to the Thermalito Afterbay is calculated to be 1.07 mg/L. This concentration, however, does not account for any breakdown of hydrogen peroxide within the Facility. Potassium permanganate has a low estimated lifetime in the environment, being readily converted by oxidizable materials to insoluble manganese dioxide (MNO<sub>2</sub>). In non-reducing and non-acidic environments, MNO<sub>2</sub> is insoluble and has a very low bioaccumulative potential.

Potassium permanganate is not approved for use in aquaculture under FDA's NADA program and should therefore be used in accordance with an INAD exemption granted by FDA. Based only on the minimum dilution through the facility of 3.35 mgd and a 2-hour flush treatment using 20 ounces in one raceway at a time, the estimated maximum concentration of potassium permanganate in the discharge would be 0.53 mg/L. This concentration, however, does not account for any breakdown of potassium permanganate within the Facility. Because potassium permanganate is typically applied in a single, short-term treatment, or as a series of closely-spaced, short-term treatments, the Regional Board considered the results of acute aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for potassium permanganate were necessary in this Permit. Results of a single acute toxicity test using *C. dubia* showed a 96-hour NOAEL of 0.25 mg/L for potassium permanganate. Exposure to potassium permanganate would be short-term because the facility only has four raceways and no settling basins that could increase exposure times. There is no toxicity information available for shorter exposure periods. The DFG Pesticide Unit is proposing to conduct additional toxicity testing on potassium permanganate to determine NOAEL concentrations for shorter exposure periods. Since there is limited toxicity information available for short- and long-term exposure and no information regarding actual discharge concentrations of potassium permanganate, this permit does not include water quality-based effluent limitations for potassium permanganate. However, use and monitoring of potassium permanganate must be reported as specified in the attached Monitoring and Reporting Program and results of additional toxicity tests must be submitted as specified in Provision No. 5. The Regional Board will review this information, and other information as it becomes available and this permit may be reopened to establish effluent limits based on additional use and toxicity information.

### ***Chloramine-T***

Chloramine-T is not currently used may be used by the Discharger in the future as a possible replacement of copper and formalin. Chloramine-T is available for use in accordance with an INAD exemption by FDA. The Discharger reports that the therapeutic treatment consists of a 10-20 mg/L dose for a 3-hour exposure. Chloramine-T breaks down into para-toluenesulfonamide (p-TSA) and unlike other chlorine based disinfectants does not form harmful chlorinated compounds. The Discharger has not conducted biotoxicity tests using Chloramine-T, however results of toxicity testing from other sources were submitted and showed a 96-hour LC<sub>50</sub> for rainbow trout of 2.8 mg/L. The 48-hour NOEC for *Daphnia magna* was reported as 1.8 mg/L. Exposure to Chloramine-T would be short-term because the facility only has four raceways and no settling basins that could increase exposure times. There is no toxicity information available for shorter exposure periods. The DFG Pesticide Unit is proposing to conduct additional toxicity testing on Chloramine-T to determine NOAEL concentrations for shorter exposure periods. Since there is limited toxicity information available for short- and long-term exposure and no information regarding actual discharge concentrations of Chloramine-T, this permit does not include water quality-based effluent limitations for Chloramine-T. However, use and monitoring of Chloramine-T must be reported as specified in the attached Monitoring and Reporting Program and results of additional toxicity tests must be

submitted as specified in Provision No. 5. The Regional Board will review this information, and other information as it becomes available and this permit may be reopened to establish effluent limits based on additional use and toxicity information.

### ***PVP Iodine***

PVP Iodine (also known by the brand name Iodophor) is used in short-term “flush” treatments as a fish egg disinfectant up to 30 minutes in duration. PVP Iodine solution is not currently used at the Facility, as no fish eggs are incubated or treated at the Facility. The Discharger does not propose use of PVP Iodine solution at the Facility in the future.

### ***MS-222 and Aqui-S<sup>®</sup>***

Anesthetics are not currently used at the Facility. However, the Discharger has requested to be able to use an anesthetic known as Tricaine methansulfonate, commonly known as MS-222 (with trade names of Fiquel<sup>®</sup> or Tricaine-S<sup>®</sup>). MS-222 has been approved by FDA for use as an anesthetic for Salmonidae. The Discharger proposes to use MS-222 in a “tagging trailer” for three to six weeks at the Facility. The Discharger reports that the maximum use of MS-222 would be 10 grams per day during spawning operations. In the future, the Discharger may use the anesthetic Aqui-S<sup>®</sup>. Aqui-S<sup>®</sup> is a water dispersible liquid anesthetic for fin fish, crustacea and shell fish and is used in the US under an INAD exemption. The Regional Board does not have specific toxicity information for MS-222 or Aqui-S<sup>®</sup> or estimates of potential discharge concentrations of MS-222 and Aqui-S<sup>®</sup> at this Facility. The Discharger is not proposing to discharge these chemicals to waters of the United States or waters of the State, but plans to use other means of disposal. Consequently, this Order does not include water quality-based effluent limitations for these anesthetics, but use and means of disposal of these chemicals must be reported as specified in the attached Monitoring and Reporting Program. Also, this Order includes a provision requiring that all aquaculture drugs and chemicals not discharged to receiving waters be disposed of in an environmentally safe manner, according to label guidelines, Material Safety Data Sheet guidelines and BMPs. Any other form of disposal requires approval from the Executive Officer.

### ***Oxytetracycline***

Oxytetracycline is not currently used but may potentially be used by the Discharger. Oxytetracycline, also known by the brand name Terramycin<sup>®</sup>, is an antibiotic approved through FDA’s NADA program for use in controlling ulcer disease, furunculosis, bacterial hemorrhagic septicemia, and pseudomonas disease in salmonids. Oxytetracycline is most commonly used at CAAP facilities as a feed additive. However, oxytetracycline may also be used as an extra-label use under a veterinarian’s prescription in an immersion bath of approximately six to eight hours in duration. Because oxytetracycline may be applied in an immersion bath for up to eight hours at a time, the Regional Board considered the results of acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for oxytetracycline used in an immersion bath treatment were necessary in this Permit. Results of acute toxicity tests using

*C. dubia* showed a 96-hour NOAEL of 40.4 mg/L. Results of chronic toxicity tests using *C. dubia* showed a 7-day NOEC for reproduction of 48 mg/L. The information available to the Regional Board regarding discharges of oxytetracycline indicates that it may be discharged at similar facilities in the Region at levels up to a maximum concentration of 0.05 mg/L, well below the lowest NOEC and NOAEL. Therefore, at this time, the Regional Board determined that oxytetracycline, when used in feed or in an immersion bath treatment, is not discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plans. Accordingly, this Permit does not include an effluent limitation for oxytetracycline. However, monthly use of oxytetracycline must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this permit may be reopened to establish effluent limits based on additional use and toxicity information.

### ***Penicillin G***

Penicillin G is not currently used, but may potentially may be used by the Discharger. Penicillin G, also known as Pen-G, is an antibiotic used in a six to eight hour immersion bath treatment to control acute disease outbreaks. Penicillin G is not approved under FDA's NADA program and its' extra-label use in aquaculture requires a veterinarian's prescription. Due to the length of treatment time (up to eight hours), the Regional Board considered the results of acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for Penicillin G were necessary in this Permit. Results of acute toxicity tests using *C. dubia* showed a 96-hour NOAEL of 890 mg/L. Results of 7-day chronic toxicity testing using *Pimephales promelas* showed 7-day NOEC for survival of 350 mg/L. The information available to the Regional Board regarding discharges of Penicillin G indicates that it may be discharged at similar facilities in the Region at levels up to a maximum concentration of 8 mg/L, well below the lowest NOEC and NOAEL. Therefore, at this time, the Regional Board determined that Penicillin G, when used in an immersion bath treatment, is not discharged from CAAP facilities in the Region at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plan. Accordingly, this Permit does not include effluent limitations for Penicillin G. However, monthly use of Penicillin G must be reported as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information, and other information as it becomes available, and this permit may be reopened to establish effluent limits based on additional use and toxicity information.

### ***Antibiotics in Feed Formulations and Injected***

Amoxicillin, erythromycin, florfenicol, and Romet-30<sup>®</sup> are not currently used but may potentially be used by the Discharger. Amoxicillin is injected into fish to control acute disease outbreaks through a veterinarian's prescription for extra-label use. Erythromycin (injected or used in feed formulations) and florfenicol (used in feed formulations) are antibiotics used to control acute disease outbreaks and must be used under an INAD exemption or a veterinarian's prescription for extra-label use. Romet-30<sup>®</sup>, also known by the trade name Sulfadimethoxine-oremtroprim, is an antibiotic used in

feed formulations and is approved for use in aquaculture through FDA's NADA program for control of furunculosis in salmonids. In the NPDES General Permit for Aquaculture Facilities in Idaho (Idaho General Permit), USEPA Region 10 distinguishes between antibiotics applied in feed formulations and antibiotics applied in immersion baths. The Idaho General Permit concludes that drugs or chemicals administered via feed, and ingested by fish, pose little threat to aquatic life or beneficial uses because a majority of the drug is utilized by the fish, though some literature suggests otherwise. As stated in the Idaho General Permit, "USEPA believes that disease control drugs and other chemicals provided for ingestion by fish do not pose a risk of harm or degradation to aquatic life or other beneficial uses." The Regional Board determined that amoxicillin (when injected into fish), erythromycin (when injected into fish or used as a feed additive), florfenicol and Romet-30<sup>®</sup> (when used as feed additives) are used in a manner that reduces the likelihood of direct discharge of antibiotics to waters of the United States or waters of the State, particularly when Dischargers implement BMPs as required by this Permit. Therefore, the Regional Board determined that amoxicillin, florfenicol, and Romet 30<sup>®</sup> are not discharged from CAAP facilities in the Region at levels that cause, have the reasonable potential to cause, or contribute to an excursion of a narrative water quality objective for toxicity from the Basin Plan. Accordingly, this Permit does not include water quality-based effluent limitations for these substances; however, this Permit does require monthly monitoring and reporting of these substances as specified in the attached Monitoring and Reporting Program. The Regional Board will review this information and this permit may be reopened to establish effluent limits based on additional use and toxicity information.

### ***Vibrio Vaccine and Enteric Redmouth Bacertin***

To treat enteric redmouth disease, the Discharger administers enteric redmouth bacterin. Enteric redmouth (or yersiniosis) bacertins are formulated from inactivated *Yersinia ruckeri* bacteria and may be used as an immersion or vaccine to help protect salmonid species from enteric redmouth disease caused by *Yersinia ruckeri*. These bacertins stimulate the fish's immune system to produce protective antibodies. The Discharger has indicated that it may use a vibrio vaccine in the future. Vibrio vaccine may be used as an immersion or an injectable vaccine and helps protect salmonid species from vibriosis disease caused by *Vibrio anguillarum* serotype I and *Vibrio ordalii*. Vibrio vaccine stimulates the fish's immune system to produce protective antibodies, helping the animal defend itself against vibriosis. These veterinary biologics are licensed for use by the US Department of Agriculture's (USDA's) Center for Veterinary Biologics. Veterinarians should be consulted before beginning an immunization program. According to USDA, most biologics leave no chemical residues in animals and most disease organisms do not develop resistance to the immune response by a veterinary biologic. Based upon available information regarding the use of these substances at CAAP facilities, the Regional Board does not believe that vibrio vaccine or enteric redmouth bacertins, when used according to label and veterinarian instructions, are discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of Basin Plan narrative water quality objectives for toxicity. Accordingly, this Order does not include water quality-based effluent limitations for these substances; however, use of these substances must be reported as specified in the attached Monitoring and Reporting Program. In the future, as additional information becomes available regarding the use or toxicity of these biologics,



the Regional Board will re-evaluate whether the discharge of any of these substances to receiving waters may cause, have the reasonable potential to cause, or contribute to an excursion of the Basin Plan objectives for toxicity and, if necessary, re-open this Order to include numeric effluent limitations.

### **BASIS FOR SOLID WASTE DISPOSAL PROVISIONS**

Solid waste disposal provisions in this Permit are based on the requirements of CCR Title 27 and prevention of unauthorized discharge of solid wastes into waters of the United States or waters of the State.

### **BASIS FOR BEST MANAGEMENT PRACTICES PROVISIONS**

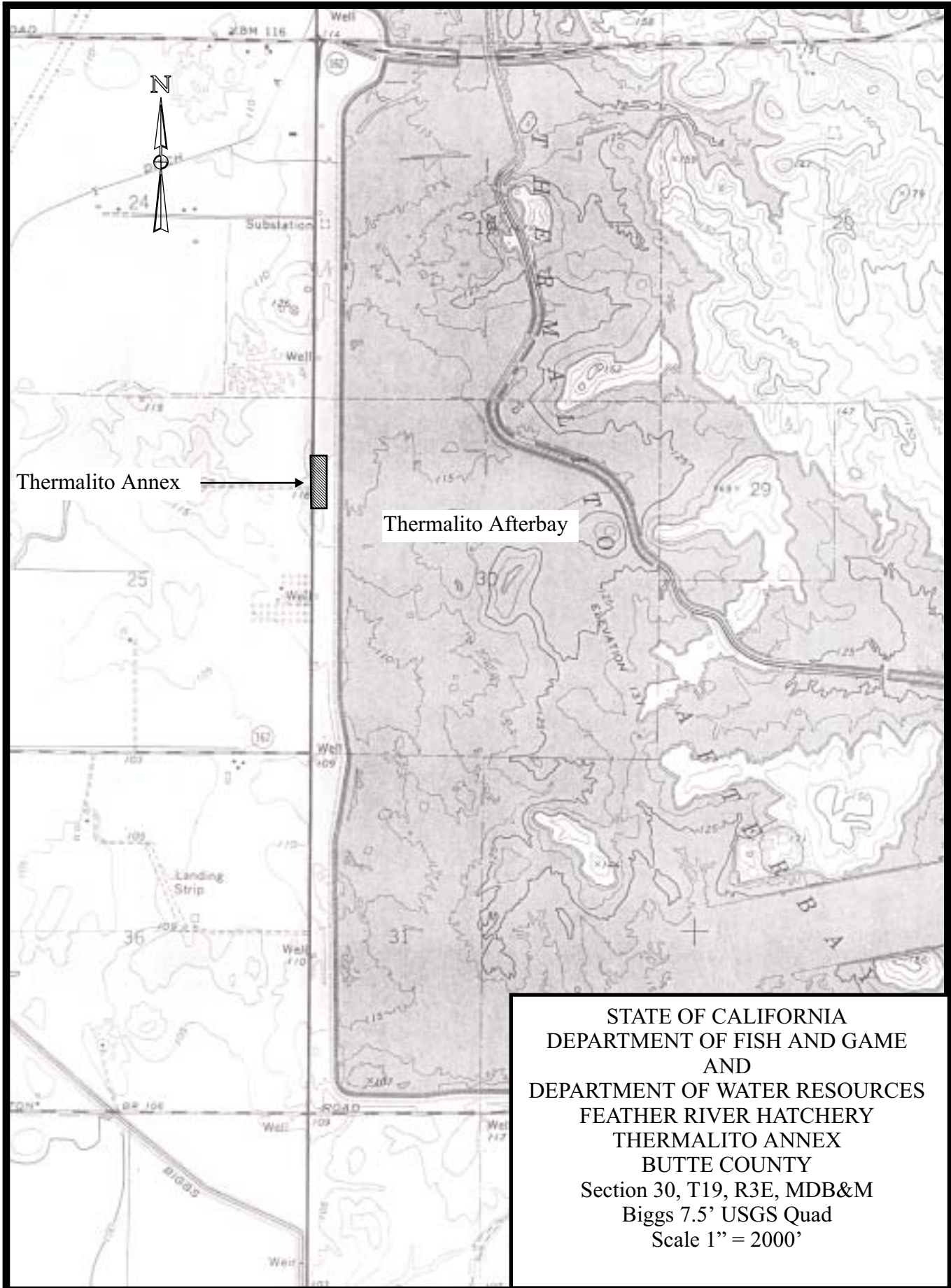
Best Management Practices Plan requirements are established based on requirements in Effluent Limitations Guidelines and New Source Performance Standards for the Concentrated Aquatic Animal Production Point Source Category at 40 CFR Part 451.

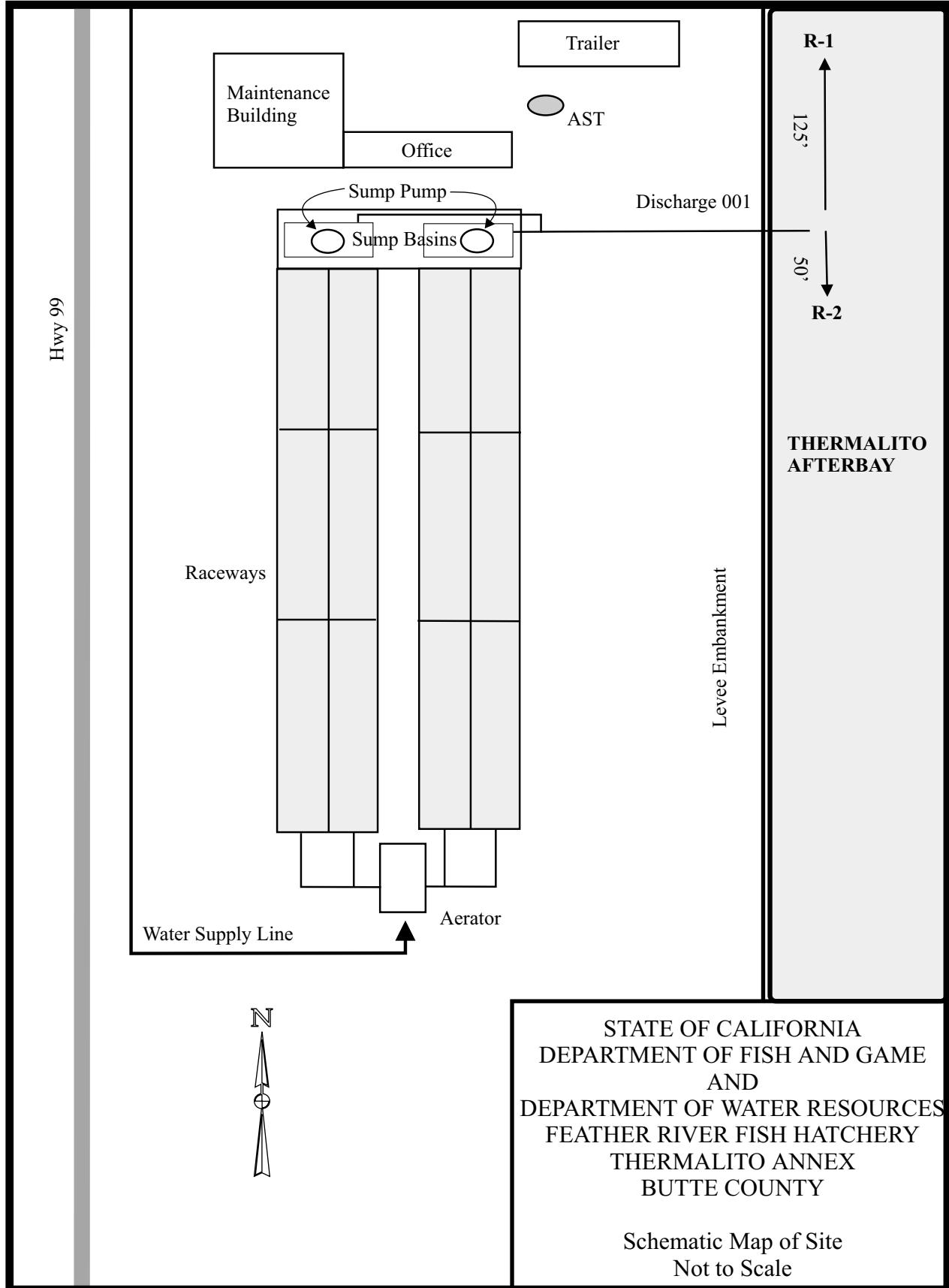
### **BASIS FOR RECEIVING WATER LIMITATIONS**

Receiving water limitations are interpretations of water quality objectives from the Basin Plans. Receiving water limitations in this Permit are included to ensure protection of beneficial uses of receiving waters. A receiving water condition not in conformance with a limitation is not necessarily a violation of the Permit. However, the Regional Board may require an investigation to determine cause and culpability prior to asserting that a violation has occurred.

### **MONITORING AND REPORTING PROGRAM**

Receiving water monitoring requirements are based on the Basin Plan and authorized by California Water Code §13267 and §13383. Receiving water monitoring requirements are standard requirements in almost all NPDES permits issued by the Regional Board. Upstream receiving water monitoring station R1 is located 125 feet above the discharge pipe outfall along the shoreline of the Thermalito Afterbay. Receiving water monitoring station R-2 is located 50 feet below the pipeline outfall along the shoreline of the Thermalito Afterbay.





<b>SIP Section 1.4 Maximum Daily Effluent Limitations (MDEL) as Total Recoverable Copper using CTR Water Quality Hardness-Dependent Values of the CMC (Criterion Maximum Concentration<sup>1</sup>)</b>			
<b>Upstream Receiving Water Hardness (mg/L as CaCO<sub>3</sub>)</b>	<b>CMC<sub>Dissolved</sub> 1-hr Average<sup>1</sup> (µg/L)</b>	<b>LTA<sub>acute</sub>-Long Term Average (Acute)<sup>2</sup> (µg/L total recoverable)</b>	<b>MDEL<sup>3</sup> (µg/L total recoverable)</b>
<20	Must Calculate	Must Calculate	Must Calculate
21	3.1	1.03	<b>3.2</b>
22	3.3	1.09	<b>3.4</b>
23	3.4	1.12	<b>3.5</b>
24	3.5	1.16	<b>3.6</b>
25	3.6	1.22	<b>3.8</b>
26	3.7	1.25	<b>3.9</b>
27	3.9	1.32	<b>4.1</b>
28	4.0	1.35	<b>4.2</b>
29	4.2	1.41	<b>4.4</b>
30	4.3	1.44	<b>4.5</b>
31	4.4	1.48	<b>4.6</b>
32	4.6	1.54	<b>4.8</b>
33	4.7	1.57	<b>4.9</b>
34	4.9	1.64	<b>5.1</b>
35	5.0	1.67	<b>5.2</b>
36	5.1	1.70	<b>5.3</b>
37	5.3	1.77	<b>5.5</b>
38	5.4	1.80	<b>5.6</b>
39	5.6	1.86	<b>5.8</b>
40	5.7	1.89	<b>5.9</b>
41	5.8	1.93	<b>6.0</b>
42	6.0	1.99	<b>6.2</b>
43	6.1	2.02	<b>6.3</b>
44	6.2	2.09	<b>6.5</b>
45	6.3	2.12	<b>6.6</b>
46	6.4	2.15	<b>6.7</b>
47	6.6	2.21	<b>6.9</b>
48	6.7	2.25	<b>7.0</b>
49	6.8	2.28	<b>7.1</b>
50	7.0	2.34	<b>7.3</b>
51	7.1	2.38	<b>7.4</b>
52	7.3	2.44	<b>7.6</b>
53	7.4	2.47	<b>7.7</b>
54	7.5	2.50	<b>7.8</b>
55	7.7	2.57	<b>8.0</b>
56	7.8	2.60	<b>8.1</b>
57	7.9	2.63	<b>8.2</b>
58	8.1	2.70	<b>8.4</b>
59	8.2	2.73	<b>8.5</b>
60	8.4	2.79	<b>8.7</b>
65	8.9	2.99	<b>9.3</b>
70	9.6	3.21	<b>10.0</b>
75	10.3	3.43	<b>10.7</b>
>85	Must Calculate	Must Calculate	Must Calculate

<sup>1</sup>  $CMC_{Dissolved} (1\text{-hr average}) = 0.960 \times \exp^{(0.9422)(\ln \text{hardness}) - 1.700}$

<sup>2</sup>  $LTA_{acute} = ECA \times 0.321$  (where  $ECA = CMC_{Dissolved} / 0.960$ )

<sup>3</sup>  $MDEL = LTA_{acute} \times 3.11$