CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0123

NPDES NO. CA0004201

WASTE DISCHARGE REQUIREMENTS FOR U.S. DEPARTMENT OF INTERIOR FISH AND WILDLIFE SERVICE COLEMAN FISH HATCHERY SHASTA COUNTY

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

1. The U.S. Department of Interior, Fish and Wildlife Service (designated hereafter as the Discharger) submitted a Report of Waste Discharge, dated 15 August 2001, and applied for a permit renewal to discharge wastewater under the National Pollution Discharge Elimination System (NPDES) for the Coleman Fish Hatchery (Facility) located near Anderson. The permit renewal application was deemed complete on 28 August 2001.

2. The Facility is owned and operated by the Discharger. In operation since 1943, the Facility was established as part of a plan to mitigate for the loss of historical spawning areas where access for salmon and steelhead trout was blocked by the construction of Shasta Sam on the Sacramento River. Battle Creek was chosen because of its abundance of cold springs that ensure a relatively high flow and stable base flow throughout the year. These conditions offer drought resistance and offer natural habitat conditions conducive to the recovery of anadromous salmonid species.

3. The discharge is presently governed by Order No. 96-235 (NPDES No. CA0004201), adopted by the Regional Board on 20 September 1996.

4. The Facility is located on Assessor's Parcel Nos. 057-540-03 and 057-540-04, along the north bank of Battle Creek, a tributary of the Sacramento River, in Section 1, T29N, R3W, MDB&M, as shown on Attachment A, which is incorporated herein and made part of this Order. The Facility lies on the eastern edge of the Ash Creek Hydrologic Subarea (HSA) No. 507.21, as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986. The continuous flow-through water from the Facility is pumped from three separate intake locations along Battle Creek and re-introduced back into Battle Creek at four different discharge locations.

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

6. The 75-acre Facility consists of an administration building, five residences, a maintenance building, a spawning building, a hatchery building, an ozone treatment facility, filtration and settling basins, 58 raceways, seven adult holding ponds, a fish ladder, a pollution abatement pond, an evaporation/percolation pond, and various water conveyance canals. The facilities are shown on Attachment B, which is incorporated herein and made part of this Order.

7. A total of approximately 14 million fall-run chinook, late fall-run chinook, and steelhead are reared at the Facility. Salmon and steelhead fry hatched at the Facility are either released into Battle Creek or trucked to the Delta when they reach the smolt stage. Fry remain at the Facility for between 5 and 12 months. The Facility operates year-round with peak water use in during the spawning season (September to January) and least water use after the release of the fall-run chinook (May to June). According to the Report of Waste Discharge, 204,762 pounds of chinook salmon and 150,000 pounds of steelhead are raised annually at the Facility. Maximum feeding occurs in the month of April, with the application of 53,413 pounds of feed.

8. Three intake structures (Intake #1, #2, and #3) supply the Facility with water from Battle Creek. To remove silt, sediment and bacterial that impact fish reproduction and health, the water supply is treated with a combination of settling, filtration and/or ozonation. The ozone treatment facility treats between 10,000 to 30,000 gallons per minute (gpm) of intake water (depending on water demand), and has a maximum design capacity of 30,000 gpm.

9. Facility wastewaters are discharged to four discharge locations, as discussed below:

   - **Discharge 001.** In the event of power loss to the Facility, the Untreated Water Canal requires a minimum baseline amount of water to circulate through the Facility to prevent stagnant conditions. Overspill water from Intake #3 is routed through the Untreated Water Canal and discharged to Battle Creek at Discharge 001. Since no wastes are introduced into the waste stream from this process, the water quality of this discharge is similar to the water quality of Battle Creek. Flow rates from Discharge 001 have not been quantified.

   - **Discharge 002.** During times when chemicals are not being used, single pass flow-through waters from the raceways, and rarely the hatchery building, are discharged at Discharge 002. However, because oxytetracycline is added to feed, and fish are fed in the raceways, oxytetracycline has the potential to be introduced to the Discharge 002 waste stream. Maximum daily and 30-day average flow rates at Discharge 002 are 33.5 million gallons per day (mgd) and 31.9 mgd, respectively.

- **Discharge 003.** During any chemical usage (for cleaning or medication) at the Facility, water is routed to the pollution abatement pond prior to discharge to Discharge 001. The only exception is the use of oxytetracycline as discussed above. The 2-acre unlined, earthen embankment abatement pond has a retention time of approximately 9 to 10 days Maximum daily and 30-day average flow rates at Discharge 003 are 3.3 mgd and 2.3 mgd, respectively

- **Discharge 004.** Water from the spawning building adult holding ponds is discharged to Battle Creek through the fish ladder at Discharge 004. The source of water in the adult holding ponds is overspill water from the Untreated Water Canal and continuous flow through water from the raceways and the pre-release pond. The pre-release pond is currently used to hold steelhead trout after spawning. Mature fish swim upstream through the fish ladder against the discharge flow and are collected in the adult holding ponds to be harvested for eggs and milt. No feed or medication is applied in the adult holding ponds. The fish ladder is only used during October to February during spawning. The Discharger estimates approximately 5,000 gpm of untreated water and 3,000 gpm of raceway/pre-release pond water is routed to the adult spawning ponds. Water from the raceways and pre-release ponds, which is of higher quality than the untreated water, is used only when no medication or cleaning had been conducted in the raceways/pre-release pond. Flow rates from Discharge 004 have not been quantified.

Additionally, wash water from the spawning building, which generally contains eggs and blood, are pumped to a ½-acre evaporation/percolation pond on the east side of the Facility. This pond is used during the spawning season. Carbon dioxide, used as an anesthetic, is also bubbled through the sorting bins in the spawning building.

10. Potable water is supplied by an on-site domestic well and treated with ultra-violet disinfection. Domestic wastewater generated at the fish-rearing portion of the Facility is discharged to a septic tank/leachfield system. Domestic wastewater generated at the five residences is discharged to each of their own septic tanks. All five tanks collectively discharge to a single leachfield system.

11. The Facility has four aboveground petroleum storage tanks (AST). Two diesel tanks, one gasoline tank, and one waste oil tank. All tanks have double walls, with containment. An outside vendor periodically collects waste oil from equipment oil changes. The Discharger is in the process of acquiring an additional generator, which will require a third diesel AST. A Spill Prevention Control and Countermeasure Plan was prepared by a registered engineer in 1999; it will be updated after the installation of the third diesel AST.

12. 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.

13. 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 formalin (as a 37% formaldehyde, methanol-free solution) to medicate fingerlings and eggs; PVP iodine solution to disinfect eggs prior to incubation, sodium chloride (salt) to reduce osmotic stress, oxytetracycline (Terramycin®) an antibiotic to treat disease; hypochlorite and Hyamine-1622 to disinfect and clean; MS-222 and carbon dioxide to anesthetize fish during spawning, handling and tagging; and enteric redmouth bactrin as a vaccine. Chloramine-T has not been used since 1997; however, should another outbreak of bacterial gill disease occur, Chloramine-T would be used again. Additionally, the Discharger does not plan to use Hyamine-1622 in the future. Chemicals that are not currently used at the Facility, but may possibly be used in the future include hydrogen peroxide, potassium permanganate, and acetic acid. Antibiotics such as Penicillin G, Amoxicillin trihydrate, Romet-30® (Sulfadimethoxine-ormetroprim), erythromycin, and Florfenicol. Sodium bicarbonate and Aqui-S® may be used to anesthetize fish. Vaccines, such as Vibrio vaccine may also be used. The Discharger does not use copper sulfate and does not propose its use in the future.

APPLICABLE REGULATIONS, POLICIES, AND PLANS

14. 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.

15. 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 coliform, 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.

16. 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.

17. 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.

18. 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.

19. 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.

20. 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

21. The Basin Plan at page II-2.00 states: "Existing and potential beneficial uses which currently apply to surface waters of the basins are presented in Figure II-1 and Table II-1. The beneficial uses of Battle Creek as identified in Table II-1 of the Basin Plan are agricultural supply irrigation (AGR), power (POW), 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).

22. 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

23. 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.

TECHNOLOGY-BASED EFFLUENT LIMITATIONS

24. 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. 96-235. 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. 96-235 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. 96-235 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

25. 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)].

26. 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).

27. 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 29 March 2001, 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 collected was representative of typical operating conditions. Copper is not used at the Facility and will not be used in the future. Based on CTR results, previous information collected, and Facility operations, the Regional Board finds that the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the CTR objectives for priority pollutants. Effluent limitations for priority pollutants have not been included in this Order.

28. 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 pH, chlorine 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.

NON-CTR EFFLUENT LIMITATIONS

29. 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 and 8.5 for discharges to the Battle Creek.

30. 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. The results of these studies are, in

part, used to determine reasonable potential for aquaculture drugs and chemicals for this Facility.

31. Sodium chloride (salt) is used regularly at the Facility to reduce stress amongst fish during the movement of fish from the hatchery building to the raceways. The Discharger reports using up to 25 lbs of salt during each truckload transfer, with an estimated 30-minute elimination period from the raceway. Based on the minimum discharge flow through the Facility of 500 gallons per minute (slow flow rate during movement of smaller fish), the maximum concentration of salt is calculated to be 198 mg/L. In addition, daily during a three-week period in March or April, the Discharger monitors fish passage through the upstream fish ladder located at the barrier weir on Battle Creek. Fish are placed in tanks and anesthetized with carbon dioxide. The tanks are 500 gallons in size and contain hatchery-origin waters. To mitigate for osmotically induced stress, 25 pounds of salt are added to each tank. When the fish are released into Battle Creek, the contents of the tank, including the salt, are also released. 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. Monitoring of conductivity and chloride is required and monthly use of sodium chloride must be reported as specified in the Monitoring and Reporting Program.

32. Formalin (as a 37% formaldehyde solution) is used by the Discharger at the Facility to medicate both eggs and fingerlings. Eggs are medicated 2 to 3 times weekly to prevent excessive loss due to fungus. Egg medication requires one to two hours. Fingerlings are medicated in response to infection by protozoans. When used as fingerling medication, either inside the hatchery building troughs or outside raceways, a static medication is used to minimize the volume of formalin. All effluent water from the hatchery building is routed to the pollution abatement pond, as is effluent from any raceway medicated with formalin. 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 *Saprolegniacae* 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.

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). Aquatic habitat is a beneficial use of Battle Creek. 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 Lethal Concentration at 50 percent mortality (LC_{50}). 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 with *C. dubia* were conducted using an 8-hour exposure resulting in a 96-hour NOAEL concentration of 6.7 mg/L formaldehyde. Formalin applied to one set of the in-series raceways at a rate of 165 mg/L (61 mg/L formaldehyde) for one-hour would have to be diluted or degraded in the pollution abatement pond and by flow from the other raceways in order to be discharged at a level below the NOAEL of 1.3 mg/L. Based on typical application rates provided by the Discharger, the Regional Board determined that 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 Order includes water quality-based effluent limitations for formaldehyde. Exposure to formaldehyde in the receiving water as a result of discharges from the Facility may be long-term because of potential application procedures (e.g., successive raceway treatments, drip treatments for eggs). Also, because of retention of the effluent in the pollution abatement pond, exposure times could exceed treatment times. Therefore, an average monthly effluent limitation of 0.65 mg/L and a maximum daily effluent limitation of 1.3 mg/L are calculated based on the 96-hour NOAEL value and using the procedure in USEPA's TSD for calculating water quality-based effluent limitations. These effluent limitations will ensure protection of aquatic life against effects from exposure to formaldehyde in the Discharge. Previous Order No. 96-235 included a less stringent daily maximum limitation for formaldehyde of 5.0 mg/L based on a USEPA Health Advisory for acute 10-day exposure.

33. High-test hypochlorite (HTH) is used in the sand-anthracite beds to remove silt and restore the efficiency of the filter beds. The Discharger performs a 48 to 96-hour static bath, and discharges the water to the pollution abatement pond. There are no numeric water quality objectives for chorine in the NTR, CTR, or Basin Plans. The Basin Plans contain a narrative toxicity water quality objective that 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." USEPA's recommended acute and chronic Ambient Water Quality Criteria for Protection of Aquatic Life for chlorine are 19 µg/l and 11 µg/l respectively. Based on this information, the Regional Board determined that chlorine is currently, or may potentially be discharged at levels that cause, have the reasonable potential to cause, or contribute to an in-stream excursion above the narrative water quality objective for toxicity in the Basin Plan. Applying the Basin Plan "Policy for Application of Water Quality Objectives", the numeric standard that implements the narrative objective is USEPA's recommended criteria for chlorine. Accordingly, this establishes a water quality-based effluent limitation for total residual chlorine. The Regional Board determined that a maximum daily effluent limitation of 18 ug/l was necessary for controlling total residual chlorine. The Regional Board used the procedures in the TSD to calculate this effluent limitation.

34. Acetic acid may 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.

35. Hydrogen peroxide (35 % H_20_2) is not currently used but may be used in the future for the control of external parasites at the hatchery. 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. Use and monitoring of hydrogen peroxide 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.

36. Potassium permanganate is not currently used but may be used in the future as a flush treatment to control external parasites and bacteria. 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. 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. Use and monitoring of potassium permanganate 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.

37. Chloramine-T is not currently used by the Discharger but may be used in the future during outbreaks of bacterial gill disease. Chloramine-T is available for use in accordance with an INAD exemption by FDA. 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_{50} for rainbow trout of 2.8 mg/L. The 48-hour NOEC for *Daphnia magna* was reported as 1.8 mg/L. There is no toxicity information available for shorter exposure periods. Since Chloramine-T has not been used at the Facility since 1997 and there is 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. 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.

38. PVP iodine, also known by the brand name Iodophor®, is currently used at the Facility to disinfect equipment and eggs prior to incubation. Disinfection of eggs requires 40 gallons during the months of October through February. Equipment disinfection occurs throughout the year and requires 10 gallons per month. Wastewaters from these processes are routed to the pollution abatement pond. The FDA considers PVP iodine to be an LRP drug for use in aquaculture. At most CAAP facilities PVP iodine is typically applied in short-term flush treatments of less than 1-hour. 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 PVP iodine were necessary in this Permit. Results of acute toxicity tests using *C. dubia* showed a 96-hour NOAEL of 0.86 mg/L. There is no toxicity information available for shorter exposure periods. The DFG Pesticide Unit is proposing to conduct additional toxicity testing on PVP Iodine 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 PVP Iodine, this permit does not include water quality-based effluent limitations for PVP Iodine. However, use and monitoring of PVP Iodine must be reported

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 toxicity information.

39. MS-222 is used at the Facility as an anesthetic when handling fingerlings. MS-222, also known as Tricaine methansulfonate (with trade names of Finquel® or Tricaine-S®). MS-222 has been approved through the INAD process to be used as an anesthetic during spawning or tagging operations. In 2001, the Discharger used a total of 4.75 pounds of MS-222. Approximately 4.5 pounds were used from October through February when 2.4 million chinook salmon and steelhead were being tagged. The remaining 0.25 pounds were used throughout the year on a monthly basis during inventory and when obtaining weight estimates as a basis for calculating daily feeding rates. During use of MS-222, wastewaters are discharged to the pollution abatement pond, the evaporation/percolation pond, or containerized and disposed of off-site. In the future, the Discharger may use the anesthetic Aqui-S®, a water dispersible liquid anesthetic for fin fish, crustacea and shell fish, used under an INAD exemption. The Regional Board does not have specific toxicity information for MS-222 or Aqui-S® or estimates of potential discharge concentrations of MS-222 and Aqui-S® at this Facility. 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.

The Discharger also uses carbon dioxide gas as an anesthetic during the monitoring of fish through the upstream fish ladder located at the barrier weir and in the spawning building prior to spawning. FDA considers carbon dioxide gas an LRP drug for use in aquaculture. During monitoring, it is bubbled into holding tanks, which are later discharged directly into Battle Creek. During spawning, carbon dioxide is bubbled into the sorting bins in the spawning building, and routed with the other wastewaters to the evaporation/percolation pond. Given the small volume of carbon dioxide used during the monitoring process, the short time frame, and the high flow rates in Battle Creek, there is no information to suggest that the use of carbon dioxide as an anesthetic has a reasonable potential to impact water quality.

40. Oxytetracycline is used by the Discharger to medicate steelhead and late-fall chinook for columnarius disease. Oxytetracycline, also known by the brand name Terramycin®, is an antibiotic approved through FDA's NADA program for use in controlling ulcer disease, furunculosis, bacterial hemorrhagic septicemia, and pseudomonas disease in salmonids. As at most CAAP facilities, oxytetracycline is applied as a feed additive when used at the Facility. 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. The Regional Board has 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 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 is discharged at levels 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.

41. Penicillin G is not currently used by the Discharger but may be used in the future as a six hour bath for the control of bacterial infections. 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, 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 if it is used it would be discharged at levels 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, would not 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 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.

42. Amoxycillin, erythromycin, florfenicol, and Romet-30® are not currently used but may potentially be used by the Discharger. Amoxycillin 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®, 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 amoxycillin (when injected into fish), erythromycin (when injected into fish or used as a feed additive), florfenicol and Romet-30® (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 amoxycillin, florfenicol and Romet 30® 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.

43. To treat enteric redmouth disease, the Discharger administers enteric redmouth bacterin. Enteric redmouth (or yersiniosis) bacterins 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.

OTHER CONSIDERATIONS

44. 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. R5-2004-0123 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.

45. 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.

46. 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.

47. 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.

48. 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.

49. 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.

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

51. 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. 96-235 is rescinded and that the U.S. Department of Interior, Fish and Wildlife Service, 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, 9, and 10 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, including from the evaporation/percolation pond, 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.

5. Unless approved by the Executive Officer, the discharge of wastewater, other than from spawning operations, to the evaporation/percolation pond is 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 65 mgd.

3. Direct discharges to surface waters shall not exceed the following limits:

Constituent	Units	Average Monthly Limit	Maximum Daily Limit
Suspended Solids[1] (net)	mg/L	5.0	15.0
Settleable Solids	ml/L	0.1	0.2
Total Residual Chlorine[1]	mg/L	--	0.018
Formaldehyde	mg/L	0.65	1.3

[1] Effluent limitations for total suspended solids are net values (Net TSS concentration =Effluent TSS concentration less Influent TSS concentration).

[2] The daily maximum value for total residual chlorine shall be considered non-compliant with the effluent limits only if it exceeds the effluent limitation and the reported minimum level (ML). The highest ML that the Discharger's laboratory must achieve for calibration purposes is 0.1 mg/L.

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.

3. The domestic sewage discharge shall remain underground at all times, and there shall be no direct discharge to surface waters or surface water drainage courses.

4. Objectionable odors originating at this Facility shall not be perceivable beyond the limits of the Discharger's property.

5. Freeboard in the Evaporation/Percolation Pond shall never be less than two feet (measured vertically from the lowest point of the berm).

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 Battle Creek

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 Battle Creek:

1. Concentrations of dissolved oxygen to fall below 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. Oils, greases, waxes, or other materials to form a visible film or coating on the water surface or on the stream bottom.

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

4. Aesthetically undesirable discoloration.

5. Fungi, slimes, or other objectionable growths.

6. 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.

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

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

9. Increase the normal ambient temperature of waters by more than 5ºF (3ºC).

10. 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.

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

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

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

14. Biostimulatory substances to be present in the water column which promote aquatic growths that cause nuisance or adversely affect beneficial uses.

15. 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. R5-2004-0123, 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. This Order authorizes the discharge of sodium chloride, acetic acid, potassium permanganate, hydrogen peroxide, Chloramine-T, formalin, PVP Iodine, Oxytetracycline, Romet-30®, Florfenicol, Penicillin G, amoxicillin, erythromycin, enteric redmouth bacterin, vibrio vaccine, MS-222, carbon dioxide, and Aqui-S®, 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.

4. Prior to use of Chloramine-T, the Discharger shall submit all available MSDS and toxicity information regarding Chloramine-T. The Regional Board will review this information and this permit may be reopened to establish effluent limits for Chloramine-T based on additional toxicity testing and other available information.

5. 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.

6. The Discharger shall comply with the standards contained in the Health and Safety Code, Chapter 6.67, Aboveground Storage of Petroleum.

7. 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.

8. 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.

9. 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.

10. 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.

11. 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. CA0004201

MONITORING AND REPORTING PROGRAM NO. R5-2004-0123

FOR
U.S. DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE
COLEMAN FISH HATCHERY
SHASTA 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 (INTAKE #1, #2, AND #3)

A sampling station shall be established and located where representative samples of the raw water supply from each intake structure can be obtained. Samples shall be collected at approximately the same time as effluent samples. Influent monitoring shall include at least the following from Intake #1, Intake #2, and Intake #3:

Constituent	Unit	Type of Sample	Sampling Frequency
Influent flow	cfs	meter[1]	Daily
Suspended Solids	mg/L	8-hour composite	1/ month

[1] Flow estimates acceptable until influent flow measurement devices are installed, as discussed in the Findings.

EFFLUENT MONITORING (DISCHARGE 001, 002, 003, AND 004)

Effluent samples shall be collected from the Discharge 001, 002, 003, and 004. Effluent samples shall 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. When monitoring Discharge 003, effluent samples shall be collected following raceway cleaning or administration of drug or chemical treatments such that samples are representative of the volume and quality associated pollutants present in the discharge. Time of collection of samples shall be recorded. Effluent monitoring shall include the following:

Constituent	Units	Type of Sample	Discharge Location	Sampling Frequency
Effluent Flow	gpd	Calibrated meter, weir, or other approved method[1]	All	Weekly
Total suspended solids (TSS)	mg/L	8-hour composite	All	1/ month
Net TSS **(effluent minus influent)**	mg/L	Net calculation	All	1/ month
Settleable solids	mL/L	Grab	All	1/ month
pH	units	Grab	All	1 / month
Specific Conductance @ 25°C [2]	umhos/cm	Grab	All	1 / month
Chloride [2]	mg/L	Grab	002 and 003	1/ month during use
Formaldehyde [3]	mg/L	Grab	002 and 003	1/ month during use
Chlorine [4]	mg/L	Grab	002 and 003	1/ month during use
Hydrogen peroxide [5]	mg/L	Grab	002 and 003	1/ month during use
Potassium permanganate [5]	mg/L	Grab	002 and 003	1/ month during use
Chloramine-T [5]	mg/L	Grab	002 and 003	1/ month during use
PVP Iodine [5]	mg/L	Grab	002 and 003	1/ month during use

[1] Flow estimates acceptable until discharge flow measurement devices are installed, as discussed in the findings.
[2] In months when sodium chloride is being used for treatment, specific conductance and chloride shall be measured.
[3] In months when formalin is added to the waters of the Facility, formaldehyde concentration shall be measured during formalin use.
[4] In months when hypochlorite (HTH) is used. The highest acceptable minimum level that the Discharger's laboratory must achieve for calibration purposes for total residual chlorine is 0.1 mg/L
[5] The analytical method used for hydrogen peroxide, potassium permanganate, Chloramine-T and PVP Iodine, and 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.

RECEIVING WATER MONITORING IN BATTLE CREEK

Receiving water samples shall be collected monthly when fish are being held at the Facility, and when there is a direct discharge from Discharge 002 and 003 to Battle Creek. All receiving water samples shall be grab samples collected at a depth of 6 to 12 inches below the surface, 5 feet from shore at the locations described below. Receiving water monitoring shall include at least the following:

R-1 Located 25 feet upstream from the point where Discharge 001 flows into Battle Creek (See Attachment B of this Order).

R-2 Located 25 feet downstream from the point where Discharge 002 flows into Battle Creek (See Attachment B of this Order).

R-3 Located 25 feet downstream from the point where Discharge 003 flows into Battle Creek (See Attachment B of this Order).

Constituent	Unit	Station	Sampling Frequency
DURING NORMAL HATCHERY OPERATIONS			
pH	units	All	Monthly
Temperature	ºC	All	Monthly
Dissolved Oxygen	mg/L	All	Monthly
Turbidity	NTU	All	Monthly
Specific Conductance[1]	µmhos/cm	All	Monthly
DURING MONITORING AT BARRIER WEIR ON BATTLE CREEK			
Specific Conductance[1]	µmhos/cm	R-1 and R-3	Weekly

[1] When sodium chloride is added to waters of the Facility or receiving waters.

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-3. 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 Battle Creek 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 Battle Creek.

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 = (treatment concentration) x (flow in treatment area) ÷ (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 mg/L x 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 reopen this Order 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 renewal 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
- Arsenic
- Beryllium
- Cadmium
- Chromium (III)
- Chromium (IV)
- Copper
- Lead
- Mercury
- Nickel
- Selenium
- Silver
- Thallium
- Zinc

Metals shall be analyzed by the U.S. EPA 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 Spectromtry (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 California Department of Health Services. 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.

SEPTIC TANK MONITORING AND INSPECTIONS

Septic tank maintenance inspections (including tank sludge level measurement) shall be performed at least once per year. Information concerning inspections and maintenance activities (including, but not limited to, pumping, replacement, and repairs) shall be included in the monitoring reports submitted to the Board.

LEACHFIELD MONITORING

The Discharger shall inspect the leachfield areas weekly and submit the results in the monitoring report. Monitoring shall include any observations of seeps, erosion, field saturation, ponding liquid, the presence of nuisance, and other field conditions.

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 prohibitions, specifications, or 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)

MEB:

INFORMATION SHEET

ORDER NO. R5-2004-0123
U.S. DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE
COLEMAN FISH HATCHERY
SHASTA COUNTY

FACILITY DESCRIPTION

The Coleman Fish Hatchery (Facility) is located on Assessor's Parcel Nos. 057-540-03 and 057-540-04, along the north bank of Battle Creek, a tributary of the Sacramento River, in Section 1, T29N, R3W, MDB&M, as shown on Attachment A. The Facility is owned and operated by the U.S. Department of Interior, Fish and Wildlife Services. The Facility lies on the eastern edge of the Ash Creek Hydrologic Subarea (HSA) No. 507.21, as depicted on interagency hydrologic maps prepared by the Department of Water Resources in August 1986. The continuous flow-through water from the Facility is discharged to Battle Creek at four separate locations. These discharges are presently governed by Order No. 96-235 (NPDES No. CA0004201, adopted by the Regional Board on 20 September 1996.

In operation since 1943, the Facility was established as part of the salvage plan to mitigate for the loss of historical spawning areas where access for salmon and steelhead trout was blocked by the construction of Shasta Sam on the Sacramento River. A total of approximately 14 million fall-run chinook, late fall-run chinook, and steelhead are reared at the Facility. Salmon and steelhead fry hatched at the Facility are either released into Battle Creek or trucked to the Delta when they reached the smolt stage. Fry remain at the Facility for between 5 and 12 months. The Facility operates year-round with peak water use in during the spawning season (September to January) and least water use after the release of the fall-run chinook (May to June). Specific information regarding fish rearing and release is summarized below:

Fish raised at the Coleman Fish Hatchery Facility

	Fall-run Chinook Salmon	**Late fall-run Chinook Salmon**	**Steelhead Trout**
Time period when eggs are taken	Oct-Nov	Jan-Feb	Dec-Feb
Approximate duration at Hatchery	5 months	1 year	1 year
Time period when smolt are released to Battle Creek	Late April	Jan	Jan
Approximate number of fish	12 million	750,000	600,000
Time period when smolt are trucked and released at Delta	--	Nov-Jan	--
Number of fish released	--	250,000	--

According to the Report of Waste Discharge, 204,762 pounds of chinook and 150,000 pounds of steelhead are produced annually at the Facility. Maximum feeding occurs in April with the feed application during that month of 53,413 pounds.

The 75-acre Facility consists of an administration building, five residences, a maintenance building, a spawning building, a hatchery building, an ozone treatment facility, filtration and settling basins, 58 raceways, seven adult holding ponds, a fish ladder, a pollution abatement pond, and various water conveyance canals. A Facility map is presented in Attachment B. Domestic waste from the residences and operations buildings is treated by six septic tanks that discharge to two leachfields. Three intake structures supply the Facility with water from Battle Creek. To remove silt, sediment and bacterial that severely impact fish reproduction and health, the water supply is treated. Depending on the use, supply water is treated with at least one of the following:

- **Settling basins.** Water from Intake #3 is treated in two settling basins and then is either used as overflow, routed to the spawning building adult holding ponds, or is routed to the sand filtration basins. Each settling basin has a retention time of approximately 1½ to 2 hours, a capacity of 1.2 million gallons, and a flow rate of 10,000 gallons per minute (gpm). Sedimentation is removed from the basins annually, generally in the summer.

- **Sand/anthracite filters.** Water from Intakes #1 and 2, as well as some from the settling basins, is treated with filtration prior to ozone disinfection. Sand/anthracite filtration improves the clarity of water taken from Battle Creek prior to ozonation. Additionally, it makes ozone a more effective disinfectant and reduces the amount of ozone required. There are four sand filter basins at the Facility with a total retention time of 15 to 30 minutes and a flow rate of 45,000 gpm. They are backwash and cleaned with hypochlorite (chlorine) once or twice a year. The hypochlorite is retained for 48 to 96 hours prior to discharge to the pollution abatement pond.

- **Ozone treatment facility.** Ozone treatment kills all viral, bacterial, and protozoan organisms that could infect fish being reared in the hatchery. The ozone remains in contact with the water for 15 minutes and is then removed before the water enters the raceways. The entire reprocess is automated and computer controlled. The ozone treatment facility treats between 10,000 to 30,000 gpm of intake water (depending on water demand), and has a maximum design capacity of 30,000 gpm.

Water use throughout the Facility is summarized in the table below:

Water Usage and Discharge
at the Coleman Fish Hatchery Facility

Uses	Chemicals Used	Discharge Locations
Operational Overspill	None	Discharge 001
Adult Holding Ponds	None	Discharge 004
Hatchery Building	Formalin, salt, iodophor, oxytetracycline, Hyamine-1622	Discharge 003
Raceways	Oxytetracycline, Formalin, salt, MS-222, feed	Discharge 002, 003, and 004
Spawning Building	Carbon dioxide and possibly Iodophor	Evaporation/Percolation Pond

Uses	Chemicals Used	Discharge Locations
Pre-release pond	Feed	002 and 004
Hatchery Building or in immersion bath prior to transfer to raceways.	Enteric Redmouth Bacterin	Percolation/Evaporation Pond
Barrier Weir on Battle Creek	Carbon dioxide	Directly into Battle Creek

Facility wastewaters are discharged to four discharge locations, as discussed below:

- **Discharge 001.** In the event of power loss to the Facility, the Untreated Water Canal requires a minimum baseline amount of water to circulate through the Facility to prevent stagnant conditions. Overspill water from Intake #3 is routed through the Untreated Water Canal and discharged to Battle Creek at Discharge 001. Since no wastes are introduced into the waste stream from this process, the water quality of this discharge is similar to the water quality of Battle Creek. Flow rates from Discharge 001 have not been quantified.

- **Discharge 002.** During times when chemicals are not being used, single pass flow through waters from the raceways, and rarely the hatchery building, are discharged at Discharge 002. However, because oxytetracycline is added to feed, and fish are fed in the raceways, oxytetracycline has the potential to be introduced to the Discharge 002 waste stream. Maximum daily and 30-day average flow rates at Discharge 002 are 33.5 million gallons per day (mgd) and 31.9 mgd, respectively.

- **Discharge 003.** During any chemical usage (for cleaning or medication) at the Facility, water is routed to the pollution abatement pond prior to discharge to Discharge 001. The only exception is the use of oxytetracycline as discussed above. The 2.5-acre unlined, earthen embankment abatement pond has a retention time of approximately 9 to 10 days. It was built in the mid-1980's and has not yet required removal of deposits. Maximum daily and 30-day average flow rates at Discharge 003 are 3.3 mgd and 2.3 mgd, respectively

- **Discharge 004.** Water from the spawning building adult holding ponds is discharged to Battle Creek through the fish ladder at Discharge 004. The source of water in the adult holding ponds is overspill water from the Untreated Water Canal and continuous flow through water from the raceways and the pre-release pond. The pre-release pond is currently used to hold steelhead trout after spawning. Mature fish swim upstream through the fish ladder against the discharge flow and are collected in the adult holding ponds to be harvested for eggs and milt. No feed or medication is applied in the adult holding ponds. The fish ladder is only used during October to February during spawning. The Discharger estimates approximately 5,000 gpm of untreated water and 3,000 gpm of raceway/pre-release pond water is routed to the adult spawning ponds. Water from the raceways and pre-release ponds, which is of higher quality than the untreated water, is used only when no medication or cleaning had been conducted in the raceways/pre-release pond. Flow rates from Discharge 004 have not been quantified.

Additionally, wash water from the spawning building, which generally contains eggs and blood, are pumped to a ½-acre evaporation/percolation pond on the east side of the Facility. Carbon dioxide, used as an anesthetic, is also bubbled through the sorting bins in the spawning building. This pond is used during the spawning season.

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 management practices dependably remove fish hatchery wastewater constituents to concentrations which are below the level at which the beneficial uses of surface and/or groundwater are adversely affected. For example, intake water is treated with sedimentation, filtration and/or ozonation, which removes bacteria, viruses, parasites, and silt prior to use within the Facility. Additionally during cleaning operations or medication application, wastewaters are routed to the pollution abatement pond. During all other times, when cleaning chemicals or medications are not used, hatchery waste water is routed to Discharge 002. As discussed above, the only exception is the use of oxytetracycline, which is mixed with fish feed and applied in the raceways. However fish feed is applied at measured rates to reduce the potential for excess loading.

Chemicals are used at the Facility to prevent disease, treat fish for parasites, fungi, and bacteria, and to clean rearing raceways. Chemicals currently used are summarized in the table below:

Chemical	**Amount Used (2002)**	**Months of Use**	**Application**
Formalin	178.8 gal	Oct to July (peak Oct to Dec)	Medicate eggs and fingerlings to prevent fungus in eggs and infection in fingerlings. Applied in hatchery building.
Iodophor	160 gal	year round (peak Oct to Feb)	Disinfect eggs prior to incubation, and to disinfect raceway cleaning equipment (brooms and boots)
Enteric Redmouth Bacterin (vaccine)	5 to 10 gal	April to June	Vaccinate juvenile late-fall Chinook and steelhead.
Sodium Chloride	2,200 pounds in hatchery raceways; 525 pounds in Battle Creek	Jan to July	Reduce stress during medicating or moving fry or fingerlings. Applied in the raceways and directly into Battle Creek.
Oxytetracycline	5.6 pounds	May to July	Medicate during outbreak of columnaris disease in steelhead and late fall chinook salmon. Applied in raceways with fish feed.
Hypochlorite (chlorine)	300 pounds	May and June	Restore filtration ability of sand-anthracite beds. Annual 48 to 96 hour static bath removes bacteria and algae. Water is discharged to the pollution abatement pond.

Chemical	Amount Used (2002)	Months of Use	Application
Hyamine-1622	1 gallon	April-June	Disinfect equipment in hatchery building. The Discharger does not plan to use Hyamine-1622 in the future.
MS-222	4.75 gallons	year round (peak Oct to Feb)	Anesthetic when handling fingerlings during tagging and inventory. Applied in the raceways.
Chloramine-T	none used since 1997.	April to Aug	Control bacterial gill disease. Would be used during outbreak. Static application in raceways to minimize volume of chemicals required.
Carbon Dioxide	____	March to April and during spawning	As an anesthetic during monitoring activities at barrier weir on Battle Creek and in the spawning building during spawning.

Domestic wastewater generated at the fish-rearing portion of the Facility is discharged to a septic tank/leachfield system. Additionally, each of the five residences has its own septic tank. All five tanks collectively discharge to a single leachfield system.

The Facility has four aboveground petroleum storage tanks (AST). Two hold diesel, one holds gasoline, and one holds waste oil. All tanks have double walls, with tertiary containment. The diesel powers the tractor, lawn mowers, and backup generators; the gasoline powers the forklifts and on-station scooters. Waste oil from equipment oil changes is periodically collected by an outside vendor. The Discharger is in the process of acquiring an additional generator, which will require a third diesel AST. A Spill Prevention Control and Countermeasure Plan (SPCC) was prepared by a registered engineer in 1999. The SPCC Plan will be updated in 2004 after the installation of the third diesel AST.

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 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 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 coliform, 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 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 gonadrotropin (Chlorulun®), used for spawning;
2. Oxytetracycline (Terramycin®), an antibiotic;
3. Sulfadimethoxine-ormetoprim (Florfenicol-30®), an antibiotic;
4. Tricain methanesulfonate (MS-222, Finquel® and Tricaine-S), an anesthetic;
5. Formalin (formalin-F®, Paracide F® and PARASITE-S®), 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 Florfenicol-30®, 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 INAD exemption. The 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

Battle Creek, a drought-resistant and spring-fed system, discharges to the Sacramento River approximately 6 miles downstream from the Facility. Battle Creek is important to aquatic species such as winter-run and spring-run chinook and steelhead trout that are dependant on cool water stream habitats. There are currently eight power generation dams located upstream of the Facility, on the north and south forks of Battle Creek. Led by the U.S. Department of the Interior, Bureau of Reclamation, an Environmental Impact Statement/Environmental Impact Report is currently being prepared to evaluate salmon and steelhead habitat restoration including the removal of some of the existing dams.

The beneficial uses of Battle Creek as identified in Table II-1 of the Basin Plan are agricultural supply irrigation (AGR), power (POW), 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).

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 objectives 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. 96-235. 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 settlable 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 29 March 2001, 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 collected was representative of typical operating conditions. Copper is not used at the Facility and will not be used in the future. Based on CTR results, previous information collected, and Facility operations, the Regional Board finds that the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the CTR objectives for priority pollutants. Effluent limitations for priority pollutants have not been 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 pH, chlorine 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.

NON-CTR EFFLUENT LIMITATIONS

pH and Acetic Acid

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 previous Order No. 96-235, the Regional Board established effluent limitations in the form of acceptable range of pH between 6.5 and 8.5 for discharges to the Battle Creek. This pH limit is carried over to this permit.

Although not currently used at the Facility, the Discharger may use acetic acid in the future to control external parasites. Acetic acid is added to the top of a raceway. The taste and odor threshold for acetic acid in drinking water is 97 mg/L. Although it is not expected that the discharge would exceed this threshold, if used, the addition of acetic acid may lower the pH of the water. As established in this Order and the former Order, the acceptable range of pH is between 6.5 and 8.5 standard units for discharges to Battle Creek. The Discharger must notify the Regional Board prior to the use of acetic acid. Upon the request of the Regional Board, the Discharger shall perform additional monitoring.

Aquaculture Drugs and Chemicals

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 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. The results of these studies are, in part, used to determine reasonable potential for aquaculture drugs and chemicals for this Facility.

Sodium Chloride

Sodium chloride (salt) is used regularly at the Facility to reduce stress amongst fish during the movement of fish from the hatchery building to the raceways. The Discharger reports using up to 25 lbs of salt during each truckload transfer, with an estimated 30-minute elimination period from the raceway. Based on the minimum discharge flow through the Facility of 500 gallons per minute (slow flow rate during movement of smaller fish), the maximum concentration of salt is calculated to be 198 mg/L. Additionally, daily during a three-week period in March or April, the Discharger monitors fish passage through the upstream fish ladder located at the barrier weir on Battle Creek. Fish are placed in tanks and anesthetized with carbon dioxide. The tanks are 500 gallons in size and contain hatchery-origin waters. To mitigate for osmotically-induced stress, 25 pounds of salt (sodium chloride) are added to each tank. When the fish are released into Battle Creek, the contents of the tank, including the salt, are also released.

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 µmhos/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. Monitoring of conductivity and chloride is required and monthly use of sodium chloride must be reported as specified in the Monitoring and Reporting Program.

Formalin as formaldehyde

Formalin (as a 37% formaldehyde solution) is currently used by the Discharger. Formalin is approved through FDA's NADA program for use in controlling external protozoa and monogenetic trematodes on fish, and for controlling fungi of the family *Saprolegniacae* in food-producing aquatic species (including trout and salmon). For control of other fungi, formalin may be used under an 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.

At the Facility, formalin is used to medicate both eggs and fingerlings. Eggs are medicated 2 to 3 times weekly to prevent excessive loss due to fungus. Fingerlings are medicated in response to infection by protozoans. The months of greatest formalin usage are October to December when medicating eggs. Egg medication requires one to two hours. When used as fingerling medication, either inside the hatchery building troughs or outside raceways, a static medication is used to minimize the volume of formalin. All effluent water from the hatchery building is routed to the pollution abatement pond, as is effluent from any raceway medicated with formalin.

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 Lethal Concentration at 50 percent mortality (LC_{50}).

Results of chronic toxicity tests submitted by the DFG Pesticide Unit indicated *C. dubia* was the most sensitive species with a 7-day 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)
C. dubia	2.4	5.8[1] 1.3[2]	1.3[1] <1.3[2]	5.8	1.3
Pimephales promelas	23.3	9.09	2.28	--	--
Selenastrum capricornutum	<5.2	--	--	--	--

[1] Survival
[2] 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)
C. dubia—2-hour exposure	73.65	46.3	20.7
C. dubia—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.

Formalin applied to one set of the in-series raceways at a rate of 165 mg/L (61 mg/L formaldehyde) for one-hour would have to be diluted or degraded in the pollution abatement pond and by flow from the other raceways in order to be discharged at a level below the NOAEL of 1.3 mg/L. 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. Exposure to formaldehyde may be long-term because of potential application procedures (e.g., successive raceway treatments). Also, because of retention of effluent in settling ponds, exposure times could exceed treatment times. Therefore, an average monthly effluent limitation of 0.65 mg/L and a maximum daily effluent limit of 1.3 mg/L are calculated based on the 96-hour NOAEL value and using the procedure in USEPA's TSD for calculating water quality-based effluent limits. These effluent limits will ensure protection of aquatic life against effects from exposure to formaldehyde the Discharge. Previous Order No. 96-235 includes a less stringent daily maximum limitation for formaldehyde of 5 mg/L based on a USEPA Health Advisory for acute 10-day exposure.

Accordingly, this permit includes water quality-based effluent limitations for formaldehyde. The Regional Board is establishing a maximum daily effluent limitation of 1.3 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. 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 MDEL and AMEL effluent limitations 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

$ECA_a = 1.3$ mg/L

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

ECA_c = 1.3 mg/L

Long Term Average concentration based on acute ECA

LTA_a = 1.3 mg/L X 0.321 = 0.42 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 mg/L X 0.527 = 0.69 mg/L
(where 0.527 = chronic ECA multiplier at 99% occurrence probability and 99% confidence)

Most Limiting LTA concentration

LTA = 0.4173 mg/L

Average Monthly Effluent Limit

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

AMEL = 0.42 mg/L X 1.55 = **0.65 mg/L as formaldehyde**

Maximum Daily Effluent Limit

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

MDEL = 0.42 mg/L X 3.11 = **1.3 mg/L as formaldehyde**

Total Residual Chlorine (Hypochlorite)

High-test hypochlorite (HTH) is used at the Facility to control algae growth, to kill bacteria in the sand-anthracite beds. An annual 48 to 96 hour static bath with hypochlorite is required to remove organic matter from the beds to improve filtration ability. There are no numeric water quality objectives for chorine in the NTR, CTR, or Basin Plans. However, based on Facility information, the Regional Board determined that chlorine is may potentially be discharged from the Facility at levels that cause, have the reasonable potential to cause, or contribute to an in-stream excursion above the narrative water quality objective for toxicity in the Basin Plans. Applying the Basin Plan "Policy for Application of Water Quality Objectives", the numeric standard that implements the

narrative objective is USEPA's recommended criteria for chlorine. USEPA's recommended acute (1-hour average) and chronic (4-day average) Ambient Water Quality Criteria for Protection of Aquatic Life for chlorine are 19 ug/l and 11 ug/l respectively. Accordingly, this Permit establishes a water quality-based effluent limitation for total residual chlorine. The Regional Board determined that a maximum daily effluent limitation of 18 µg/l was necessary for controlling total residual chlorine discharges from CAAP facilities in the Region. The Regional Board used the procedures in USEPA's TSD to calculate this effluent limitation 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 (ECA) based on acute criterion with no dilution allowance

ECA_a = 19 µg/l

ECA based on chronic criterion with no dilution allowance

ECA_c = 11 µg/l

Long Term Average (LTA) concentration based on acute ECA

LTA_a = 19 µg/l X 0.321 = 6.099 µg/l
(where 0.321 = acute ECA multiplier at 99% occurrence probability and 99% confidence)

LTA concentration based on chronic ECA

LTA_c = 11 µg/l X 0.527 = 5.797 µg/l
(where 0.527 = chronic ECA multiplier at 99% occurrence probability and 99% confidence)

Most Limiting LTA concentration

LTA = 5.797 µg/l

Maximum Daily Effluent Limit (MDEL)

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

MDEL = 5.797 µg/l X 3.11 = **18 µg/l**

Hydrogen Peroxide

Although not currently used, hydrogen peroxide (35 % H_20_2) may be used in the future by the Discharger as a short-term immersion bath treatment in holding tanks, or as a raceway flush treatment. 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. 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 Order does not include water quality-based effluent limitations for hydrogen peroxide. Use and monitoring of hydrogen peroxide must be reported as specified in the attached Monitoring and Reporting Program and the Regional Board may require additional sampling. 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

Although not currently used, potassium permanganate may be used in the future by the Discharger to control gill disease. 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. 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. Potassium permanganate is typically applied in a single, short-term treatment, or as a series of closely spaced, short-term treatments. Results of a single acute toxicity test conducted by the DFG Pesticide Unit using *C. dubia* showed a 96-hour NOAEL of 0.25 mg/L for potassium permanganate. Since there is limited toxicity information available at this time, the Discharger does not use hydrogen peroxide nor has near-future plans to use it, and no information is available regarding actual discharge concentrations of potassium permanganate, this Order does not include water quality-based effluent limitations for potassium permanganate. However, the Discharger shall notify the Regional Board prior to use of potassium permanganate and the Regional Board may require additional sampling. 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 but would be used by the Discharger during outbreaks of bacterial gill disease. Chloramine-T is available for use in accordance with an INAD exemption by FDA. The Discharger reports that the therapeutic treatment consists of a 6 to 15 mg/L for a 1-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_{50} for rainbow trout of 2.8 mg/L. The 48-hour NOEC for *Daphnia magna* was reported as 1.8 mg/L. 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. There is limited toxicity information available for short- and long-term exposure. Since Chloramine-T has not been used at the Facility since 1997 and there is 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. 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 currently used at the Facility to disinfect equipment and eggs prior to incubation. Disinfection of eggs requires 40 gallons during the months of October through February. Equipment disinfection occurs throughout the year and requires 10 gallons per month. It is generally applied in short-term "flush" treatments of less than 1 hour in duration; wastewater is routed to the pollution abatement pond. The FDA considers PVP iodine to be an LRP drug for use in aquaculture. At most CAAP facilities PVP iodine is typically applied in short-term flush treatments of less than 1-hour. 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 PVP iodine were necessary in this Permit. Results of acute toxicity tests using *C. dubia* showed a 96-hour NOAEL of 0.86 mg/L. There is no toxicity information available for shorter exposure periods. The DFG Pesticide Unit is proposing to conduct additional toxicity testing on PVP Iodine 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 PVP Iodine, this permit does not include water quality-based effluent limitations for PVP Iodine. However, use and monitoring of PVP Iodine must be reported 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 toxicity information.

Anesthetics – MS-222, Carbon Dioxide Gas, and Aqui-S

MS-222 is used at the Facility as an anesthetic when handling fingerlings. MS-222, also known as Tricaine methansulfonate (with trade names of Finquel® or Tricaine-S®), has been approved through the INAD process to be used as an anesthetic during spawning or tagging operations. It is intended for the temporary immobilization of fish, amphibians and other aquatic, cold-blooded animals. It has been recognized as a valuable tool for the proper handling of these animals during manual spawning (fish stripping), weighing, measuring, marking, surgical operations, transport, photography, and research. MS-222 is a crystalline powder used as an immersion bath in an enclosed tub. The recommended INAD dosage regime is immersion of the animal at levels ranging from 15 to 330 mg/L. The concentration depends upon the desired degree of anesthesia, species size, water, temperature (generally over 50 °F) temperature and water softness, as well as the stage of development of the fish. There is a 21-day withdrawal time for fish that will be harvested for human consumption.

In 2001, the Discharger used a total of 4.75 pounds of MS-222. Approximately 4.5 pounds were used from October through February when 2.4 million chinook salmon and steelhead were being tagged. The remaining 0.25 pounds were used throughout the year on a monthly basis during inventory and when obtaining weight estimates as a basis for calculating daily feeding rates. During use of MS-222, wastewaters are discharged to the pollution abatement pond, the evaporation/percolation pond, or containerized and disposed of off-site. This Order includes a Waste Disposal Requirement stating 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.

The Discharger also uses carbon dioxide gas as an anesthetic during the monitoring of fish through the upstream fish ladder located at the barrier weir and in the spawning building prior to spawning. FDA considers carbon dioxide gas an LRP drug for use in aquaculture. During monitoring, it is bubbled into holding tanks, which are later discharged directly into Battle Creek. During spawning, carbon dioxide is bubbled into the sorting bins in the spawning building, and routed with the other wastewaters to the evaporation/percolation pond. Given the small volume of carbon dioxide used during the monitoring process, the short time frame, and the high flow rates in Battle Creek, there is no information to suggest that the use of carbon dioxide as an anesthetic has a reasonable potential to impact water quality.

Aqui-S® is a water dispersible liquid anaesthetic for fin fish, crustacea and shell fish and is used in the under an INAD exemption. The Regional Board does not have specific use or toxicity information Aqui-S®. If Aqui-S® is used at the Facility its use must be reported as specified in Provision 3 of this Order.

Oxytetracycline

Oxytetracycline is used by the Discharger to medicate steelhead and late-fall chinook for columnarius disease. Oxytetracycline, also known by the brand name Terramycin®, is an antibiotic approved through FDA's NADA program for use in controlling ulcer disease, furunculosis, bacterial hemorrhagic septicemia, and pseudomonas disease in salmonids. As at most CAAP facilities, oxytetracycline is applied as a feed additive when used at the Facility. 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. The Regional Board has 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 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 is discharged at levels 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 by the Discharger but may be used in the future as a six hour bath for the control of bacterial infections. 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, 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 if it is used it would be discharged at levels 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, would not 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 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

Amoxycillin, erythromycin, florfenicol, and Romet-30® are not currently used but may potentially be used by the Discharger. Amoxycillin 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®, 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 amoxycillin (when injected into fish), erythromycin (when injected into fish or used as a feed additive), florfenicol and Romet-30® (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 amoxycillin, florfenicol, and Romet 30® 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 Ermogen Bacterin to juvenile late-fall Chinook and steelhead. Approximately 5 to 10 gallons are used during April to June. 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 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 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.

Hyamine-1622

Hyamine-1622 was used as a footbath in the hatchery building and to disinfect equipment used in the hatchery building. Small quantities were used generally during the months of April to June (for example in 2002, only one gallon was used during the entire year). However, the Discharger has stated that Hyamine-1622 will not be used at the Facility in the future.

DOMESTIC WASTE DISPOSAL

Domestic wastewater generated at the fish-rearing portion of the Facility is discharged to a septic tank/leachfield system. Domestic wastewater generated at the five residences is discharged to each of their own septic tanks. All five tanks collectively discharge to a single leachfield system.

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.

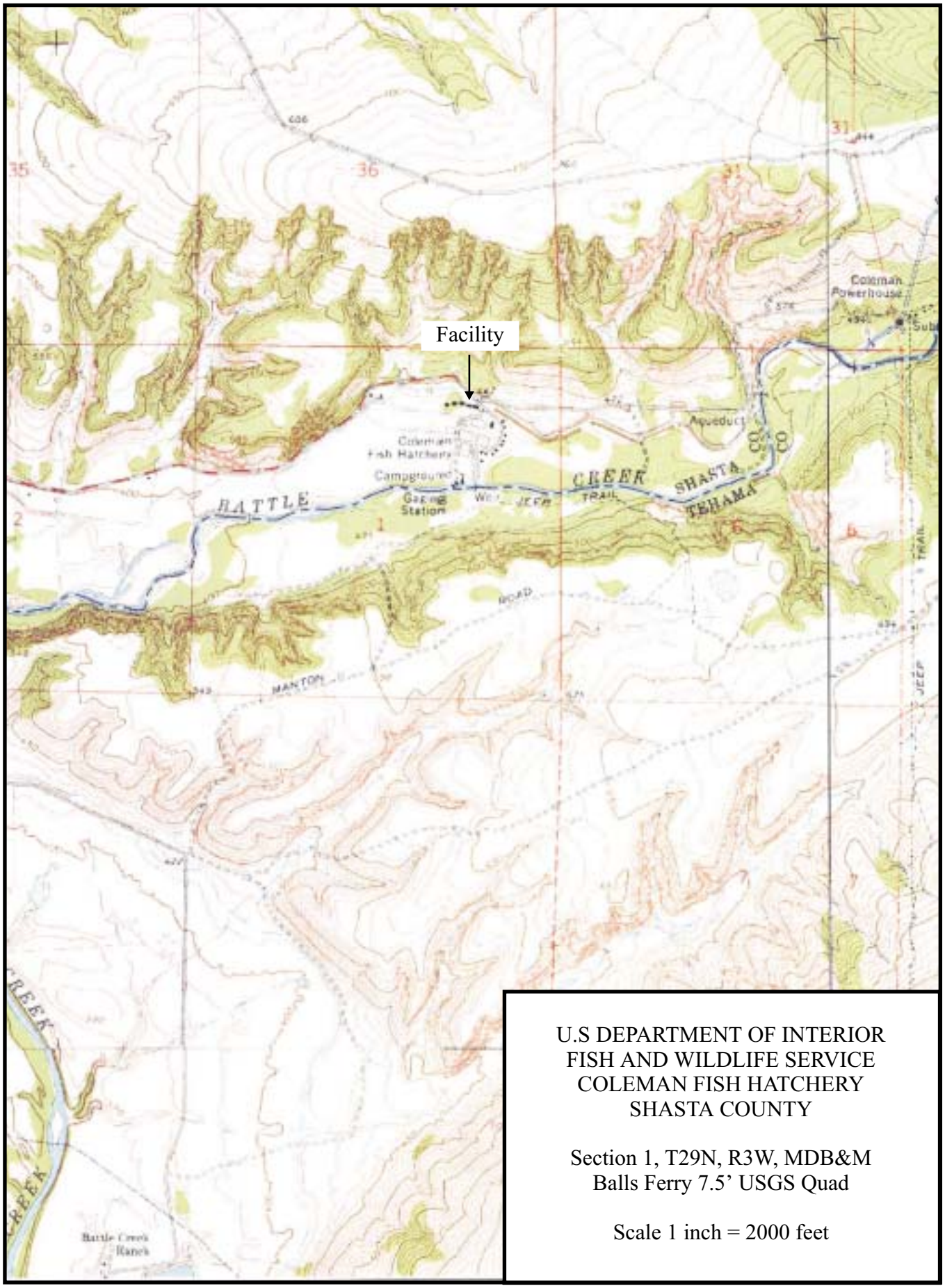
BASIS FOR RECEIVING WATER LIMITATIONS

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. The Discharger is in the process of designing influent and effluent flow measurement devices. Flow measurements required in the Monitoring and Reporting Program will begin upon installation of these devices. Flow rates currently reported are estimates based on the number of raceways in operation. Receiving water monitoring requirements are standard requirements in almost all NPDES permits issued by the Regional Board. Upstream receiving water monitoring location R1 is located 25 feet upstream from the point where Discharge 001 flows into Battle Creek. Downstream receiving water monitoring locations R-2 and R-3 are located in Battle Creek 25 feet downstream of Discharge 002 and 003, respectively.

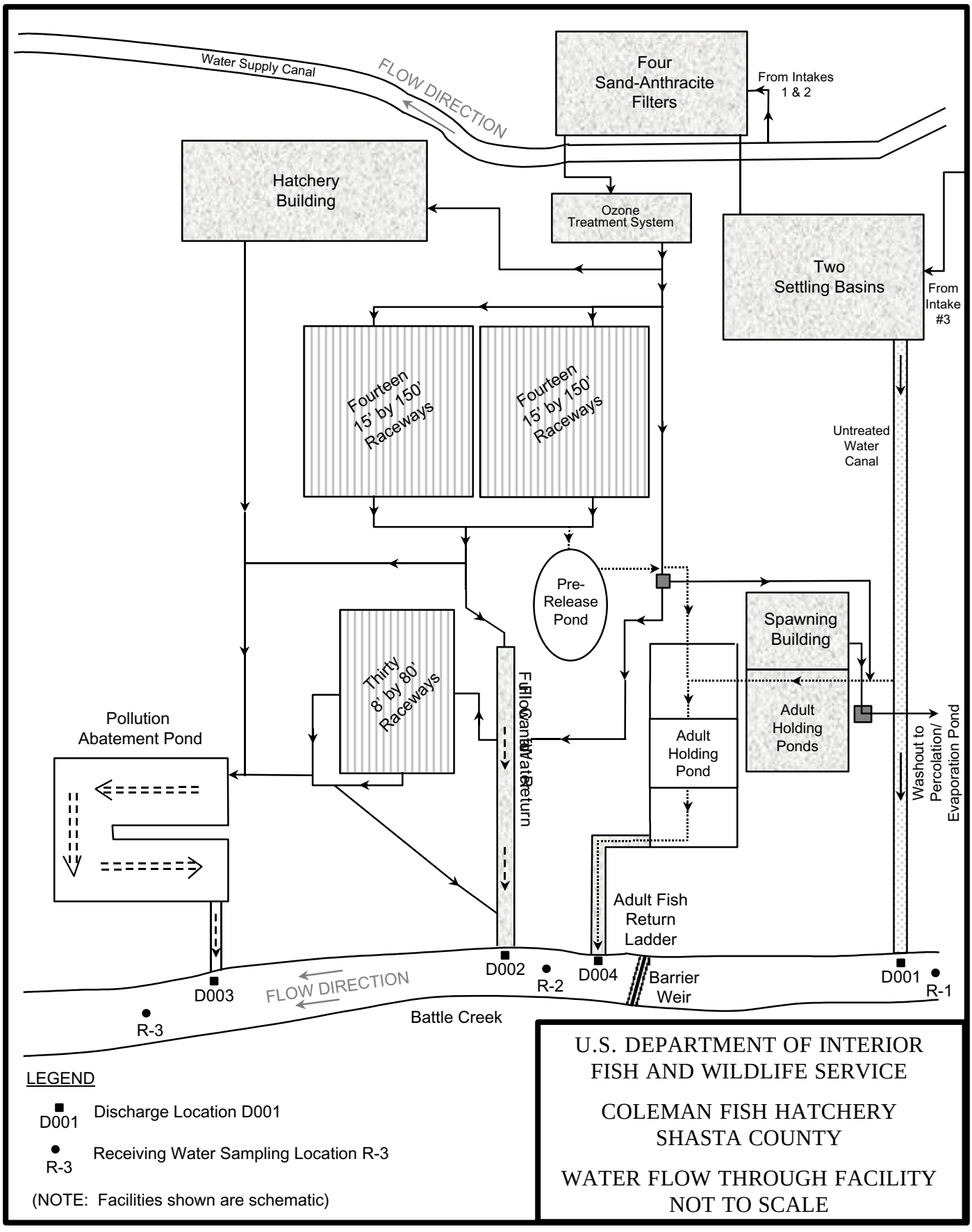
MEB: 10 September 2004



U.S DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE
COLEMAN FISH HATCHERY
SHASTA COUNTY

Section 1, T29N, R3W, MDB&M
Balls Ferry 7.5' USGS Quad

Scale 1 inch = 2000 feet


Water Supply Canal
FLOW DIRECTION
Four
Sand-Anthracite
Filters
From Intakes
1 & 2
Hatchery
Building
Ozone
Treatment System
Two
Settling Basins
From
Intake
#3
Fourteen
15' by 150'
Raceways
Fourteen
15' by 150'
Raceways
Untreated
Water
Canal
Pre-
Release
Pond
Spawning
Building
Thirty
8' by 80'
Raceways
Adult
Holding
Pond
Adult
Holding
Ponds
Pollution
Abatement Pond
Fish Ladder Water Return
Washout to
Percolation/
Evaporation Pond
Adult Fish
Return
Ladder
D003
FLOW DIRECTION
D002
R-2
D004
Barrier
Weir
D001
R-1
R-3
Battle Creek
LEGEND
D001 Discharge Location D001
R-3 Receiving Water Sampling Location R-3
(NOTE: Facilities shown are schematic)
U.S. DEPARTMENT OF INTERIOR
FISH AND WILDLIFE SERVICE
COLEMAN FISH HATCHERY
SHASTA COUNTY
WATER FLOW THROUGH FACILITY
NOT TO SCALE