

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

CENTRAL VALLEY REGION

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ORDER R5-2012-XXXX

NPDES NO. CA0083348

**WASTE DISCHARGE REQUIREMENTS FOR THE
UNIVERSITY OF CALIFORNIA
CENTER FOR AQUATIC BIOLOGY AND AQUACULTURE
YOLO COUNTY**

The following Discharger is subject to waste discharge requirements as set forth in this Order:

Table 1. Discharger Information

Discharger	University of California
Name of Facility	Center for Aquatic Biology and Aquaculture
Facility Address	One Shields Avenue
	Davis, CA 95616
	Yolo County
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board have classified this discharge as a minor discharge.	

The discharge by the University of California, Center for Aquatic Biology and Aquaculture, from the discharge points identified below is subject to waste discharge requirements as set forth in this Order:

Table 2. Discharge Location

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Treated aquaculture wastewater	38° 31' 29.33" N	121° 47' 24.54" W	South Fork Putah Creek
002	Treated aquaculture wastewater	38° 31' 36.66" N	121° 48' 13.59" W	South Fork Putah Creek

Table 3. Administrative Information

This Order was adopted by the Regional Water Quality Control Board on:	<Adoption Date>
This Order shall become effective on:	<Effective Date>
This Order shall expire on:	<Expiration Date>
The Discharger shall file a Report of Waste Discharge in accordance with title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than:	< <u>180 days prior to the Order expiration date</u> OR <u>insert date</u> >

I, **Pamela C. Creedon**, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on **<Adoption Date>**.

PAMELA C. CREEDON, Executive Officer

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I. FACILITY INFORMATION

The following Discharger is subject to waste discharge requirements as set forth in this Order:

Table 4. Facility Information

Discharger	University of California
Name of Facility	Center for Aquatic Biology and Aquaculture
Facility Address	One Shields Avenue
	Davis, CA 95616
	Yolo County
Facility Contact, Title, and Phone	Paul Lutes, Facility Manager, (530)752-8160
Mailing Address	One Shields Avenue, University of California, Davis Davis, CA 95616
Type of Facility	Aquatic Research Facility
Facility Design Flow	1.44 mgd (Discharge Point No. 001)
	1.44 mgd (Discharge Point No. 002)

II. FINDINGS

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

A. Background. The University of California (hereinafter Discharger) is currently discharging pursuant to Order No. R5-2006-0126 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA0083348. The Discharger submitted a Report of Waste Discharge, dated 2 June 2011, and applied for a NPDES permit renewal to discharge up to 1.44 million gallons per day (mgd) of treated wastewater from the Aquatic Center and 1.44 mgd of treated wastewater from the Putah Creek Facility (hereinafter Facilities). The application was deemed complete on 12 July 2011.

For the purposes of this Order, references to the “discharger” or “permittee” in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

B. Facility Description. The Discharger is the owner and operator of the Center for Aquatic Biology and Aquaculture (CABA) that consists of two fish research facilities, the Aquatic Center and the Putah Creek Facility. The Discharger’s Aquaculture and Fisheries Program conducts research focused on toxicology, nutrition, physiology, ecology, engineering, endocrinology, infectious diseases, and other related subjects. Many different species of vertebrate species are studied (trout, salmon, sturgeon, minnows, carp, catfish, striped bass, delta smelt, etc.) using basic aquatic animal husbandry methods, as well as invertebrates and plants. The Facilities operate primarily on a flow-through basis, with only limited recirculating operations. Various aquaculture drugs and chemicals are used on an as-needed basis to clean fish tanks; treat fish for parasites, fungal growths, and bacterial infections; and to anesthetize fish prior to spawning or “tagging” processes.

A portion of the wastewater from the Aquatic Center is produced at an aquatic disease laboratory. Effluent from the aquatic disease laboratory is chlorine disinfected, as required by the Department of Fish and Game (DFG), and routed to a hydraulically isolated evaporation/percolation pond for disposal. The remainder of the wastewater from the Aquatic Center is collected at a sump pump station prior to being circulated through a settling pond, known as Jamison Pond. Effluent from Jamison Pond is directed through a weir box into an on-campus storm drain line and then through Discharge Point No. 001 (see table on cover page) to the South Fork of Putah Creek, a water of the United States, within the Sacramento River Watershed.

The Discharger intends to reroute effluent from the Aquatic Center Facility, with the exception of effluent from the Aquatic Center aquatic disease laboratory, to a series of interconnected wetland channels, each 25 meters long by 0.75 meters wide and 0.6 meters deep, to conduct several studies (See section VI.C.2.b - Wetland Studies). After the effluent passes through the channels, any remaining water will be routed to

Jamison Pond and allowed to completely settle before discharging through Discharge Point No. 001. During the studies, this Order requires that the channels are managed to prevent vector problems, nuisance, and toxicity to wildlife, and to minimize the occurrence of avian botulism, other infectious diseases, and bioaccumulation in the food chain. The channels are to remain dry when the studies are not taking place.

Wastewater from the Putah Creek Facility is circulated through two settling ponds, known as Beaver Pond and Curve Pond, and then through Discharge Point No. 002 (see table on cover page) to the South Fork of Putah Creek, a water of the United States, within the Sacramento River Watershed.

The Discharger intends to reroute effluent from the Putah Creek Facility to a series of wetland ponds (Discharge Point No. 002A) to conduct a study (See section VI.C.2.b - Wetland Studies). During the study, this Order requires that the wetlands are managed to prevent vector problems, nuisance, and toxicity to wildlife, and to minimize the occurrence of avian botulism, other infectious diseases, and bioaccumulation in the food chain. In addition, to protect the wildlife that is attracted to the wetlands, limitations and requirements have been included in this Order for the discharge to ponds and wetlands. The Order requires that toxic pollutants shall not be present in the water column, sediments or biota in concentrations that produce detrimental responses in human, plant, animal, or aquatic life, and that toxic pollutants shall not bioaccumulate in concentrations that are harmful to human health or aquatic resources.

Attachment B provides a map of the area around the Facilities. Attachment C provides a flow schematic of the Facilities.

C. Legal Authorities. This Order is issued pursuant to section 402 of the Clean Water Act (CWA) and implementing regulations adopted by USEPA and chapter 5.5, division 7 of the California Water Code (Water Code; commencing with section 13370). It shall serve as a NPDES permit for point source discharges from this facility to surface

waters. This Order also serves as Waste Discharge Requirements (WDRs) pursuant to article 4, chapter 4, division 7 of the Water Code (commencing with section 13260).

- D. Background and Rationale for Requirements.** The Central Valley Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and other available information. The Fact Sheet (Attachment F), which contains background information and rationale for Order requirements, is hereby incorporated into this Order and constitutes part of the Findings for this Order. Attachments A through E and G through J are also incorporated into this Order.
- E. California Environmental Quality Act (CEQA).** Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code sections 21100-21177.
- F. Technology-based Effluent Limitations.** Section 301(b) of the CWA and implementing USEPA permit regulations at section 122.44, title 40 of the Code of Federal Regulations (40 CFR 122.44), require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this Order must meet minimum federal technology-based requirements based on Best Professional Judgment (BPJ) in accordance with 40 CFR 125.3. A detailed discussion of the technology-based effluent limitations development is included in the Fact Sheet.
- G. Water Quality-based Effluent Limitations (WQBELs).** Section 301(b) of the CWA and 40 CFR 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

40 CFR 122.44(d)(1)(i) mandates that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been

established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established using: (1) USEPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state’s narrative criterion, supplemented with other relevant information, as provided in 40 CFR 122.44(d)(1)(vi).

H. Water Quality Control Plans. The Central Valley Water Board adopted a *Water Quality Control Plan, Fourth Edition (Revised October 2011)*, for the Sacramento and San Joaquin River Basins (hereinafter Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. In addition, the Basin Plan implements State Water Resources Control Board (State Water Board) Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the South Fork of Putah Creek are as follows:

Table 5. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001 and 002	South Fork of Putah Creek	<p><u>Existing:</u></p> <p>Municipal and domestic supply (MUN); Agricultural supply, including irrigation and stock watering (AGR); Water contact recreation, including canoeing and rafting (REC-1); Non-contact water recreation (REC-2); Warm freshwater habitat (WARM); Spawning, reproduction, and/or early development, warm (SPWN); Wildlife habitat (WILD)</p> <p><u>Potential:</u></p> <p>Cold freshwater habitat (COLD)</p>

The Basin Plan includes a list of Water Quality Limited Segments (WQLSs), which are defined as “...those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources (40 CFR 130, et seq.)” The Basin Plan also states, “Additional treatment beyond minimum federal standards will be imposed on dischargers to WQLSs. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.” Putah Creek is listed on the 2010 303(d) list as impaired for boron and mercury. TMDLs have not been adopted for Putah Creek; therefore, this Order requires the Discharger to monitor for boron and mercury. Since the discharge is outside of the Sacramento-San Joaquin Delta, the Chlorpyrifos and Diazinon TMDL is not applicable.

Requirements of this Order implement the Basin Plan.

- I. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA adopted the NTR on 22 December 1992, and later amended it on 4 May 1995 and 9 November 1999. About 40 criteria in the NTR applied in California. On 18 May 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on 13 February 2001. These rules contain water quality criteria for priority pollutants.

- J. **State Implementation Policy.** On 2 March 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on 28 April 2000 with respect to the priority pollutant criteria promulgated for California by USEPA through the NTR and to the priority pollutant objectives established by the Central Valley Water Board in the Basin Plan. The SIP became effective on 18 May 2000 with respect to the priority pollutant criteria promulgated by USEPA through the CTR. The State Water Board adopted amendments to the SIP on 24 February 2005 that became effective on 13 July 2005.

The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this Order implement the SIP.

K. Compliance Schedules and Interim Requirements - Not Applicable

L. Alaska Rule. On 30 March 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards become effective for CWA purposes. (40 CFR 131.21 and 65 FR 24641 (27 April 2000).) Under the revised regulation (also known as the Alaska rule), new and revised standards submitted to USEPA after 30 May 2000, must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by 30 May 2000 may be used for CWA purposes, whether or not approved by USEPA.

M. Stringency of Requirements for Individual Pollutants. This Order contains both technology-based effluent limitations and WQBELs for individual pollutants. The technology-based effluent limitations consist of restrictions on total suspended solids (TSS), and settleable solids. The WQBELs consist of restrictions on chlorine residual, chromium (VI), electrical conductivity, formaldehyde, iron, and pH. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements.

WQBELs have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that toxic pollutant WQBELs were derived from the CTR, the CTR is the applicable standard pursuant to 40 CFR 131.38. The scientific procedures for calculating the individual WQBELs for priority pollutants are based on the CTR-SIP, which was approved by USEPA on 18 May 2000. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to 30 May 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to 30 May 2000, but not

approved by USEPA before that date, are nonetheless “*applicable water quality standards for purposes of the [Clean Water] Act*” pursuant to 40 CFR 131.21(c)(1).

Collectively, this Order’s restrictions on individual pollutants are no more stringent than required to implement the technology-based requirements of the CWA and the applicable water quality standards for purposes of the CWA.

- N. Antidegradation Policy.** 40 CFR 131.12 requires that the state water quality standards include an antidegradation policy consistent with the federal policy. The State Water Board established California’s antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Central Valley Water Board’s Basin Plan implements, and incorporates by reference, both the state and federal antidegradation policies. As discussed in detail in the Fact Sheet, the permitted discharge is consistent with the antidegradation provision of 40 CFR 131.12 and Resolution No. 68-16.
- O. Anti-Backsliding Requirements.** Sections 303(d)(4) and 402(o)(2) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions. Some effluent limitations in this Order are less stringent than those in Order No. R5-2006-0126. As discussed in detail in the Fact Sheet, this relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.
- P. Endangered Species Act.** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the beneficial uses of

waters of the state. The discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

- Q. Monitoring and Reporting.** 40 CFR 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorize the Central Valley Water Board to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement federal and State requirements. The Monitoring and Reporting Program is provided in Attachment E.
- R. Standard and Special Provisions.** Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment D. The discharger must comply with all standard provisions and with those additional conditions that are applicable under 40 CFR 122.42. The Central Valley Water Board has also included in this Order special provisions applicable to the Discharger. A rationale for the special provisions contained in this Order is provided in the Fact Sheet.
- S. Provisions and Requirements Implementing State Law.** The provisions/requirements in Sections IV.B, V.B, and VI.A.2.o of this Order are included to implement state law only. These provisions/requirements are not required or authorized under the federal CWA; consequently, violations of these provisions/requirements are not subject to the enforcement remedies that are available for NPDES violations.
- T. Notification of Interested Parties.** The Central Valley Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe WDRs for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet of this Order.

U. Consideration of Public Comment. The Central Valley Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the Public Hearing are provided in the Fact Sheet.

THEREFORE, IT IS HEREBY ORDERED, that Order No. R5-2006-0126 is rescinded upon the effective date of this Order except for enforcement purposes, and, in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal CWA and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

III. DISCHARGE PROHIBITIONS

- A.** Discharge of wastewater at a location or in a manner different from that described in the Findings is prohibited.
- B.** The discharge of aquaculture drugs and/or chemicals for which the Central Valley Water Board has not authorized its use in this Order, and determined whether waste discharge requirements are required, is prohibited.
- C.** The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Federal Standard Provisions I.G. and I.H. (Attachment D).
- D.** Neither the discharge nor its treatment shall create a nuisance as defined in section 13050 of the Water Code.
- E.** The discharge of any wastewater or any alcohol, formaldehyde, phenolic resin, or melamine resin storage tank spill catchment basin water or residue to any ground surface, surface waters, or surface water drainage courses is prohibited except as specified in this Order.
- F.** The discharge of any wastes to the ground surface, surface waters or surface water drainage courses is prohibited except as specified in this Order.

- G. The discharge of waste classified as “hazardous” as defined in Sections 2521(a) and 2522(a) of 23 CCR Division 3, Chapter 15 to surface water or ponds is prohibited.
- H. The discharge of wastewater from the Aquatic Center evaporation and percolation pond to surface waters is prohibited.
- I. The Discharger shall not allow pollutant-free wastewater to be discharged into the treatment or disposal, system in amounts that significantly diminish the system’s capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations - Discharge Point Nos. 001 and 002

1. Final Effluent Limitations - Discharge Point No. 001

- a. The Discharger shall maintain compliance with the following effluent limitations at Discharge Point No. 001, with compliance measured at Monitoring Location EFF-001 as described in the Monitoring and Reporting Program:

Table 6. Effluent Limitations - Discharge Point No. 001

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Total Suspended Solids	mg/L	25	40	65	--	--
	lbs/day	110	176	286	--	--
Chlorine, Total Residual	µg/L	--	--	18	--	--
Chromium (VI)	µg/L	11	--	15	--	--
Formaldehyde	mg/L	0.60	--	1.3	--	--
Settleable Solids	µg/L	--	--	0.1	--	--
pH	µg/L	--	--	--	6.5	8.5

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum

b. Acute Whole Effluent Toxicity. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

- i. 70%, minimum for any one bioassay; and
- ii. 90%, median for any three consecutive bioassays.

c. Average Dry Weather Flow. The average dry weather discharge flow shall not exceed 1.44 mgd.

d. Electrical Conductivity. Effluent electrical conductivity concentrations shall not exceed 744 µmhos/cm, as an annual average.

e. Iron. Effluent total recoverable iron concentrations shall not exceed 300 µg/L, as an annual average.

2. Final Effluent Limitations - Discharge Point No. 002

a. The Discharger shall maintain compliance with the following effluent limitations at Discharge Point No. 002, with compliance measured at Monitoring Location EFF-002 as described in the Monitoring and Reporting Program:

Table 7. Effluent Limitations - Discharge Point No. 002

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Total Suspended Solids	mg/L	25	40	65	--	--
	lbs/day	86	138	224	--	--
Chlorine, Total Residual	µg/L	--	--	18	--	--
Chromium (VI)	µg/L	10	--	16	--	--
Formaldehyde	mg/L	0.60	--	1.3	--	--

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Settleable Solids	µg/L	--	--	0.1	--	--
pH	µg/L	--	--	--	6.5	8.5

b. Acute Whole Effluent Toxicity. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

- i. 70%, minimum for any one bioassay; and
- ii. 90%, median for any three consecutive bioassays.

c. Average Dry Weather Flow. The average dry weather discharge flow shall not exceed 1.44 mgd.

d. Electrical Conductivity. Effluent electrical conductivity concentrations shall not exceed 748 µmhos/cm, as an annual average.

e. Iron. Effluent total recoverable iron concentrations shall not exceed 300 µg/L, as an annual average.

3. Interim Effluent Limitations - Not Applicable

B. Land Discharge Specifications

1. Jamison Pond, Aquatic Center Wetland Channels, Beaver Pond₁—and Curve Pond₁, and Putah Creek Wetland Ponds

- a. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of groundwater limitations.
- b. Objectionable odors originating at this Facility shall not be perceivable beyond the limits of the wastewater treatment and disposal areas (or property owned by the Discharger).

- c. The dissolved oxygen content in the upper zone (1 foot) of wastewater in ponds shall not be less than 1.0 mg/L.
- d. Ponds shall not have a pH less than 6.5 or greater than 8.5.
- e. Ponds shall be managed to prevent breeding of mosquitoes. In particular,
 - i. An erosion control program should assure that small coves and irregularities are not created around the perimeter of the water surface.
 - ii. Weeds shall be minimized.
 - iii. Dead algae, vegetation, and debris shall not accumulate on the water surface.
- f. Ponds shall have sufficient capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.
- g. Freeboard shall never be less than 1 foot (measured vertically to the lowest point of overflow) to prevent overflows.
- h. Public contact with wastewater shall be precluded through such means as fences, signs, and other acceptable alternatives.
- i. All tail waters from each adjacent wetland pond or channels shall be returned to their respective Facility for treatment and discharge.

2. Aquatic Center Evaporation/Percolation Pond

- a. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of groundwater limitations.
- b. There shall be no discharge of wastewater to surface water from this pond.

- c. Objectionable odors originating at this Facility shall not be perceivable beyond the limits of the wastewater treatment and disposal areas (or property owned by the Discharger).
- d. The dissolved oxygen content in the upper zone (1 foot) of wastewater in ponds shall not be less than 1.0 mg/L.
- e. Ponds shall not have a pH less than 6.5 or greater than 8.5.
- f. Ponds shall be managed to prevent breeding of mosquitoes. In particular,
 - i. An erosion control program should assure that small coves and irregularities are not created around the perimeter of the water surface.
 - ii. Weeds shall be minimized.
 - iii. Dead algae, vegetation, and debris shall not accumulate on the water surface.
- g. Ponds shall have sufficient capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.
- h. Freeboard shall never be less than 1 foot (measured vertically to the lowest point of overflow) to prevent overflows.
- i. Public contact with wastewater shall be precluded through such means as fences, signs, and other acceptable alternatives.

C. Reclamation Specifications - Not Applicable

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

Receiving water limitations are based on water quality objectives contained in the Basin Plan and are a required part of this Order. The discharge shall not cause the following in the South Fork of Putah Creek:

1. **Bacteria.** The fecal coliform concentration, based on a minimum of not less than five samples for any 30-day period, to exceed a geometric mean of 200 MPN/100 mL, nor more than 10 percent of the total number of fecal coliform samples taken during any 30-day period to exceed 400 MPN/100 mL.
2. **Biostimulatory Substances.** Water to contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.
3. **Chemical Constituents.** Chemical constituents to be present in concentrations that adversely affect beneficial uses.
4. **Color.** Discoloration that causes nuisance or adversely affects beneficial uses.
5. **Dissolved Oxygen:**
 - a. The monthly median of the mean daily dissolved oxygen concentration to fall below 85 percent of saturation in the main water mass;
 - b. The 95 percentile dissolved oxygen concentration to fall below 75 percent of saturation; nor
 - c. The dissolved oxygen concentration to be reduced below 7.0 mg/L at any time.
6. **Floating Material.** Floating material to be present in amounts that cause nuisance or adversely affect beneficial uses.

7. **Oil and Grease.** Oils, greases, waxes, or other materials to be present in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.
8. **pH.** The pH to be depressed below 6.5 nor raised above 8.5.
9. **Pesticides:**
 - a. Pesticides to be present, individually or in combination, in concentrations that adversely affect beneficial uses;
 - b. Pesticides to be present in bottom sediments or aquatic life in concentrations that adversely affect beneficial uses;
 - c. Total identifiable persistent chlorinated hydrocarbon pesticides to be present in the water column at concentrations detectable within the accuracy of analytical methods approved by USEPA or the Executive Officer.
 - d. Pesticide concentrations to exceed those allowable by applicable antidegradation policies (see State Water Board Resolution No. 68-16 and 40 CFR 131.12.);
 - e. Pesticide concentrations to exceed the lowest levels technically and economically achievable;
 - f. Pesticides to be present in concentration in excess of the maximum contaminant levels set forth in CCR, Title 22, division 4, chapter 15; nor
 - g. Thiobencarb to be present in excess of 1.0 µg/L.
10. **Radioactivity:**
 - a. Radionuclides to be present in concentrations that are harmful to human, plant, animal, or aquatic life nor 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.

b. Radionuclides to be present in excess of the maximum contaminant levels specified in Table 4 (MCL Radioactivity) of section 64443 of Title 22 of the California Code of Regulations.

12. Suspended Sediments. The suspended sediment load and suspended sediment discharge rate of surface waters to be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

13. Settleable Substances. Substances to be present in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.

14. Suspended Material. Suspended material to be present in concentrations that cause nuisance or adversely affect beneficial uses.

15. Taste and Odors. Taste- or odor-producing substances to be present in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.

16. Temperature. The natural temperature to be increased by more than 5°F.

17. Toxicity. Toxic substances to be present, individually or in combination, in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.

18. Turbidity.

- a. Shall not exceed 2 Nephelometric Turbidity Units (NTU) where natural turbidity is less than 1 NTU;
- b. Shall not increase more than 1 NTU where natural turbidity is between 1 and 5 NTUs;
- c. Shall not increase more than 20 percent where natural turbidity is between 5 and 50 NTUs;

- d. Shall not increase more than 10 NTU where natural turbidity is between 50 and 100 NTUs; nor
- e. Shall not increase more than 10 percent where natural turbidity is greater than 100 NTUs.

B. Groundwater Limitations

- 1. Release of waste constituents from any portion of the Facility shall not cause groundwater to contain waste constituents in concentrations greater than background water quality or water quality objectives, whichever is greater. The discharge shall not unreasonably affect beneficial uses or cause a condition of pollution or nuisance in the groundwater.

VI. PROVISIONS

A. Standard Provisions

- 1. The Discharger shall comply with all Standard Provisions (federal NPDES standard conditions from 40 CFR Part 122) included in Attachment D of this Order.
- 2. The Discharger shall comply with the following provisions:
 - a. If the Discharger's wastewater treatment plant is publicly owned or subject to regulation by California Public Utilities Commission, it shall be supervised and operated by persons possessing certificates of appropriate grade according to Title 23, CCR, division 3, chapter 26.
 - b. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:
 - i. violation of any term or condition contained in this Order;
 - ii. obtaining this Order by misrepresentation or by failing to disclose fully all relevant facts;

iii. a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge; and

iv. a material change in the character, location, or volume of discharge.

The causes for modification include:

- *New regulations.* New regulations have been promulgated under section 405(d) of the CWA, or the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued.
- *Land application plans.* When required by a permit condition to incorporate a land application plan for beneficial reuse of sewage sludge, to revise an existing land application plan, or to add a land application plan.
- *Change in sludge use or disposal practice.* Under 40 CFR 122.62(a)(1), a change in the Discharger's sludge use or disposal practice is a cause for modification of the permit. It is cause for revocation and reissuance if the Discharger requests or agrees.

The Central Valley Water Board may review and revise this Order at any time upon application of any affected person or the Central Valley Water Board's own motion.

- c. If a toxic effluent standard or prohibition (including any scheduled compliance specified in such effluent standard or prohibition) is established under section 307(a) of the CWA, or amendments thereto, for a toxic pollutant that is present in the discharge authorized herein, and such standard or prohibition is more stringent than any limitation upon such pollutant in this Order, the Central Valley Water Board will revise or modify this Order in accordance with such toxic effluent standard or prohibition.

The Discharger shall comply with effluent standards and prohibitions within the

time provided in the regulations that establish those standards or prohibitions, even if this Order has not yet been modified.

- d. This Order shall be modified, or alternately revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:
 - i. Contains different conditions or is otherwise more stringent than any effluent limitation in the Order; or
 - ii. Controls any pollutant limited in the Order.

The Order, as modified or reissued under this paragraph, shall also contain any other requirements of the CWA then applicable.

- e. The provisions of this Order are severable. If any provision of this Order is found invalid, the remainder of this Order shall not be affected.
- f. The Discharger shall take all reasonable steps to minimize any adverse effects to waters of the State or users of those waters resulting from any discharge or sludge use or disposal in violation of this Order. Reasonable steps shall include such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge or sludge use or disposal.
- g. The Discharger shall ensure compliance with any existing or future pretreatment standard promulgated by USEPA under section 307 of the CWA, or amendment thereto, for any discharge to the municipal system.
- h. A copy of this Order shall be maintained at the discharge facility and be available at all times to operating personnel. Key operating personnel shall be familiar with its content.
- i. Safeguard to electric power failure:

- i. The Discharger shall provide safeguards to assure that, should there be reduction, loss, or failure of electric power, the discharge shall comply with the terms and conditions of this Order.
- ii. Upon written request by the Central Valley Water Board, the Discharger shall submit a written description of safeguards. Such safeguards may include alternate power sources, standby generators, retention capacity, operating procedures, or other means. A description of the safeguards provided shall include an analysis of the frequency, duration, and impact of power failures experienced over the past 5 years on effluent quality and on the capability of the Discharger to comply with the terms and conditions of the Order. The adequacy of the safeguards is subject to the approval of the Central Valley Water Board.
- iii. Should the treatment works not include safeguards against reduction, loss, or failure of electric power, or should the Central Valley Water Board not approve the existing safeguards, the Discharger shall, within 90 days of having been advised in writing by the Central Valley Water Board that the existing safeguards are inadequate, provide to the Central Valley Water Board and USEPA a schedule of compliance for providing safeguards such that in the event of reduction, loss, or failure of electric power, the Discharger shall comply with the terms and conditions of this Order. The schedule of compliance shall, upon approval of the Central Valley Water Board, become a condition of this Order.
- j. The Discharger, upon written request of the Central Valley Water Board, shall file with the Board a technical report on its preventive (failsafe) and contingency (cleanup) plans for controlling accidental discharges, and for minimizing the effect of such events. This report may be combined with that required under Central Valley Water Board Standard Provision contained in section VI.A.2.i. of this Order.

The technical report shall:

- i. Identify the possible sources of spills, leaks, untreated waste by-pass, and contaminated drainage. Loading and storage areas, power outage, waste treatment unit outage, and failure of process equipment, tanks and pipes should be considered.
- ii. Evaluate the effectiveness of present facilities and procedures and state when they became operational.
- iii. Predict the effectiveness of the proposed facilities and procedures and provide an implementation schedule containing interim and final dates when they will be constructed, implemented, or operational.

The Central Valley Water Board, after review of the technical report, may establish conditions which it deems necessary to control accidental discharges and to minimize the effects of such events. Such conditions shall be incorporated as part of this Order, upon notice to the Discharger.

- k. A publicly owned treatment works whose waste flow has been increasing, or is projected to increase, shall estimate when flows will reach hydraulic and treatment capacities of its treatment and disposal facilities. The projections shall be made in January, based on the last 3 years' average dry weather flows, peak wet weather flows and total annual flows, as appropriate. When any projection shows that capacity of any part of the facilities may be exceeded in 4 years, the Discharger shall notify the Central Valley Water Board by 31 January. A copy of the notification shall be sent to appropriate local elected officials, local permitting agencies and the press. Within 120 days of the notification, the Discharger shall submit a technical report showing how it will prevent flow volumes from exceeding capacity or how it will increase capacity to handle the larger flows. The Central Valley Water Board may extend the time for submitting the report.
- l. The Discharger shall submit technical reports as directed by the Executive Officer. All technical reports required herein that involve planning, investigation,

- evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code, sections 6735, 7835, and 7835.1. To demonstrate compliance with Title 16, CCR, sections 415 and 3065, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.
- m. The Central Valley Water Board is authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387.
 - n. For publicly owned treatment works, prior to making any change in the point of discharge, place of use, or purpose of use of treated wastewater that results in a decrease of flow in any portion of a watercourse, the Discharger must file a petition with the State Water Board, Division of Water Rights, and receive approval for such a change. (Water Code section 1211).
 - o. In the event the Discharger does not comply or will be unable to comply for any reason, with any prohibition, maximum daily effluent limitation, 1-hour average effluent limitation, or receiving water limitation contained in this Order, the Discharger shall notify the Central Valley Water Board by telephone (916) 464-3291 within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within 5 days, unless the Central Valley Water Board waives confirmation. The written notification shall include the information required by the Standard Provision contained in Attachment D section V.E.1. [40 CFR 122.41(l)(6)(i)].
 - p. Failure to comply with provisions or requirements of this Order, or violation of other applicable laws or regulations governing discharges from this facility, may subject the Discharger to administrative or civil liabilities, criminal penalties,

and/or other enforcement remedies to ensure compliance. Additionally, certain violations may subject the Discharger to civil or criminal enforcement from appropriate local, state, or federal law enforcement entities.

- q. 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 the Central Valley Water Board.

To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, address and telephone number of the persons responsible for contact with the Central Valley Water Board and a statement. The statement shall comply with the signatory and certification requirements in the federal Standard Provisions (Attachment D, section V.B) and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.

B. Monitoring and Reporting Program Requirements

The Discharger shall comply with the Monitoring and Reporting Program, and future revisions thereto, in Attachment E of this Order.

C. Special Provisions

1. Reopener Provisions

- a. Conditions that necessitate a major modification of a permit are described in 40 CFR 122.62, including, but not limited to:

- i. If new or amended applicable water quality standards are promulgated or approved pursuant to section 303 of the CWA, or amendments thereto, this permit may be reopened and modified in accordance with the new or amended standards.
 - ii. When new information, that was not available at the time of permit issuance, would have justified different permit conditions at the time of issuance.
- b. **Whole Effluent Toxicity.** As a result of a Toxicity Reduction Evaluation (TRE), this Order may be reopened to include a chronic toxicity limitation, a new acute toxicity limitation, and/or a limitation for a specific toxicant identified in the TRE. Additionally, if the State Water Board revises the SIP's toxicity control provisions that would require the establishment of numeric chronic toxicity effluent limitations, this Order may be reopened to include a numeric chronic toxicity effluent limitation based on the new provisions.

2. Special Studies, Technical Reports and Additional Monitoring Requirements

- a. **Chronic Whole Effluent Toxicity.** For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct chronic whole effluent toxicity (WET) testing, as specified in the Monitoring and Reporting Program (Attachment E, section V). Furthermore, this Provision requires the Discharger to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity. If the discharge exhibits toxicity, as described in subsection ii below, the Discharger is required to initiate a TRE in accordance with an approved TRE Workplan, and take actions to mitigate the impact of the discharge and prevent recurrence of toxicity. A TRE is a site-specific study conducted in a stepwise process to identify the source(s) of toxicity and the effective control measures for effluent toxicity. TREs are designed to identify the causative agents and sources of effluent toxicity, evaluate the effectiveness of the toxicity control options, and confirm the reduction in effluent toxicity. This Provision includes requirements for the Discharger to develop and submit a TRE

Workplan and includes procedures for accelerated chronic toxicity monitoring and TRE initiation.

- i. Initial Investigative TRE Workplan.** Within 90 days of the effective date of this Order, the Discharger shall submit to the Central Valley Water Board an Initial Investigative TRE Workplan for approval by the Executive Officer. This should be a one to two page document including, at a minimum:

 - (a)** A description of the investigation and evaluation techniques that will be used to identify potential causes and sources of effluent toxicity, effluent variability, and treatment system efficiency;
 - (b)** A description of the facility's methods of maximizing in-house treatment efficiency and good housekeeping practices, and a list of all chemicals used in operation of the facility; and
 - (c)** A discussion of who will conduct the Toxicity Identification Evaluation (TIE), if necessary (e.g., an in-house expert or outside contractor).
- ii. Accelerated Monitoring and TRE Initiation.** When the numeric toxicity monitoring trigger is exceeded during regular chronic toxicity monitoring, the Discharger shall initiate accelerated monitoring as required in the Accelerated Monitoring Specifications. The Discharger shall initiate a TRE to address effluent toxicity if any WET testing results exceed the numeric toxicity monitoring trigger during accelerated monitoring.
- iii. Numeric Toxicity Monitoring Trigger.** The numeric toxicity monitoring trigger to initiate a TRE is $> 1 \text{ TU}_c$ (where $\text{TU}_c = 100/\text{NOEC}$). The monitoring trigger is not an effluent limitation; it is the toxicity threshold at which the Discharger is required to begin accelerated monitoring and initiate a TRE when the effluent exhibits toxicity.
- iv. Accelerated Monitoring Specifications.** If the numeric toxicity monitoring trigger is exceeded during regular chronic toxicity testing, the Discharger shall

initiate accelerated monitoring within 14 days of notification by the laboratory of the exceedance. Accelerated monitoring shall consist of four (4) chronic toxicity tests conducted once every 2 weeks using the species that exhibited toxicity. The following protocol shall be used for accelerated monitoring and TRE initiation:

- (a) If the results of four (4) consecutive accelerated monitoring tests do not exceed the monitoring trigger, the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring. However, notwithstanding the accelerated monitoring results, if there is evidence of effluent toxicity, the Executive Officer may require that the Discharger initiate a TRE.
- (b) If the source(s) of the toxicity is easily identified (e.g., temporary plant upset), the Discharger shall make necessary corrections to the facility and shall continue accelerated monitoring until four (4) consecutive accelerated tests do not exceed the monitoring trigger. Upon confirmation that the effluent toxicity has been removed, the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring.
- (c) If the result of any accelerated toxicity test exceeds the monitoring trigger, the Discharger shall cease accelerated monitoring and begin a TRE to investigate the cause(s) of, and identify corrective actions to reduce or eliminate effluent toxicity. Within thirty (30) days of notification by the laboratory of any test result exceeding the monitoring trigger during accelerated monitoring, the Discharger shall submit a TRE Action Plan to the Central Valley Water Board including, at minimum:

 - (1) Specific actions the Discharger will take to investigate and identify the cause(s) of toxicity, including a TRE WET monitoring schedule;
 - (2) Specific actions the Discharger will take to mitigate the impact of the discharge and prevent the recurrence of toxicity; and

(3) A schedule for these actions.

Within sixty (60) days of notification by the laboratory of the test results, the Discharger shall submit to the Central Valley Water Board a TRE Workplan for approval by the Executive Officer. The TRE Workplan shall outline the procedures for identifying the source(s) of, and reducing or eliminating effluent toxicity. The TRE Workplan must be developed in accordance with USEPA guidance¹.

b. Wetland Studies. If a study (or studies) to reroute effluent from the Aquatic Center Facility to the wetland channels, or from the Putah Creek Facility to the wetland ponds, are planned, the Discharger must submit a study work plan that includes at minimum the start date, planned duration, and the approximate flowrate and percentage of effluent rerouted to the wetland channels or ponds. The study work plan must be submitted six months prior to implementation of the study. If the Discharger decides to implement any study as new operational procedures for the Aquatic Center and/or the Putah Creek facilities, the Discharger must furnish the data and study findings with its Report of Waste Discharge for the next NPDES Permit renewal for Central Valley Water Board approval.

3. Best Management Practices and Pollution Prevention

a. Best Management Practices (BMP) and Pollution Prevention

Within 90 days of issuance of this Order, the Discharger must submit a technical report certifying that a BMP Plan has been developed and is being implemented. An existing BMP plan may be modified for use under this section. The Discharger shall develop and implement the BMP Plan to prevent or minimize the generation and discharge of wastes and pollutants to waters of

¹ See the Fact Sheet (Attachment F section VII.B.2.a.) for a list of USEPA guidance documents that must be considered in development of the TRE Workplan.

the United States and waters of the State and ensure disposal or land application of wastes is in compliance with applicable solid waste disposal regulations. The BMP Plan shall include a salinity evaluation and minimization plan to address salt treatments at the Facilities. The Discharger shall review the BMP Plan annually and must amend the BMP Plan whenever there is a change in the facilities or in the operation of the facilities which materially increases the generation of pollutants or their release or potential release to surface waters.

The BMP plan must include, at a minimum, the following BMPs:

- v. Operational requirements for solids control. The Discharger shall:
 - (a) Feed management and feeding strategies must minimize the discharge of unconsumed food.
 - (b) Tanks and ponds must be cleaned at such frequency and in such a manner to minimize the discharge of accumulated solids discharged to waters of the U.S.
 - (c) Fish grading, harvesting and other activities within tanks or ponds must be conducted in such a manner to minimize the discharge of accumulated solids.
 - (d) Fish mortalities must be removed and properly disposed of on a regular basis to prevent discharge to waters of the U.S., except in cases where the discharge to surface waters is determined to benefit the aquatic environment. Procedures must be identified and implemented to collect, store, and dispose of fish and other solid wastes.
 - (e) Water used in the rearing or holding units or hauling trucks that is disinfected with chlorine or other chemicals must meet effluent limitations in this Order before it is discharged to waters of the U.S.

(f) All drugs and pesticides must be used in accordance with applicable label directions (FIFRA or FDA), except under the following conditions, both of which must be reported to the Executive Officer:

(1) Participation in Investigational New Animal Drug (INAD) studies, using established protocols; or

(2) Extralabel drug use, as prescribed by a veterinarian.

vi. Materials storage. The Discharger shall:

(a) Ensure proper storage of drugs, chemicals, and feed in a manner designed to prevent spills that may result in the discharge of drugs, pesticides or feed to waters of the United States.

(b) Implement procedures for properly containing, cleaning, and disposing of any spilled material.

vii. Structural maintenance. The Discharger shall:

(a) Inspect the production system and the wastewater treatment system on a routine basis in order to identify and promptly repair any damage.

(b) Conduct regular maintenance of the production system and the wastewater treatment system in order to ensure that they are properly functioning.

viii. Recordkeeping. The Discharger shall:

(a) In order to calculate representative feed conversion ratios, maintain records for aquatic animal rearing units documenting the feed amounts and estimates of the numbers and weight of aquatic animals.

(b) Keep records documenting the frequency of cleaning, inspections, maintenance and repairs.

ix. Training. The Discharger shall:

- (a) 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 adequately.
- (b) Train personnel 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.

4. Construction, Operation and Maintenance Specifications

- a. The Facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.

5. Special Provisions for Municipal Facilities (POTWs Only) - Not Applicable

6. Other Special Provisions

a. Drug and Other Chemical Use Reporting

This Order authorizes the discharge of MS-222, oxytetracycline, formaldehyde, PVP Iodine, sodium chloride, chlorine (bleach/sodium hypochlorite), chloramine-T, potassium permanganate, hydrogen peroxide, amoxicillin, erythromycin, florfenical, and Romet-30 to surface waters in accordance with label directions, effluent limitations, Best Management Plan requirements, Monitoring and Reporting requirements and other conditions of this Order. Other aquaculture chemicals or drugs that may enter the wastewater discharge need to be authorized by the Executive Officer after written notification from the Discharger has been submitted to the Central Valley Water Board. The notification shall contain the following supplemental information:

- i. The common name(s) and active ingredient(s) of the drug or chemical proposed for use and discharge;
- ii. The purpose for the proposed use of the drug or chemical (i.e., list the specific disease for treatment and specific species for treatment);
- iii. The amount proposed for use and the resulting calculated concentration in the discharge;
- iv. The duration and frequency of the proposed use;
- v. Material Safety Data Sheets and available toxicity information; and
- vi. Any related Investigational New Animal Drug (INAD), New Animal Drug Application (NADA) information, extra-label use requirements, and/or veterinarian prescriptions.

The Discharger shall also submit acute toxicity test information on any new chemical or drug applied in solution for immersive treatment in accordance with methods specified in the USEPA *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA 600/4-90/027) using *Ceriodaphnia dubia* to determine the No Observed Adverse Effect Level (NOAEL) and Lowest Observed Adverse Effect Level (LOAEL).

b. Waste Disposal

- i. Collected screenings 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.
- ii. All aquaculture drugs and chemicals not discharged to receiving waters in accordance with the provisions of this Order shall be disposed of in an environmentally safe manner, according to label guidelines, Material Safety

Data Sheet guidelines, and the Discharger's BMP Plan. Any other form of disposal requires approval from the Executive Officer.

7. Compliance Schedules - Not Applicable

VII.COMPLIANCE DETERMINATION

- A. TSS Effluent Limitations (Sections IV.A.1.a and IV.A.2.a).** Compliance with the final effluent limitations for TSS required in Limitations and Discharge Requirements sections IV.A.1.a and IV.A.2.a shall be ascertained by ~~24-hour composite~~grab samples. Compliance with effluent limitations required in Limitations and Discharge Requirements section IV.A.1.a and IV.A.2.a for percent removal shall be calculated using the arithmetic mean of TSS in effluent samples collected over a monthly period as a percentage of the arithmetic mean of the values for influent samples collected at approximately the same times during the same period.
- B. Average Dry Weather Flow Effluent Limitations (Sections IV.A.1.c and IV.A.2.c).** The average dry weather discharge flow represents the daily average flow when groundwater is at or near normal and runoff is not occurring. Compliance with the average dry weather flow effluent limitations will be determined annually based on the average daily flow over three consecutive dry weather months (e.g., July, August, and September).
- C. Mass Effluent Limitations.** The mass effluent limitations contained in the Final Effluent Limitations in Sections IV.A.1.a and IV.A.2.a are based on the permitted average dry weather flow and calculated as follows:

$$\text{Mass (lbs/day)} = \text{Flow (MGD)} \times \text{Concentration (mg/L)} \times 8.34 \text{ (conversion factor)}$$

If the effluent flow exceeds the permitted average dry weather flow during wet-weather seasons, the effluent mass limitations contained in Final Effluent Limitations in Sections IV.A.1.a and IV.A.2.a shall not apply. If the effluent flow is below the permitted average dry weather flow during wet-weather seasons, the effluent mass limitations do apply.

D. Priority Pollutant Effluent Limitations. Compliance with effluent limitations for priority pollutants shall be determined using sample reporting protocols defined in Attachment A and Attachment E of this Order. For purposes of reporting and administrative enforcement by the Central Valley Water Board and the State Water Board, the Discharger shall be deemed out of compliance with effluent limitations if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the reporting level (RL).

ATTACHMENT A - DEFINITIONS

Arithmetic Mean (μ)

Also called the average, is the sum of measured values divided by the number of samples. For ambient water concentrations, the arithmetic mean is calculated as follows:

Arithmetic mean = $\mu = \Sigma x / n$ where: Σx is the sum of the measured ambient water concentrations, and n is the number of samples.

Average Monthly Effluent Limitation (AMEL)

The highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Effluent Limitation (AWEL)

The highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Bioaccumulative

Those substances taken up by an organism from its surrounding medium through gill membranes, epithelial tissue, or from food and subsequently concentrated and retained in the body of the organism.

Carcinogenic

Pollutants are substances that are known to cause cancer in living organisms.

Coefficient of Variation (CV)

CV is a measure of the data variability and is calculated as the estimated standard deviation divided by the arithmetic mean of the observed values.

Daily Discharge

Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g., concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of 1 day (a calendar day or other 24-hour period defined as a day) or by the arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

Detected, but Not Quantified (DNQ)

DNQ are those sample results less than the RL, but greater than or equal to the laboratory's MDL.

Dilution Credit

Dilution Credit is the amount of dilution granted to a discharge in the calculation of a water quality-based effluent limitation, based on the allowance of a specified mixing zone. It is calculated from the dilution ratio or determined through conducting a mixing zone study or modeling of the discharge and receiving water.

Effluent Concentration Allowance (ECA)

ECA is a value derived from the water quality criterion/objective, dilution credit, and ambient background concentration that is used, in conjunction with the coefficient of variation for the effluent monitoring data, to calculate a long-term average (LTA) discharge concentration. The ECA has the same meaning as waste load allocation (WLA) as used in USEPA guidance (Technical Support Document For Water Quality-based Toxics Control, March 1991, second printing, EPA/505/2-90-001).

Enclosed Bays

Enclosed Bays means indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays include, but are not limited to, Humboldt Bay, Bodega Harbor, Tomales Bay, Drake's Estero, San Francisco Bay, Morro Bay, Los Angeles-Long Beach Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay. Enclosed bays do not include inland surface waters or ocean waters.

Estimated Chemical Concentration

The estimated chemical concentration that results from the confirmed detection of the substance by the analytical method below the ML value.

Estuaries

Estuaries means waters, including coastal lagoons, located at the mouths of streams that serve as areas of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and seawater. Estuarine waters included, but are not limited to, the Sacramento-San Joaquin Delta, as defined in Water Code section 12220, Suisun Bay, Carquinez Strait downstream to the Carquinez Bridge, and appropriate areas of the Smith, Mad, Eel, Noyo, Russian, Klamath, San Diego, and Otay rivers. Estuaries do not include inland surface waters or ocean waters.

Inland Surface Waters

All surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Instantaneous Maximum Effluent Limitation

The highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

Instantaneous Minimum Effluent Limitation

The lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

Maximum Daily Effluent Limitation (MDEL)

The highest allowable daily discharge of a pollutant, over a calendar day (or 24-hour period). For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Median

The middle measurement in a set of data. The median of a set of data is found by first arranging the measurements in order of magnitude (either increasing or decreasing order). If the number of measurements (n) is odd, then the median = $X_{(n+1)/2}$. If n is even, then the median = $(X_{n/2} + X_{(n/2)+1})/2$ (i.e., the midpoint between the $n/2$ and $n/2+1$).

Method Detection Limit (MDL)

MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in 40 CFR Part 136, Attachment B, revised as of 3 July 1999.

Minimum Level (ML)

ML is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

Mixing Zone

Mixing Zone is a limited volume of receiving water that is allocated for mixing with a wastewater discharge where water quality criteria can be exceeded without causing adverse effects to the overall water body.

Not Detected (ND)

Sample results which are less than the laboratory's MDL.

Ocean Waters

The territorial marine waters of the State as defined by California law to the extent these waters are outside of enclosed bays, estuaries, and coastal lagoons. Discharges to ocean waters are regulated in accordance with the State Water Board's California Ocean Plan.

Persistent Pollutants

Persistent pollutants are substances for which degradation or decomposition in the environment is nonexistent or very slow.

Pollutant Minimization Program (PMP)

PMP means waste minimization and pollution prevention actions that include, but are not limited to, product substitution, waste stream recycling, alternative waste management methods, and education of the public and businesses. The goal of the PMP shall be to reduce all potential sources of a priority pollutant(s) through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, to maintain the effluent concentration at or below the water quality-based effluent limitation. Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The Central Valley Water Board may consider cost effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Plan, if required pursuant to Water Code section 13263.3(d), shall be considered to fulfill the PMP requirements.

Pollution Prevention

Pollution Prevention means any action that causes a net reduction in the use or generation of a hazardous substance or other pollutant that is discharged into water and includes, but is not limited to, input change, operational improvement, production process change, and product reformulation (as defined in Water Code section 13263.3). Pollution prevention does not include actions that merely shift a pollutant in wastewater from one environmental medium to another environmental medium, unless clear environmental benefits of such an approach are identified to the satisfaction of the State or Regional Water Board.

Reporting Level (RL)

RL is the ML (and its associated analytical method) chosen by the Discharger for reporting and compliance determination from the MLs included in this Order. The MLs included in this Order correspond to approved analytical methods for reporting a sample result that are selected by the Central Valley Water Board either from Appendix 4 of the SIP in accordance with section 2.4.2 of the SIP or established in accordance with section 2.4.3 of the SIP. The ML is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied to the ML in the computation of the RL.

Satellite Collection System

The portion, if any, of a sanitary sewer system owned or operated by a different public agency than the agency that owns and operates the wastewater treatment facility that a sanitary sewer system is tributary to.

Source of Drinking Water

Any water designated as municipal or domestic supply (MUN) in a Regional Water Board Basin Plan.

Standard Deviation (σ)

Standard Deviation is a measure of variability that is calculated as follows:

$$\sigma = (\sum[(x - \mu)^2]/(n - 1))^{0.5}$$

where:

x is the observed value;

μ is the arithmetic mean of the observed values; and

n is the number of samples.

Toxicity Reduction Evaluation (TRE)

TRE is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate. (A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

ATTACHMENT B - MAPS

Figure B-1
Aquatic Center Site Layout

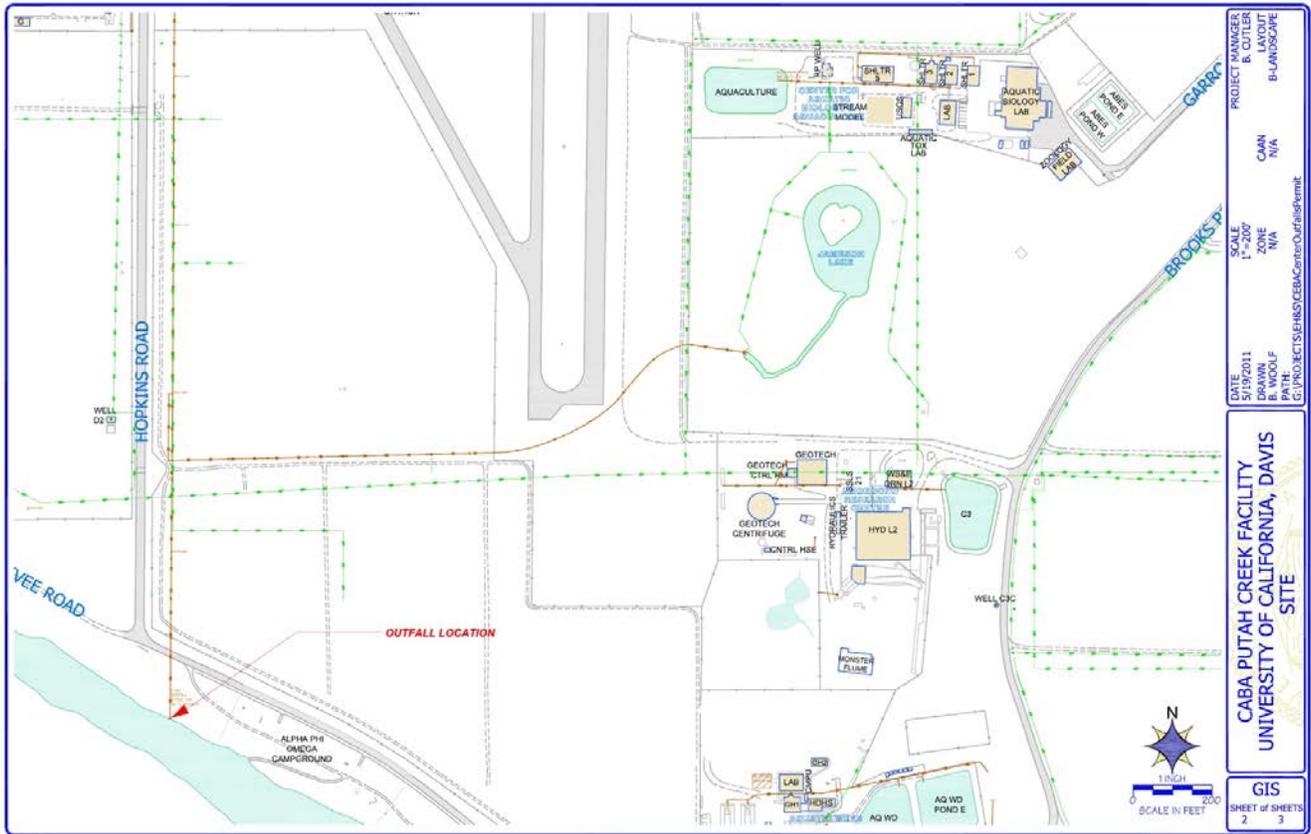
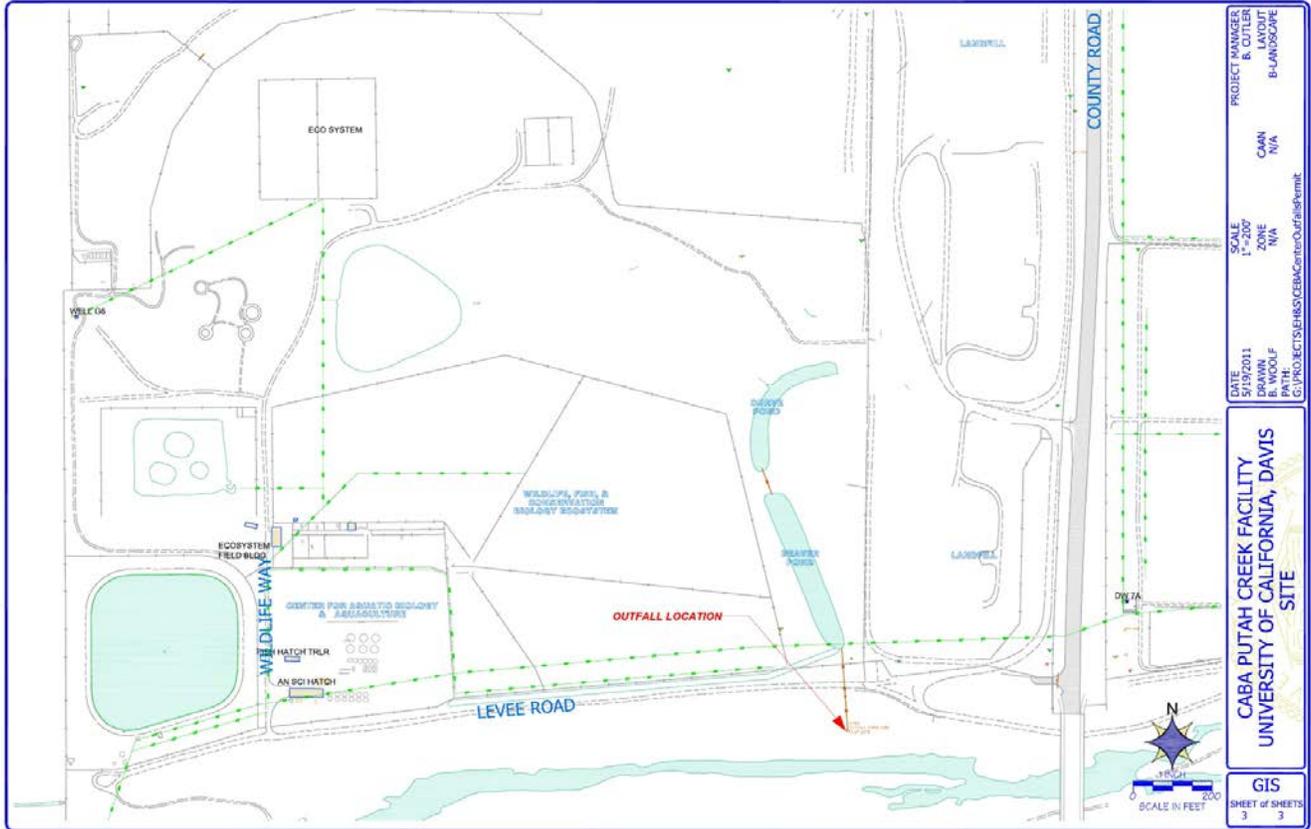
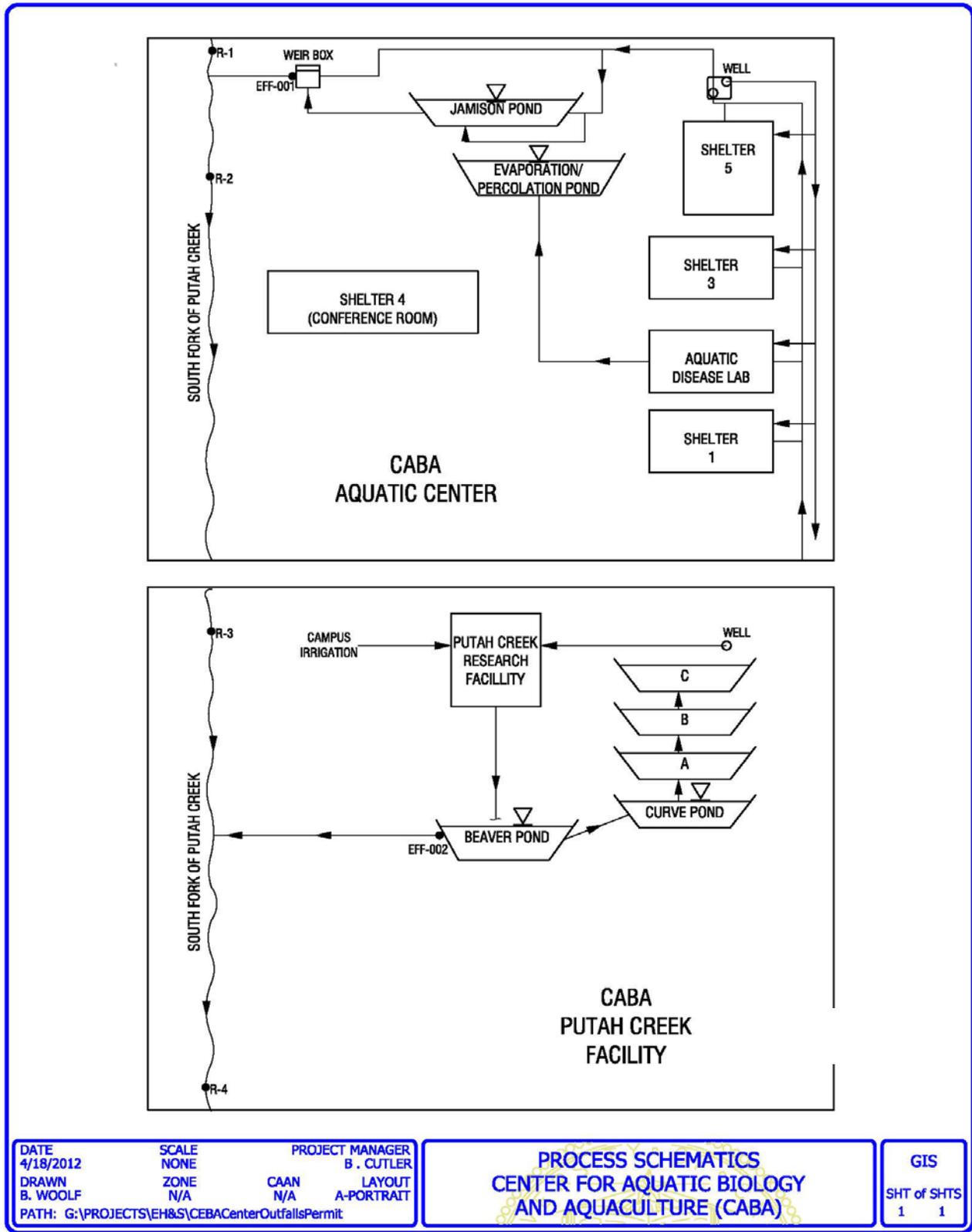
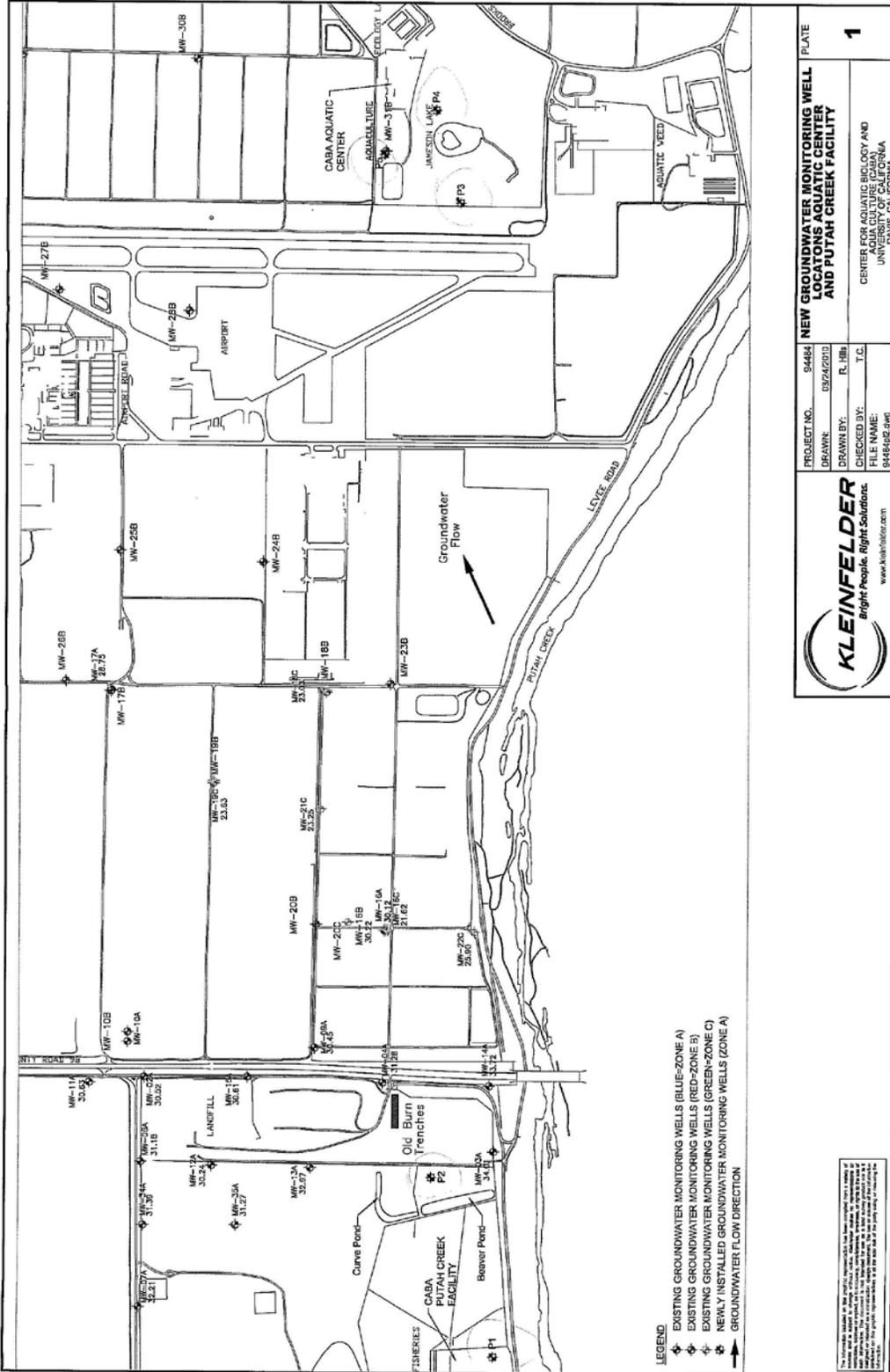


Figure B-2
Putah Creek Facility Site Layout



ATTACHMENT C - FLOW SCHEMATIC





ATTACHMENT D - STANDARD PROVISIONS

VIII. STANDARD PROVISIONS - PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code (Water Code) and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (40 CFR 122.41(a).)
2. The Discharger shall comply with effluent standards or prohibitions established under section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not yet been modified to incorporate the requirement.
(40 CFR 122.41(a)(1).)

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order. (40 CFR 122.41(c))

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment. (40 CFR 122.41(d))

D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order.

(40 CFR 122.41(e).)

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges. (40 CFR 122.41(g))
2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations. (40 CFR 122.5(c))

F. Inspection and Entry

The Discharger shall allow the Regional Water Board, State Water Board, United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to (40 CFR 122.41(i); Water Code section 13383):

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order (40 CFR 122.41(i)(1));
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (40 CFR 122.41(i)(2));

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (40 CFR 122.41(i)(3)); and
4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location. (40 CFR 122.41(i)(4))

G. Bypass

1. Definitions

- a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. (40 CFR 122.41(m)(1)(i))
- b. "Severe property damage" means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production.
(40 CFR 122.41(m)(1)(ii))

2. Bypass not exceeding limitations. The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions - Permit Compliance I.G.3, I.G.4, and I.G.5 below. (40 CFR 122.41(m)(2))

3. Prohibition of bypass. Bypass is prohibited, and the Regional Water Board may take enforcement action against a Discharger for bypass, unless (40 CFR 122.41(m)(4)(i)):
 - a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage (40 CFR 122.41(m)(4)(i)(A));

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Standard Provisions - Permit Compliance I.H.2 below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. (40 CFR 122.41(n)(2))
2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that (40 CFR 122.41(n)(3)):
 - a. An upset occurred and that the Discharger can identify the cause(s) of the upset (40 CFR 122.41(n)(3)(i));
 - b. The permitted facility was, at the time, being properly operated (40 CFR 122.41(n)(3)(ii));
 - c. The Discharger submitted notice of the upset as required in Standard Provisions - Reporting V.E.2.b below (24-hour notice) (40 CFR 122.41(n)(3)(iii)); and
 - d. The Discharger complied with any remedial measures required under Standard Provisions - Permit Compliance I.C above. (40 CFR 122.41(n)(3)(iv))
3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof. (40 CFR 122.41(n)(4))

IX. STANDARD PROVISIONS - PERMIT ACTION

A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or

termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition. (40 CFR 122.41(f))

B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain a new permit. (40 CFR 122.41(b))

C. Transfers

This Order is not transferable to any person except after notice to the Regional Water Board. The Regional Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the Water Code. (40 CFR 122.41(l)(3) and 122.61)

X. STANDARD PROVISIONS - MONITORING

- A.** Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 CFR 122.41(j)(1))
- B.** Monitoring results must be conducted according to test procedures under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503 unless other test procedures have been specified in this Order. (40 CFR 122.41(j)(4) and 122.44(i)(1)(iv))

XI. STANDARD PROVISIONS - RECORDS

- A.** Except for records of monitoring information required by this Order related to the Discharger's sewage sludge use and disposal activities, which shall be retained for a period of at least 5 years (or longer as required by 40 CFR Part 503), the Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring

instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Regional Water Board Executive Officer at any time. (40 CFR 122.41(j)(2))

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements (40 CFR 122.41(j)(3)(i));
2. The individual(s) who performed the sampling or measurements (40 CFR 122.41(j)(3)(ii));
3. The date(s) analyses were performed (40 CFR 122.41(j)(3)(iii));
4. The individual(s) who performed the analyses (40 CFR 122.41(j)(3)(iv));
5. The analytical techniques or methods used (40 CFR 122.41(j)(3)(v)); and
6. The results of such analyses. (40 CFR 122.41(j)(3)(vi))

C. Claims of confidentiality for the following information will be denied (40 CFR 122.7(b)):

1. The name and address of any permit applicant or Discharger (40 CFR 122.7(b)(1));
and
2. Permit applications and attachments, permits and effluent data.
(40 CFR 122.7(b)(2))

XII. STANDARD PROVISIONS - REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the Regional Water Board, State Water Board, or USEPA within a reasonable time, any information which the Regional Water Board, State Water Board, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the Regional Water Board, State Water Board, or USEPA copies of records required to be kept by this Order. (40 CFR 122.41(h); Wat. Code, § 13267)

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or USEPA shall be signed and certified in accordance with Standard Provisions - Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below.
(40 CFR 122.41(k))

2. All permit applications shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures.
(40 CFR 122.22(a)(1))

3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described

in Standard Provisions - Reporting V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

- a. The authorization is made in writing by a person described in Standard Provisions - Reporting V.B.2 above (40 CFR 122.22(b)(1));
 - b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) (40 CFR 122.22(b)(2)); and
 - c. The written authorization is submitted to the Regional Water Board and State Water Board. (40 CFR 122.22(b)(3))
4. If an authorization under Standard Provisions - Reporting V.B.3 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions - Reporting V.B.3 above must be submitted to the Regional Water Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 CFR 122.22(c))
5. Any person signing a document under Standard Provisions - Reporting V.B.2 or V.B.3 above shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.”

(40 CFR 122.22(d))

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment E) in this Order. (40 CFR 122.22(l)(4))
2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices.
(40 CFR 122.41(l)(4)(i))
3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under 40 CFR Part 136 or, in the case of sludge use or disposal, approved under 40 CFR Part 136 unless otherwise specified in 40 CFR Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional Water Board.
(40 CFR 122.41(l)(4)(ii))
4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order.
(40 CFR 122.41(l)(4)(iii))

D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date. (40 CFR 122.41(l)(5))

E. Twenty-Four Hour Reporting

1. The Discharger shall notify the Office of Emergency Services of any noncompliance that may endanger health or the environment within two (2) hours from the time the Discharger becomes aware of the circumstances. The Discharger shall notify the Central Valley Water Board of the noncompliance by telephone or fax within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall also be provided to the Central Valley Water Board within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. (40 CFR 122.41(l)(6)(i))
2. The following shall be included as information that must be reported within 24 hours under this paragraph (40 CFR 122.41(l)(6)(ii)):
 - a. Any unanticipated bypass that exceeds any effluent limitation in this Order.
(40 CFR 122.41(l)(6)(ii)(A))
 - b. Any upset that exceeds any effluent limitation in this Order.
(40 CFR 122.41(l)(6)(ii)(B))
3. The Regional Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours. (40 CFR 122.41(l)(6)(iii))

F. Planned Changes

The Discharger shall give notice to the Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when (40 CFR 122.41(l)(1)):

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in 40 CFR 122.29(b) (40 CFR 122.41(l)(1)(i)); or
2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are subject neither to effluent limitations in this Order nor to notification requirements under 40 CFR 122.42(a)(1) (see Additional Provisions—Notification Levels VII.A.1). (40 CFR 122.41(l)(1)(ii))
3. The alteration or addition results in a significant change in the Discharger's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. (40 CFR 122.41(l)(1)(iii))

G. Anticipated Noncompliance

The Discharger shall give advance notice to the Regional Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with General Order requirements. (40 CFR 122.41(l)(2))

H. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions - Reporting V.C, V.D, and V.E above at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision - Reporting V.E above. (40 CFR 122.41(l)(7))

I. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any

report to the Regional Water Board, State Water Board, or USEPA, the Discharger shall promptly submit such facts or information. (40 CFR 122.41(l)(8))

XIII. STANDARD PROVISIONS - ENFORCEMENT

- A. The Regional Water Board is authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387.

XIV. ADDITIONAL PROVISIONS - NOTIFICATION LEVELS

A. Non-Municipal Facilities

Existing manufacturing, commercial, mining, and silvicultural Dischargers shall notify the Regional Water Board as soon as they know or have reason to believe (40 CFR 122.42(a)):

1. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" (40 CFR 122.42(a)(1)):
 - a. 100 micrograms per liter ($\mu\text{g/L}$) (40 CFR 122.42(a)(1)(i));
 - b. 200 $\mu\text{g/L}$ for acrolein and acrylonitrile; 500 $\mu\text{g/L}$ for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and 1 milligram per liter (mg/L) for antimony (40 CFR 122.42(a)(1)(ii));
 - c. Five (5) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 CFR 122.42(a)(1)(iii)); or
 - d. The level established by the Regional Water Board in accordance with 40 CFR 122.44(f). (40 CFR 122.42(a)(1)(iv))
2. That any activity has occurred or will occur that would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant that is not limited in this

Order, if that discharge will exceed the highest of the following "notification levels" (40 CFR 122.42(a)(2)):

- a. 500 micrograms per liter ($\mu\text{g/L}$) (40 CFR 122.42(a)(2)(i));
- b. 1 milligram per liter (mg/L) for antimony (40 CFR 122.42(a)(2)(ii));
- c. Ten (10) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 CFR 122.42(a)(2)(iii)); or
- d. The level established by the Regional Water Board in accordance with section 122.44(f). (40 CFR 122.42(a)(2)(iv))

ATTACHMENT E - MONITORING AND REPORTING PROGRAM

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ATTACHMENT E - MONITORING AND REPORTING PROGRAM

Title 40 of the Code of Federal Regulations (CFR), section 122.48 (40 CFR 122.48) requires that all NPDES permits specify monitoring and reporting requirements. California Water Code (Water Code) sections 13267 and 13383 also authorize the Regional Water Quality Control Board (Central Valley Water Board) to require technical and monitoring reports. This Monitoring and Reporting Program establishes monitoring and reporting requirements, which implement the federal and California regulations.

I. GENERAL MONITORING PROVISIONS

- A. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring locations specified below and, unless otherwise specified, before the monitored flow joins or is diluted by any other waste stream, body of water, or substance. Monitoring locations shall not be changed without notification to and the approval of the Central Valley Water Board.
- B. Effluent samples shall be taken downstream of the last addition of wastes to the treatment or discharge works where a representative sample may be obtained prior to mixing with the receiving waters. Samples shall be collected at such a point and in such a manner to ensure a representative sample of the discharge.
- C. Chemical, bacteriological, and bioassay analyses of any material required by this Order shall be conducted by a laboratory certified for such analyses by the Department of Public Health (DPH). Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the Central Valley Water Board. In the event a certified laboratory is not available to the Discharger for any onsite field measurements such as pH, turbidity, temperature and residual chlorine, such analyses performed by a noncertified laboratory will be accepted provided a Quality Assurance-Quality Control Program is instituted by the laboratory. A manual containing the steps followed in this program for any onsite field measurements such as pH, DO, turbidity, temperature and

residual chlorine must be kept onsite in the treatment facility laboratory and shall be available for inspection by Central Valley Water Board staff. The Discharger must demonstrate sufficient capability (qualified and trained employees, properly calibrated and maintained field instruments, etc.) to adequately perform these field measurements. The Quality Assurance-Quality Control Program must conform to USEPA guidelines or to procedures approved by the Central Valley Water Board.

- D. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary, at least yearly, to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year to ensure continued accuracy of the devices.
- E. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this Monitoring and Reporting Program.
- F. Laboratories analyzing monitoring samples shall be certified by DPH, in accordance with the provision of Water Code section 13176, and must include quality assurance/quality control data with their reports.
- G. The Discharger shall conduct analysis on any sample provided by USEPA as part of the Discharge Monitoring Quality Assurance (DMQA) program. The results of any such analysis shall be submitted to USEPA's DMQA manager.
- H. The Discharger shall file with the Central Valley Water Board technical reports on self-monitoring performed according to the detailed specifications contained in this Monitoring and Reporting Program.
- I. The results of all monitoring required by this Order shall be reported to the Central Valley Water Board, and shall be submitted in such a format as to allow direct comparison with the limitations and requirements of this Order. Unless otherwise

specified, discharge flows shall be reported in terms of the monthly average and the daily maximum discharge flows.

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Table E-1. Monitoring Station Locations

Discharge Point Name	Monitoring Location Name	Monitoring Location Description
001	EFF-001	A point downstream from the last connection through which wastes can be admitted to the outfall prior to the discharge from the Aquatic Center to the South Fork of Putah Creek (formerly D-001).
002	EFF-002	A point downstream from the last connection through which wastes can be admitted to the outfall and prior to discharge from the Putah Creek Facility to either the South Fork of Putah Creek (formerly D-002) <u>or adjacent wetland ponds.</u>
--	RSW-001	South Fork of Putah Creek, 50 feet upstream of the Aquatic Center discharge point (formerly R-1).
--	RSW-002	South Fork of Putah Creek, 150 feet downstream of the Aquatic Center discharge point (formerly R-2).
--	RSW-003	South Fork of Putah Creek, 50 feet upstream of the Putah Creek Facility discharge point (formerly R-3).
--	RSW-004	South Fork of Putah Creek, 150 feet downstream of the Putah Creek Facility discharge point (formerly R-4).
--	PND-001	At a location representative of the wastewater contained in Jameson Pond.
--	PND-002	At a location representative of the wastewater contained in Beaver Pond.
--	PND-003	At a location representative of the wastewater contained in Curve Pond.
--	PND-004	At a location representative of the wastewater contained in an unnamed evaporation/percolation pond used by the aquatic disease laboratory for treatment of chlorine disinfected wastewater.
--	PND-005	<u>Unnamed wetland channels adjacent to Jamison Pond</u>
--	PND-006	<u>Unnamed wetland pond adjacent to Curve Pond</u>
--	GW-001	At the upgradient groundwater monitoring well (formerly P1) located at the Putah Creek Facility.
--	GW-002	At the downgradient groundwater monitoring well (formerly P2) located at the Putah Creek Facility.

--	GW-003	At the upgradient groundwater monitoring well (formerly P3) located at the Aquatic Center.
--	GW-004	At the downgradient groundwater monitoring well (formerly P4) located at the Aquatic Center.
--	GW-005	At the groundwater monitoring well (formerly P5) located immediately adjacent to the percolation/evaporation pond at the Aquatic Center.
=	<u>GW-006</u>	<u>At downgradient monitoring well MW-13A located adjacent to the Putah Creek Facility</u>
=	<u>GW-007</u>	<u>At downgradient monitoring well MW-35A located adjacent to the Putah Creek Facility</u>

III. INFLUENT MONITORING REQUIREMENTS - NOT APPLICABLE

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Locations EFF-001 and EFF-002

1. The Discharger shall monitor at Monitoring Locations EFF-001 and EFF-002 as follows. If more than one analytical test method is listed for a given parameter, the Discharger must select from the listed methods and corresponding Minimum Level:

Table E-2. Effluent Monitoring at Monitoring Locations EFF-001 and EFF-002

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	mgd	Meter	Continuous	1
Conventional Pollutants				
Total Suspended Solids	mg/L	Grab	1/Quarter	1
	lbs/day	Calculate	1/Quarter	--
pH	Standard Units	Grab	1/Week ²	1,2
Priority Pollutants				
Chromium (VI)	µg/L	Grab	1/Month	1,3
Non-Conventional Pollutants				
Chloride	mg/L	Grab	1/Month	1
Chlorine, Total Residual	mg/L	Meter	1/Day ⁴	1
Electrical Conductivity (at 25°C)	µmhos/cm	Grab	1/Quarter	1
Formaldehyde	mg/L	Grab	1/Week ⁵	1
Hardness (as CaCO ₃)	mg/L	Grab	1/Month	1
Iron, Total Recoverable	µg/L	Grab	1/Quarter	1
Settleable Solids	ml/L	Grab	1/Quarter	1
Temperature	°C	Grab	1/Week	1,2
Total Dissolved Solids	mg/L	Grab	1/Month	1
Priority Pollutants and Other	µg/L	Grab	⁶	1,3

Constituents of Concern				
Drugs and Other Chemicals (see Section IX.A below)	--	--	--	--
Whole Effluent Toxicity (see Section V. below)	--	--	--	--

- ¹ Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136.
- ² A hand-held field meter may be used, provided the meter utilizes a USEPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer's instructions. A calibration and maintenance log for each meter used for monitoring required by this Monitoring and Reporting Program shall be maintained at the Facility.
- ³ For priority pollutant constituents with effluent limitations, detection limits shall be below the effluent limitations. If the lowest minimum level (ML) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Plan or SIP) is not below the effluent limitation, the detection limit shall be the lowest ML. For priority pollutant constituents without effluent limitations, the detection limits shall be equal to or less than the lowest ML published in Appendix 4 of the SIP. Sampling and analysis of bis (2-ethylhexyl) phthalate shall be conducted using ultra-clean techniques that eliminate the possibility of sample contamination.
- ⁴ Monitor daily whenever chlorine or chlorine containing substances are used for cleaning and sanitizing.
- ⁵ During periods when the parameter is added to the waters of the Facility, concentrations shall be measured during use at the frequency specified. For example, if the required monitoring frequency is 1/Week, then only one sample would be required during the week the parameter is added to the waters, regardless of how often the parameter is added during the week.
- ⁶ Priority pollutants and other constituents of concern shall be sampled one time at least 180 days but no more than 365 days prior to expiration of this Order, and shall be conducted concurrently with upstream receiving water monitoring. The Discharger is not required to conduct effluent monitoring for priority pollutants that have already been sampled during the same year as the priority pollutant sampling, as required in Table E-2. See Attachment I for more detailed requirements related to performing the priority pollutant monitoring.

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. Acute Toxicity Testing. The Discharger shall conduct acute toxicity testing to determine whether the effluent is contributing acute toxicity to the receiving water. The Discharger shall meet the following acute toxicity testing requirements at each monitoring location:

1. Monitoring Frequency - The Discharger shall perform annual acute toxicity testing.
2. Sample Types - For static non-renewal and static renewal testing, the samples shall be grab samples and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent Monitoring Locations EFF-001 and EFF-002.
3. Test Species - Test species shall be fathead minnows (*Pimephales promelas*).
4. Methods - The acute toxicity testing samples shall be analyzed using EPA-821-R-02-012, Fifth Edition. Temperature, total residual chlorine, and pH shall be recorded at the time of sample collection. No pH adjustment may be made unless approved by the Executive Officer.
5. Test Failure - If an acute toxicity test does not meet all test acceptability criteria, as specified in the test method, the Discharger must re-sample and re-test as soon as possible, not to exceed 7 days following notification of test failure.

B. Chronic Toxicity Testing. The Discharger shall conduct three species chronic toxicity testing to determine whether the effluent is contributing chronic toxicity to the receiving water. The Discharger shall meet the following chronic toxicity testing requirements:

1. Monitoring Frequency - The Discharger shall perform annual three species chronic toxicity testing.
2. Sample Types - Effluent samples shall be grab samples and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent Monitoring Locations EFF-001 and EFF-002. The receiving water control shall be a grab sample obtained from receiving water monitoring locations RSW-001 (for Monitoring Location EFF-001) and RSW-003 (for Monitoring Location EFF-002), as identified in this Monitoring and Reporting Program.
3. Sample Volumes - Adequate sample volumes shall be collected to provide renewal water to complete the test in the event that the discharge is intermittent.

4. Test Species - Chronic toxicity testing measures sublethal (e.g., reduced growth, reproduction) and/or lethal effects to test organisms exposed to an effluent compared to that of the control organisms. The Discharger shall conduct chronic toxicity tests with:
 - The cladoceran, water flea, *Ceriodaphnia dubia* (survival and reproduction test);
 - The fathead minnow, *Pimephales promelas* (larval survival and growth test); and
 - The green alga, *Selenastrum capricornutum* (growth test).

5. Methods - The presence of chronic toxicity shall be estimated as specified in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition*, EPA/821-R-02-013, October 2002.

6. Reference Toxicant - As required by the SIP, all chronic toxicity tests shall be conducted with concurrent testing with a reference toxicant and shall be reported with the chronic toxicity test results.

7. Dilutions - The chronic toxicity testing shall be performed using the dilution series identified in the table, below. The receiving water control shall be used as the diluent (unless the receiving water is toxic).

Table E-3. Chronic Toxicity Testing Dilution Series

	Dilutions (%)					Controls	
	100	75	50	25	12.5	Receiving Water	Laboratory Water
% Effluent	100	75	50	25	12.5	0	0
% Receiving Water	0	25	50	75	87.5	100	0
% Laboratory Water	0	0	0	0	0	0	100

8. Test Failure - The Discharger must re-sample and re-test as soon as possible, but no later than fourteen (14) days after receiving notification of a test failure. A test failure is defined as follows:

- a. The reference toxicant test or the effluent test does not meet all test acceptability criteria as specified in the *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition*, EPA/821-R-02-013, October 2002 (Method Manual), and its subsequent amendments or revisions; or
- b. The percent minimum significant difference (PMSD) measured for the test exceeds the upper PMSD bound variability criterion in Table 6 on page 52 of the Method Manual. (A retest is only required in this case if the test results do not exceed the monitoring trigger specified in the Special Provision at section VI. 2.a.iii. of the Order.)

C. WET Testing Notification Requirements. The Discharger shall notify the Central Valley Water Board within 24-hours after the receipt of test results exceeding the monitoring trigger during regular or accelerated monitoring, or an exceedance of the acute toxicity effluent limitation.

D. WET Testing Reporting Requirements. All toxicity test reports shall include the contracting laboratory's complete report provided to the Discharger and shall be in accordance with the appropriate "Report Preparation and Test Review" sections of the method manuals. At a minimum, whole effluent toxicity monitoring shall be reported as follows:

1. **Chronic WET Reporting.** Regular chronic toxicity monitoring results shall be reported to the Central Valley Water Board within 30 days following completion of the test, and shall contain, at a minimum:
 - a. The results expressed in TU_c, measured as 100/NOEC, and also measured as 100/LC50, 100/EC25, 100/IC25, and 100/IC50, as appropriate.
 - b. The statistical methods used to calculate endpoints;
 - c. The statistical output page, which includes the calculation of the percent minimum significant difference (PMSD);

- d. The dates of sample collection and initiation of each toxicity test; and
- e. The results compared to the numeric toxicity monitoring trigger.

Additionally, the monthly discharger self-monitoring reports shall contain an updated chronology of chronic toxicity test results expressed in TUC, and organized by test species, type of test (survival, growth or reproduction), and monitoring frequency, i.e., either quarterly, monthly, accelerated, or Toxicity Reduction Evaluation (TRE).

2. **Acute WET Reporting.** Acute toxicity test results shall be submitted with the monthly discharger self-monitoring reports and reported as percent survival.
3. **TRE Reporting.** Reports for TREs shall be submitted in accordance with the schedule contained in the Discharger's approved TRE Workplan.
4. **Quality Assurance (QA).** The Discharger must provide the following information for QA purposes:
 - a. Results of the applicable reference toxicant data with the statistical output page giving the species, NOEC, LOEC, type of toxicant, dilution water used, concentrations used, PMSD, and dates tested.
 - b. The reference toxicant control charts for each endpoint, which include summaries of reference toxicant tests performed by the contracting laboratory.
 - c. Any information on deviations or problems encountered and how they were dealt with.

VI. LAND DISCHARGE MONITORING REQUIREMENTS—NOT APPLICABLE

See section IX.B Treatment Pond Monitoring

VII. RECLAMATION MONITORING REQUIREMENTS - NOT APPLICABLE

VIII. RECEIVING WATER MONITORING REQUIREMENTS - SURFACE WATER AND GROUNDWATER

A. Monitoring Locations RSW-001, RSW-002, RSW-003, and RSW-004

1. The Discharger shall monitor the South Fork of Putah Creek at Monitoring Locations RSW-001, RSW-002, RSW-003, and RSW-004 as follows:

Table E-4. Receiving Water Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Dissolved Oxygen	mg/L	Grab	1/Quarter	1
pH	standard units	Grab	1/Quarter	1
Hardness	mg/L	Grab	1/Quarter	1
Temperature	°F	Grab	1/Quarter	1
Turbidity	NTU	Grab	1/Quarter	1
Electrical Conductivity	µmhos/cm	Grab	1/Quarter	1
Visual Observations ²	--	Grab	1/Quarter	--
Priority Pollutants and Other Constituents of Concern ³	µg/L	Grab	4	1

¹ Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136.

² Visual observations shall include floating or suspended matter, discoloration, bottom deposits, aquatic life, visible films, sheens or coatings, fungi, slimes or objectionable coatings, and any other potential nuisance conditions.

³ See list of Priority Pollutants and Other Constituents of Concern in Attachment I.

⁴ Priority pollutants and other constituents of concern shall be sampled one time at least 180 days but no more than 365 days prior to expiration of this Order at Monitoring Locations RSW-001 and RSW-003 and shall be conducted concurrently with effluent monitoring for priority pollutants.

B. Monitoring Locations GW-001, GW-002, GW-003, GW-004, GW-005, GW-006, and GW-0075

1. Prior to construction and/or beginning a sampling program of any new groundwater monitoring wells, the Discharger shall submit plans and specifications to the Central Valley Water Board for approval. Once installed, all new wells shall be added to the monitoring network (which currently consists of Monitoring Well Nos. GW-001 through GW-0057) and shall be sampled and analyzed according to the schedule below. All samples shall be collected using approved EPA methods. Water table elevations shall be calculated to determine groundwater gradient and direction of flow.

2. Prior to sampling, the groundwater elevations shall be measured and the wells shall be purged of at least three well volumes until temperature, pH, and electrical conductivity have stabilized. Depth to groundwater shall be measured to the nearest 0.01 feet. Groundwater monitoring at GW-001 through GW-0057, and any new groundwater monitoring wells shall include, at a minimum, the following:

Table E-5. Groundwater Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Depth to Groundwater	±0.01 feet	Measurement	1/Quarter	--
Groundwater Elevation ¹	±0.01 feet	Calculated	1/Quarter	--
Gradient	feet/feet	Calculated	1/Quarter	--
Gradient Direction	degrees	Calculated	1/Quarter	--
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/Quarter	²
Total Dissolved Solids	mg/L	Grab	1/Quarter	²

Chromium (VI) ³	µg/L	Grab	1/Quarter	2
Chromium (III) ³	µg/L	Grab	1/Quarter	2

¹ Groundwater elevation shall be determined based on depth-to-water measurements from a surveyed measuring point elevation on the well. The groundwater elevation shall be used to calculate the direction and gradient of groundwater flow, which must be reported.

² Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136.

³ Analytical samples shall be collected at least one week prior to the first discharge to the Aquatic Center wetland channels. Only collect samples from monitoring wells GW-003, GW-004, and GW-005, which surround the Aquatic Center wetland channels. Analytical samples shall be collected at least one week prior to the first discharge to the Putah Creek Facility wetlands. Only collect samples from monitoring wells GW-001, GW-006, and GW-007, which surround the Putah Creek Facility wetlands. After the initial sampling event continue to collect quarterly samples in conjunction with other quarterly monitoring requirements.

IX. OTHER MONITORING REQUIREMENTS

A. Drugs and Other Chemicals Report

1. The information listed below shall be submitted for all aquaculture drugs or chemicals used at the Facilities. This information shall be reported at monthly intervals and submitted with the monthly self-monitoring reports using the drug and chemical usage report table found in Attachment J of this Order. At such time as the Discharger is required to begin submitting self-monitoring reports electronically, the Discharger shall continue to submit paper copies of the monthly drug and chemical use reports to the Central Valley Water Board.

- a. The name(s) and active ingredient(s);
- b. The date(s) of application;
- c. The purpose(s) for the application;
- d. The treatment concentration(s), duration of treatment, whether the treatment was static or flush, amount in gallons or pounds used, and the flow in cubic feet per second (cfs) in the treatment units;

- e. The total flow through the facility to the South Fork of Putah Creek after mixing with the treated water;
- f. The estimated concentration in the effluent at the point of discharge.

2. Calculation of Concentration

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

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

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

Example: Oxytetracycline Concentration

$$C = 0.2 \text{ mg/L} \times (0.45 \text{ mgd} \div 0.74 \text{ mgd})$$

$$C = 0.2 \text{ mg/L} \times 0.61$$

$$C = \underline{0.12 \text{ mg/L Oxytetracycline at the point of discharge}}$$

- 3. This information shall be submitted in the monthly discharge monitoring report, if applicable. 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.

B. Treatment Pond Monitoring

1. Monitoring Locations PND-001, PND-002, PND-003, PND-005, and PND-003006

The Discharger shall monitor each of the settling ponds at Monitoring Locations PND-001 (Jameson Pond), PND-002 (Beaver Pond), and PND-003 (Curve Pond), PND-005 (Aquatic Center wetland channels), and PND-006 (Putah Creek Wetland Ponds) in accordance with the requirements in the following table.

Table E-6. Pond Monitoring Requirements (PND-001, PND-002, PND-003, PND-005, and PND-003006)

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
pH	standard units	Grab ²	1/Month	1
Dissolved Oxygen	mg/L	Grab ³	1/Month	1
Freeboard	feet	--	1/Month	--
Color	--	Observation	1/Month	--
Odors	--	Observation	1/Month	--
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/Month	1

¹ Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136.

² A hand-held field meter may be used, provided the meter utilizes a USEPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer's instructions. A calibration and maintenance log for each meter used for monitoring required by this Monitoring and Reporting Program shall be maintained at the Facility.

³ Measured within the upper 1-foot of water in the pond.

2. Monitoring Location PND-004

The Discharger shall monitor the evaporation/percolation pond at Monitoring Location PND-004 in accordance with the requirements in the following table.

Table E-7. Pond Monitoring Requirements (PND-004)

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
pH	standard units	Grab ²	1/Month	1
Dissolved Oxygen	mg/L	Grab ³	1/Month	1
Freeboard	feet	--	1/Month	--
Color	--	Observation	1/Month	--
Odors	--	Observation	1/Month	--
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/Month	1
Total Trihalomethanes	µg/L	Calculate ⁴	1/Month	--
Bromodichloromethane	µg/L	Grab	1/Month	1, 5
Bromoform	µg/L	Grab	1/Month	1, 5
Chloroform	µg/L	Grab	1/Month	1, 5
Dibromochloromethane	µg/L	Grab	1/Month	1, 5

¹ Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136.

² A hand-held field meter may be used, provided the meter utilizes a USEPA-approved algorithm/method and is calibrated and maintained in accordance with the manufacturer's instructions. A calibration and maintenance log for each meter used for monitoring required by this Monitoring and Reporting Program shall be maintained at the Facility.

³ Measured within the upper 1-foot of water in the pond.

⁴ Total trihalomethanes shall be derived as the sum of the concentrations of bromodichloromethane, bromoform, chloroform, dibromochloromethane.

⁵ In accordance with 22 CCR §64533, Table 64533-A, the analytical detection limit for purposes of reporting shall be 0.5 µg/L.

X. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.

2. Upon written request of the Central Valley Water Board, the Discharger shall submit a summary monitoring report. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year(s).
3. **Compliance Time Schedules.** For compliance time schedules included in the Order, the Discharger shall submit to the Central Valley Water Board, on or before each compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board by letter when it returns to compliance with the compliance time schedule.
4. The Discharger shall report to the Central Valley Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "*Emergency Planning and Community Right to Know Act*" of 1986.

B. Self Monitoring Reports (SMRs)

1. The Discharger shall continue to submit eSMRs using the State Water Board's CIWQS Program Web site (<http://www.waterboards.ca.gov/ciwqs/index.html>). The Discharger shall maintain sufficient staffing and resources to ensure it submits eSMRs during the effective duration of this Order. This includes provision of training and supervision of individuals (e.g., Discharger personnel or consultant) on how to prepare and submit eSMRs.
2. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-8. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On...	Monitoring Period	SMR Due Date
Continuous	Permit effective date	All	First day of second calendar month following month of sampling.
1/Day	Permit effective date	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.	First day of second calendar month following month of sampling.
1/Week	Permit effective date	Sunday through Saturday	First day of second calendar month following month of sampling.
1/Month	Permit effective date	First day of calendar month through last day of calendar month	First day of second calendar month following month of sampling.
1/Quarter	Permit effective date	1 January through 31 March 1 April through 30 June 1 July through 30 September 1 October through 31 December	1 May 1 August 1 November 1 February (of the following year)
1/Year	Permit effective date	1 January through 31 December	1 February (of the following year)

3. Reporting Protocols. The Discharger shall report with each sample result the applicable reported Minimum Level (ML) and the current Method Detection Limit (MDL), as determined by the procedure in 40 CFR Part 136.

The Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

- a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).
- b. Sample results less than the RL, 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.

For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (+ a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

- c. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.
 - d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve.
4. The Discharger shall submit SMRs in accordance with the following requirements:
- a. The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does

- not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.
- b. The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall clearly identify violations of the WDRs; discuss corrective actions taken or planned; and the proposed time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.
 - c. SMRs must be submitted to the Central Valley Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

Regional Water Quality Control Board
Central Valley Region
NPDES Compliance and Enforcement Unit
11020 Sun Center Dr., Suite #200
Rancho Cordova, CA 95670-6114

5. Reports must clearly show when discharging to Monitoring Location EFF-001 or other permitted discharge locations. Reports must show the date and time that the discharge started and stopped at each location.

C. Discharge Monitoring Reports (DMRs) - Not Applicable

D. Other Reports

1. The Discharger shall report the results of any special studies, acute and chronic toxicity testing, TRE/TIE, PMP, and Pollution Prevention Plan required by Special Provisions VI.C of this Order. The Discharger shall submit reports with the first monthly SMR scheduled to be submitted on or immediately following the report due date.

2. Within 60 days of permit adoption, the Discharger shall submit a report outlining minimum levels, method detection limits, and analytical methods for approval, with a goal to achieve detection levels below applicable water quality criteria. At a minimum, the Discharger shall comply with the monitoring requirements for CTR constituents as outlined in section 2.3 and 2.4 of the SIP.
3. **Annual Groundwater Monitoring Reports.** For each groundwater monitoring parameter/constituent identified in the Monitoring and Reporting Program, the report shall present a summary of monitoring data, calculation of the concentration in background monitoring wells, and a comparison of background groundwater quality to that in wells used to monitor the facility. Determination shall be based on data from at least eight consecutive quarterly (or more frequent) groundwater monitoring events. For each monitoring parameter/constituent, the report shall compare the calculated concentrations of each compliance monitoring well with the calculated background concentration.
4. **Annual Operations Report.** By 30 January of each year, the Discharger shall submit a written report to the Executive Officer containing the following:
 - a. The names, certificate grades, and general responsibilities of all persons employed at the Facility.
 - b. The names and telephone numbers of persons to contact regarding the plant for emergency and routine situations.
 - c. A statement certifying when the flow meter(s) and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration.
 - d. A statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the wastewater treatment plant as currently constructed and operated, and the dates when these documents were last revised and last reviewed for adequacy.

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

ATTACHMENT F - FACT SHEET

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ATTACHMENT F - FACT SHEET

As described in the Findings in section II of this Order, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

This Order has been prepared under a standardized format to accommodate a broad range of discharge requirements for Dischargers in California. Only those sections or subsections of this Order that are specifically identified as “not applicable” have been determined not to apply to this Discharger. Sections or subsections of this Order not specifically identified as “not applicable” are fully applicable to this Discharger.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the Facility.

Table F-1. Facility Information

WDID	5A570800003
Discharger	University of California
Name of Facility	Center for Aquatic Biology and Aquaculture
Facility Address	One Shields Avenue
	Davis, CA 95616
	Yolo County
Facility Contact, Title and Phone	Paul Lutes, Facility Manager, (530)752-8160
Authorized Person to Sign and Submit Reports	Jill Parker, Associate Vice Chancellor-Safety Services, (530)752-2599
Mailing Address	One Shields Avenue, Environmental Health & Safety, University of California, Davis Davis, CA 95616
Billing Address	Same as Mailing Address
Type of Facility	Aquatic Biology Research Facility
Major or Minor Facility	Minor

Threat to Water Quality	2
Complexity	C
Pretreatment Program	N
Reclamation Requirements	Not Applicable
Facility Permitted Flow	1.44 mgd (Discharge Point No. 001) 1.44 mgd (Discharge Point No. 002)
Facility Design Flow	1.44 mgd (Discharge Point No. 001) 1.44 mgd (Discharge Point No. 002)
Watershed	Sacramento River
Receiving Water	South Fork Putah Creek
Receiving Water Type	Inland Surface Water

A. The University of California (hereinafter Discharger) is the owner and operator of the Center for Aquatic Biology and Aquaculture (CABA), composed of the Aquatic Center and the Putah Creek Facility (hereinafter Facilities), an aquatic biology research facility.

For the purposes of this Order, references to the “discharger” or “permittee” in applicable federal and state laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

B. The Facilities discharge wastewater to the South Fork of Putah Creek, a tributary to the Sacramento-San Joaquin Delta and a water of the United States, and is currently regulated by Order No. R5-2006-0126 which was adopted on 8 December 2006 and expires on 1 December 2011. Order No. R5-2006-0126 was administratively extended on 9 September 2011.

C. The Discharger filed a report of waste discharge (ROWD) and submitted an application for renewal of its Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit on 2 June 2011. A site visit was conducted on 17 May 2011, to observe operations and collect additional data to develop permit limitations and conditions.

II. FACILITY DESCRIPTION

The Discharger owns and operates the Facilities, which consists of two fish research facilities, the Aquatic Center and the Putah Creek Facility. The Discharger's Aquaculture and Fisheries Program conducts research focused on toxicology, nutrition, physiology, ecology, engineering, endocrinology, infectious diseases, and other related subjects. Many different species of vertebrate species are studied (trout, salmon, sturgeon, minnows, carp, catfish, striped bass, delta smelt, etc.) using basic aquatic animal husbandry methods, as well as invertebrates and plants. Operations at the Facility have a large amount of variability in test species, habitat, and other conditions. The type of research conducted at the Facility is dependent on current research needs and the Discharger's success in acquiring associated grant funding. The Facilities operate primarily on a flow-through basis, with only limited recirculating operations. Various aquaculture drugs and chemicals are used on an as-needed basis to clean fish tanks; treat fish for parasites, fungal growths, and bacterial infections; and to anesthetize fish prior to spawning or "tagging" processes.

The Aquatic Center operations also include an aquatic disease laboratory. This laboratory is operated in collaboration with the Department of Fish and Game (DFG) to (1) perform research related to determining the natural resistance to current or developing disease issues associated with aquaculture operations (e.g., whirling disease), and (2) perform research for the treatment of current or developing diseases.

Source waters for the Aquatic Center include a dedicated groundwater well; source waters for the Putah Creek Facility include a dedicated groundwater well and surface water extracted from Lake Berryessa. The source waters extracted from groundwaters are high in nitrogen gas and low in dissolved oxygen. The Discharger removes nitrogen and increases the dissolved oxygen of the source water by routing it through stripping towers and pressurizing it prior to use in the laboratories associated with the Facilities.

The design daily average flow capacity for the Aquatic Center is 1.44 million gallons per day (mgd) and the design daily average flow capacity for the Putah Creek Facility is also 1.44 mgd.

A. Description of Wastewater and Biosolids Treatment or Controls

A portion of the wastewater from the Aquatic Center is produced at an aquatic disease laboratory. Due to the nature of activities at the aquatic disease laboratory, effluent from the aquatic disease laboratory is chlorine disinfected, as required by DFG, and routed to a hydraulically isolated evaporation/percolation pond for disposal. The wastewater flow from the laboratory is continuous, and the majority of time this continuous wastewater discharge to the evaporation/percolation pond is for maintaining the aquatic species to be used for research. The frequency of discharge of wastewater during research is periodic, and depends on the need for the research. Discharge to surface water from the pond is not authorized under this Order.

The remainder of the wastewater from the Aquatic Center is collected at a sump pump station prior to being circulated through a settling pond, known as Jamison Pond, prior to discharge through a weir box into the on-campus storm drain line and then to the South Fork of Putah Creek at Discharge Point No. 001. Until just recently, the Discharger had the option to divert the effluent at the sump around Jamison Pond and directly to the weir box. However, in 2010, the control valves for the Jamison Pond bypass line have been closed. The Discharger will no longer be allowed to bypass Jamison Pond unless the bypass is in accordance with Discharge Prohibition III.C contained in the Order.

The Discharger plans on rerouting effluent from the Aquatic Center Facility, with the exception of effluent from the Aquatic Center aquatic disease laboratory, to a series of interconnected wetland channels each 25 meters long, 0.75 meters wide, and 0.6 meters deep, then routing the effluent to Jamison Pond where it will completely settle and then discharge to Putah Creek via Discharge Point No. 001. The rerouting of effluent to the adjacent land allows for completion of a research project and study the

feasibility of reducing the amount of wastewater discharged to Putah Creek. The first research project is a study of the effect of light levels on the establishment and growth of submersed aquatic plant propagules of one native species and one invasive species. There is no discharge of water from the wetland channels to surface water.

Wastewater produced at the Putah Creek Facility is circulated through two settling ponds, known as Beaver Pond and Curve Pond, and discharged to the South Fork of Putah Creek at Discharge Point No. 002. ~~Until recently, the~~ effluent from the Putah Creek Facility could ~~may~~ be diverted to a series of ponds used for wetlands and ecosystems studies, on an as-needed basis. ~~However, there is no longer a discharge of wastewater into these research wetlands. Therefore, this Order does not authorize the discharge of wastewater into the research wetlands.~~ There is no discharge of water from the wetlands to surface water.

B. Discharge Points and Receiving Waters

1. The Aquatic Center is located in Section 19, T8N, R2E, MDB&M. The Putah Creek Facility is located in Section 24, T8N, R1E, MDB&M as shown in Attachment B, a part of this Order.
2. Treated wastewater is discharged at Discharge Point Nos. 001 and 002 to the South Fork of Putah Creek, a water of the United States and a tributary to the Sacramento-San Joaquin Delta. Discharge Point No. 001 is located at a point latitude 38° 31' 29.33" N and longitude 121° 47' 24.54" W. Discharge Point No. 002 is located at a point latitude 38° 31' 36.66" N and longitude 121° 48' 13.59" W.

C. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data

Effluent limitations contained in Order No. R5-2006-0126 for discharges from Discharge Point No. 001 (Monitoring Location EFF-001) and representative self monitoring report (SMR) data from the term of Order No. R5-2006-0126 are as follows:

Table F-2. Historic Effluent Limitations and Monitoring Data: Discharge Point No. 001

Parameter	Units	Effluent Limitation			Monitoring Data (From December 2006 To December 2010)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
Biochemical Oxygen Demand (5- day @ 20° C)	mg/L	10	15	25	5.9	5.9	5.9
	lbs/day ¹	62	93	154	NR	NR	NR
Total Suspended Solids	mg/L	25	40	65	17	17	17
	lbs/day ¹	154	247	401	NR	NR	NR
Formaldehyde	mg/L	0.6	--	1.3 ²	ND	ND	ND
	lbs/day ¹	3.7	--	8.0 ²	NR	--	NR
Electrical Conductivity @ 25° C	µmhos/cm	800	--	--	765	--	--
Cadmium, Total Recoverable	µg/L	2.2	--	4.3	ND	--	ND
	lbs/day ¹	0.01	--	0.03	NR	--	NR
Chromium (Total)	µg/L	50	--	100.5	25	--	25
	lbs/day ¹	0.3	--	0.6	NR	--	NR
Mercury, Total Recoverable	µg/L	0.05	--	0.10	0.0032	--	0.0032
	lbs/day ¹	0.00030	--	0.00060	NR	--	NR
Selenium, Total Recoverable	µg/L	4.1	--	8.2	4.1	--	4.1
	lbs/day ¹	0.03	--	0.05	NR	--	NR
Settleable Solids	ml/L	--	--	0.1	--	--	ND
Chlorine Residual	µg/L	--	11 ³	18.04	--	0.03	0.03
	lbs/day ¹	--	0.066 ³	0.11	--	NR	NR

Parameter	Units	Effluent Limitation			Monitoring Data (From December 2006 To December 2010)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
pH	standard units	6.5 - 8.5			7.9 - 9.0		
Average Daily Dry Weather Discharge Flow	MGD	--	--	1.44	--	--	0.9489
Acute Toxicity	% survival	--	--	⁴	--	--	100 ⁵

NR - Not Reported

ND - Reported as Non-Detect

¹ The mass emissions rate is based on a long-term average discharge of 0.73 MGD.

² Applied as an instantaneous maximum effluent limitation.

³ Applied as a 4-day average effluent limitation.

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

Minimum for any one bioassay: 70%

Median for any three or more consecutive bioassays: 90%

⁵ Represents the minimum value reported.

Effluent limitations contained in Order No. R5-2006-0126 for discharges from Discharge Point No. 002 (Monitoring Location EFF-002) and representative monitoring data from the term of Order No. R5-2006-0126 are as follows:

Table F-3. Historic Effluent Limitations and Monitoring Data: Discharge Point No. 002

Parameter	Units	Effluent Limitation			Monitoring Data (From December 2006 To December 2010)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
Biochemical Oxygen Demand (5- day @ 20° C)	mg/L	10	15	25	2	2	2
	lbs/day ¹	52	78	129	NR	NR	NR
Total Suspended Solids	mg/L	25	40	65	14	14	14
	lbs/day ¹	129	207	336	NR	NR	NR
Formaldehyde	mg/L	0.6	--	1.3 ²	0.01	--	0.01
	lbs/day ¹	3.1	--	6.7 ²	NR	--	NR
Electrical Conductivity @ 25° C	µmhos/cm	800	--	--	823	--	--
Cadmium, Total Recoverable	µg/L	2.2	--	4.3	ND	--	ND
	lbs/day ¹	0.01	--	0.02	NR	--	NR
Chromium (Total)	µg/L	50	--	100.5	24	--	24
	lbs/day ¹	0.26	--	0.52	NR	--	NR
Selenium, Total Recoverable	µg/L	4.1	--	8.2	ND	--	ND
	lbs/day ¹	0.02	--	0.04	NR	--	NR
Settleable Solids	ml/L	--	--	0.1	--	--	ND
Chlorine Residual	µg/L	--	11 ³	18.04	--	ND	ND
	lbs/day ¹	--	0.056 ³	0.093	--	NR	NR
pH	standard units	6.5 - 8.5			7.9 - 8.4		

Parameter	Units	Effluent Limitation			Monitoring Data (From December 2006 To December 2010)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
Average Daily Dry Weather Discharge Flow	MGD	--	--	1.44	--	--	0.7544
Acute Toxicity	% survival	--	--	⁴	--	--	90 ⁵

NR - Not Reported

ND - Reported as Non-Detect

¹ The mass emissions rate is based on a long-term average discharge of 0.62 MGD.

² Applied as an instantaneous maximum effluent limitation.

³ Applied as a 4-day average effluent limitation.

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

Minimum for any one bioassay: 70%

Median for any three or more consecutive bioassays: 90%

⁵ Represents the minimum value reported.

D. Compliance Summary

1. Compliance with Effluent Limitations

During the term of Order No. R5-2006-0126, the Discharger exceeded numeric effluent limitations at Discharge Point No. 002. On 26 June 2007 and on 19 October 2009, there were exceedances of the Discharger's average monthly electrical conductivity limitation with measured effluent values of 823 µmhos/cm and 819 µmhos/cm, respectively.

2. Compliance Evaluation Inspections (CEIs)

A CEI was conducted at the Facilities on 23 January 2009. The major findings of the inspection were as follows:

- a. The inspector determined that records and reports were maintained in accordance with the requirements of Order No. R5-2006-0126 and that all systems appeared to be in satisfactory operating condition and functioning properly.
- b. The inspector found that effluent flow was not being monitored in accordance with the requirements of Order No. R5-2006-0126. Specifically, the Discharger possessed an inoperable flow meter at Discharge Point No. 001 and no flow meter was installed at Discharge Point No. 002.
- c. The inspector found that the Discharger had failed to properly monitor Oxytetracycline during use.
- d. The inspector found that inconsistent records were kept with respect to effluent, receiving water, and pond monitoring.

E. Planned Changes

The Discharger has indicated that the groundwater well that provides the water supply for the Aquatic Center will be replaced with one of the domestic wells on the University of California-Davis campus during the term of this Order. This replacement is necessary because the output from the current well has been declining due to fouling of the intake screens, and is no longer able to meet the water demand of the Aquatic Center. According to the Discharger, the new water supply for the Aquatic Center should have no significant impact on existing wastewater characteristics.

The Discharger plans on rerouting effluent from the Aquatic Center Facility to adjacent land to allow for completion of a research project and study the feasibility of reducing the amount of wastewater discharged to Putah Creek, then routing the effluent to Jamison Pond where it is allowed to completely settle and then discharge to Putah Creek. The research project is a study of both the effect of light levels on the establishment and growth of submersed aquatic plant propagules of one native species

and one invasive species and the feasibility of reducing wastewater discharged to Putah Creek.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this Order are based on the applicable plans, policies, and regulations identified in the Findings in section II of this Order. The applicable plans, policies, and regulations relevant to the discharge include the following:

A. Legal Authorities

This Order is issued pursuant to regulations in the Clean Water Act (CWA) and the California Water Code (Water Code) as specified in the Finding contained at section II.C of this Order.

B. California Environmental Quality Act (CEQA)

This Order meets the requirements of CEQA as specified in the Finding contained at section II.E of this Order.

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans.** This Order implements the following water quality control plans as specified in the Finding contained at section II.H of this Order.

a. *Water Quality Control Plan, Fourth Edition (Revised October 2011), for the Sacramento and San Joaquin River Basins* (Basin Plan)

b. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** This Order implements the NTR and CTR as specified in the Finding contained at section II.I of this Order.

c. **State Implementation Policy (SIP).** This Order implements the SIP as specified in the Finding contained at section II.J of this Order.

- d. Alaska Rule.** This Order is consistent with the Alaska Rule as specified in the Finding contained at section II.L of this Order.
- e. Antidegradation Policy.** As specified in the Finding contained at section II.N of this Order and as discussed in detail in the Fact Sheet (Attachment F, Section IV.D.4.), the discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board (State Water Board) Resolution 68-16.
- f. Anti-Backsliding Requirements.** This Order is consistent with anti-backsliding policies as specified in the Finding contained at section II.O of this Order. Compliance with the anti-backsliding requirements is discussed in the Fact Sheet (Attachment F, Section IV.D.3).
- g. Storm Water Requirements.** USEPA promulgated federal regulations for storm water on 16 November 1990 in 40 CFR Parts 122, 123, and 124. The NPDES Industrial Storm Water Program regulates storm water discharges from industrial activities. Aquatic research facilities are not applicable industries under the storm water program and are not required to be covered under the State Water Board's General Industrial Storm Water Permit.
- h. Endangered Species Act.** This Order is consistent with the Endangered Species Act as specified in the Finding contained at section II.P of this Order.

D. Impaired Water Bodies on CWA 303(d) List

1. Under section 303(d) of the 1972 CWA, states, territories and authorized tribes are required to develop lists of water quality limited segments. The waters on these lists do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. On 12 November 2010 the United States Environmental Protection Agency (USEPA) gave partial approval to California's 2010 section 303(d) List of Water Quality Limited Segments. The Basin Plan references this list of Water Quality Limited Segments (WQLSs), which are defined as "*...those sections of lakes, streams, rivers*

or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources (40 CFR Part 130, et seq.).” The Basin Plan also states, *“Additional treatment beyond minimum federal standards will be imposed on dischargers to [WQLSs]. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.”* The listing for Putah Creek between Solano Lake and the Putah Creek Sinks includes boron and mercury.

2. **Total Maximum Daily Loads (TMDLs).** USEPA requires the Regional Water Board to develop TMDLs for each 303(d) listed pollutant and water body combination. There are no final TMDLs applicable to Putah Creek and this Discharger.

E. Other Plans, Policies, and Regulations

1. Regulations for Use of Aquaculture Drugs and Chemicals

The 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. It is the responsibility of the Discharger to know which aquaculture drugs and chemicals may be used in the Facilities 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 Order.

Drugs and chemicals used in aquaculture are strictly regulated by the U.S. Food and Drug Administration (FDA) through the Federal Food, Drug, and Cosmetic Act (FFDCA; 21 U.S.C 301-392). 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 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.

The Discharger may legally obtain and use aquaculture drugs in one of several ways. Some aquaculture drugs and chemicals used at the Facilities in the Central Valley Region are approved by the FDA for certain aquaculture uses on certain aquatic species. Others have an exemption from this approval process when used under certain specified conditions. 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.

- 2. Title 27, California Code of Regulations (CCR), section 20005 et seq. (hereafter Title 27)**

Some discharges of wastewater to land are exempt from the requirements of Title 27, CCR, based on section 20090 et seq. Title 27 CCR section 20090(b) contains an exemption for discharges of wastewater to land where the discharge is covered by WDRs, the discharge is in compliance with the Basin Plan, and the discharge does not need to be managed as a hazardous waste. This Order serves as WDRs for the discharges and the discharges do not need to be managed as hazardous waste. The remainder of this section discusses the evaluation performed to determine if the discharges are in compliance with the Basin Plan.

Wastewater from the Aquatic Center is circulated through an unlined settling pond (Jamison Pond) prior to discharge to receiving water. Wastewater from the Putah Creek Facility is circulated through two unlined settling ponds (Beaver Pond and Curve Pond) prior to discharge to the receiving water. Additionally, effluent from the aquatic disease laboratory is discharged to a hydraulically isolated evaporation/percolation pond for disposal.

In order to qualify for an exemption from Title 27 under section 20090(b), the Discharger must demonstrate compliance with the Basin Plan, which requires that constituent concentrations in the groundwater do not exceed either the Basin Plan's groundwater water quality objectives or background groundwater concentrations, whichever is greater. In accordance with Order No. R5-2006-0012, the Discharger installed a groundwater monitoring well network in 2007 that consisted of five monitoring wells (P1 through P5). According to the Discharger's 23 March 2010 *Updated Statistical Analysis Report University of California Davis Center for Aquatic Biology and Aquaculture Davis, California* (Kleinfelder), monitoring well P1 is up gradient of Beaver and Curve Ponds and monitoring well P2 is down gradient of Beaver and Curve Ponds. Further, monitoring well P3 is up gradient of Jamison Pond and the evaporation/percolation pond; monitoring well P4 is down gradient of Jamison Pond and monitoring well P5 is adjacent to and down gradient of the evaporation/percolation pond. A map showing the location of the groundwater monitoring wells is provided in Attachment C of this Order.

During the period from October 2007 through October 2010, the Discharger sampled the five groundwater monitoring wells for over 30 constituents, including pH, oxygen-demanding substances (chemical oxygen demand, total organic carbon), nutrients (total nitrogen, nitrates, total kjeldahl nitrogen, phosphorus), electrical conductivity (EC), oxytetracycline, formaldehyde, methylene blue active substances (MBAS), Title 22 metals (arsenic, cadmium, chromium, copper, lead, mercury, nickel, and zinc), and standard minerals (boron, calcium, iron, magnesium, potassium, sodium, chloride, manganese, total alkalinity, and hardness). Two methods were used to examine compliance with the Basin Plan. First, data was analyzed to determine whether reported constituent concentrations exceeded applicable Basin Plan objectives. Second, for those constituents that were found to exceed applicable objectives, further analysis was performed to determine whether there was a statistical difference between up gradient and down gradient constituent concentrations (to determine if the discharges from the ponds were responsible for increases in groundwater constituent concentrations).

Based on the evaluation of constituent concentrations, only four constituents indicated concentrations above applicable water quality objectives at the down gradient well locations. These four constituents include nitrate, EC, total dissolved solids (TDS), and iron in the areas around each of the ponds, and MBAS in the area around the Putah Creek Facility.

Next, a t-test was used to determine if there was a statistical difference between the constituent concentrations measured in the down gradient wells, as compared to the constituent concentrations measured in up gradient background wells. For those pollutants where a statistical difference was determined, a comparison of the means was performed to find out if the difference was due to an increase over background (i.e., up gradient well concentration). The following tables present the results of the analyses.

Table F-4. Groundwater Monitoring Data: Beaver and Curve Ponds

Parameter	Applicable Objective	Up Gradient (Well P1) Mean	Down Gradient (Well P2) Mean
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Parameter	Applicable Objective	Up Gradient (Well P1) Mean	Down Gradient (Well P2) Mean
Electrical Conductivity (µmhos/cm)	700	696	871
Total Dissolved Solids (mg/L)	450	403	523

Table F-5. Groundwater Monitoring Data: Jamison Pond

Parameter	Applicable Objective	Up Gradient (Well P3) Mean	Down Gradient (Well P4) Mean
Electrical Conductivity (µmhos/cm)	700	819	749
Total Dissolved Solids (mg/L)	450	475	435

Table F-6. Groundwater Monitoring Data: Evaporation/Percolation Pond

Parameter	Applicable Objective	Up Gradient (Well P3) Mean	Down Gradient (Well P5) Mean
Electrical Conductivity (µmhos/cm)	700	819	739
Total Dissolved Solids (mg/L)	450	475	436

Based on this analysis, both EC and TDS concentrations down gradient of the Putah Creek Facility (i.e., Beaver and Curve Ponds) were the only constituents that consistently exceeded up gradient background well concentrations as well as applicable water quality objectives. However, for Jameson Pond and the evaporation/percolation pond, the down gradient EC and TDS concentrations were below background (up gradient) concentrations.

On average, the EC and TDS effluent concentrations from the ponds are either less than or roughly equivalent to the applicable objectives. Therefore it is uncertain whether percolation from the ponds would be the cause of increased salinity in the local groundwater. Further, the Central Valley Water Board considers Putah Creek in the vicinity of the Facilities to be a losing stream, such that the groundwater flow direction for the shallow groundwater is away from the creek. Therefore, an increase in groundwater salinity from up gradient to down gradient monitoring wells could be the result of natural mineralization of percolated Putah Creek water moving through the soil. The Central Valley Water Board concludes

that the ponds are not contributing to the increased salinity down gradient and are in compliance with the Basin Plan with respect to salinity.

Considering all data, the Central Valley Water Board finds that the discharges from the settling ponds and evaporation/percolation pond to groundwater are in compliance with the Basin Plan. Therefore, the discharge meets the pre-conditions for an exemption to the requirements of Title 27 pursuant to Title 27 CCR section 20090(b). This Order requires the Discharger to continue groundwater monitoring to evaluate impacts to groundwater and assure protection of beneficial uses.

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

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 CWA and amendments thereto are applicable to the discharge.

The CWA mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law [33 U.S.C., §1311(b)(1)(C); 40 CFR 122.44(d)(1)]. NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met. This requirement applies to narrative criteria as well as to criteria specifying maximum amounts of particular pollutants. Pursuant to federal regulations, 40 CFR 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that *“are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality.”*

Federal regulations, 40 CFR 122.44(d)(1)(vi), further provide that *“[w]here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits.”*

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations in the Code of Federal Regulations: 40 CFR 122.44(a) requires that permits include applicable technology-based limitations and standards; and 40 CFR 122.44(d) requires that permits include WQBELs to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established. The Basin Plan at page IV-17.00, contains an implementation policy, "*Policy for Application of Water Quality Objectives*", that specifies that the Regional Water Board "*will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives.*" This Policy complies with 40 CFR 122.44(d)(1). With respect to narrative objectives, the Central Valley Water Board must establish effluent limitations using one or more of three specified sources, including: (1) USEPA's published water quality criteria, (2) a proposed state criterion (i.e., water quality objective) or an explicit state policy interpreting its narrative water quality criteria (i.e., the Central Valley Water Board's "*Policy for Application of Water Quality Objectives*")(40 CFR 122.44(d)(1)(vi)(A), (B) or (C)), or (3) an indicator parameter.

The Basin Plan includes numeric site-specific water quality objectives and narrative objectives for toxicity, chemical constituents, discoloration, radionuclides, and tastes and odors. The narrative toxicity objective states: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at III-8.00) The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The narrative chemical constituents objective states that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At minimum, "*...water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)*" in Title 22 of CCR. The Basin Plan further states that, to protect all beneficial uses, the Central Valley Water Board may apply limits more stringent than

MCLs. The narrative tastes and odors objective states: *“Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.”*

A. Discharge Prohibitions

1. Prohibition III.A (No discharge of waste other than that described in this Order).

This prohibition is based on Water Code Section 13260 that requires filing of a report of waste discharge (ROWD) before discharges can occur. The Discharger submitted a ROWD for the discharges described in this Order; therefore, discharges not described in this Order are prohibited.

2. Prohibition III.B (No discharge of unauthorized aquaculture drugs and chemicals).

This Order authorizes the use of a number of aquaculture drugs and chemicals. Consistent with the previous Order, the discharge of other aquaculture drugs is prohibited unless specifically authorized in accordance with requirements contained in the Order.

3. Prohibition III.C (No bypasses or overflow of untreated wastewater, except under the conditions at CFR Part 122.41(m)(4)). As stated in section I.G of Attachment D, Standard Provisions, this Order prohibits bypass from any portion of the treatment facility. Federal regulations, 40 CFR 122.41(m), define “bypass” as the intentional diversion of waste streams from any portion of a treatment facility. This section of the federal regulations, 40 CFR 122.41(m)(4), prohibits bypass unless it is unavoidable to prevent loss of life, personal injury, or severe property damage. In considering the Central Valley Water Board’s prohibition of bypasses, the State Water Board adopted a precedential decision, Order No. WQO 2002-0015, which cites the federal regulations, 40 CFR 122.41(m), as allowing bypass only for essential maintenance to assure efficient operation.

4. Prohibition III.D (No controllable condition shall create a nuisance). This prohibition is based on Water Code Section 13050 that requires water quality

objectives established for the prevention of nuisance within a specific area. The Basin Plan prohibits conditions that create a nuisance, or otherwise adversely affect beneficial uses.

5. **Prohibition III.E (No discharge of any wastewater or any alcohol, formaldehyde, phenolic resin, or melamine resin storage tank spill catchment basin water or residue).** This prohibition is based on Water Code Section 13050 that requires water quality objectives established for the prevention of nuisance within a specific area. The Basin Plan prohibits conditions that create a nuisance, or otherwise adversely affect beneficial uses. This prohibition has been retained from the previous Order.
6. **Prohibition III.F (No discharge to ground surface, surface waters, or surface water drainage courses).** This is a general prohibition that allows the Discharger to discharge waste only in accordance with waste discharge requirements. It is based on Sections 301 and 402 of the federal CWA and Water Code Section 13263. This prohibition has been retained from the previous Order.
7. **Prohibition III.G (No discharge of “hazardous” wastes).** This prohibition applies to waste classified as “hazardous” as defined in Sections 2521(a) and 2522(a) of 23 CCR Division 3, Chapter 15 to surface water or ponds is prohibited. The Basin Plan prohibits conditions that create a nuisance, or otherwise adversely affect beneficial uses. This prohibition has been retained from the previous Order.
8. **Prohibition III.H (No discharge of wastewater from evaporation/percolation ponds to surface waters).** This prohibition allows the Discharger to discharge waste only in accordance with waste discharge requirements, and is based on Sections 301 and 402 of the federal CWA and Water Code Section 13263. Based on the recommendations from DFG regarding operation of the Infectious Disease Lab, wastewaters must be contained and isolated from discharge to surface waters by directing wastewaters to the evaporation/percolation pond. This prohibition has been retained from the previous Order.

- 9. Prohibition III.I (No inclusion of pollutant free wastewater shall cause improper operation of the Facility's systems).** This prohibition is based on CFR Part 122.41 et seq. that requires the proper design and operation of treatment facilities. This prohibition, based on Provision I.2 in the previous Order, has been retained.
- 10.** Based on changes to operations at the Facilities, Prohibitions A.2, A.3, and A.4 in Order No. R5-2006-0126 have not been retained in this Order.
- ~~a.~~ Prohibition A.2 prohibited the discharge of wastewater from the wetland and ecosystem ponds to surface waters. Until recently, effluent from the Putah Creek Facility could be diverted to a series of ponds used for wetlands and ecosystems studies. However there is no longer a discharge of wastewater into these research wetlands. Therefore, this Order does not authorize the discharge of wastewater into the research wetlands and the prohibition is no longer applicable to the Facility.
- b.a.** Prohibition A.3 prohibited the discharge of mercury in an amount greater than the existing discharge. Order No. R5-2006-0126 regulated mercury due to the potential use at the Facilities as a component of experimental materials. The Discharger has stated in its ROWD that mercury will not be used at the Facilities as a possible experimental agent. Therefore, the prohibition is no longer applicable and has not been retained in this Order. If the Discharger wishes to use mercury containing drugs or chemicals, then authorization must first be provided in accordance with the special provision in Section VI.C.6.a of this Order.
- ~~e.b.~~ Prohibition A.4 prohibited the discharge of Malachite-Green and Nitrofurazone due to previous use by the Discharger. However, due to concerns with the potential environmental and human health impacts associated with their use, the Discharger discontinued use of these drugs/chemicals in 2006. Therefore, the prohibition is no longer applicable and has not been retained in this Order. If the Discharger wishes to use Malachite-Green and Nitrofurazone, then

authorization must first be provided in accordance with the special provision in Section VI.C.6.a of this Order.

B. Technology-Based Effluent Limitations

1. Scope and Authority

Section 301(b) of the CWA and implementing USEPA permit regulations at 40 CFR 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge(s) authorized by this Order must meet minimum federal technology-based requirements based on Best Professional Judgment (BPJ) in accordance with 40 CFR 125.3.

The CWA requires that technology-based effluent limitations be established based on several levels of controls:

- a. Best practicable treatment control technology (BPT) represents the average of the best performance by plants within an industrial category or subcategory. BPT standards apply to toxic, conventional, and non-conventional pollutants.
- b. Best available technology economically achievable (BAT) represents the best existing performance of treatment technologies that are economically achievable within an industrial point source category. BAT standards apply to toxic and non-conventional pollutants.
- c. Best conventional pollutant control technology (BCT) represents the control from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, and oil and grease. The BCT standard is established after considering the "cost reasonableness" of the relationship between the cost of attaining a reduction in effluent discharge and the benefits that would result, and also the cost effectiveness of additional industrial treatment beyond BPT.

- d. New source performance standards (NSPS) represent the best available demonstrated control technology standards. The intent of NSPS guidelines is to set limitations that represent state-of-the-art treatment technology for new sources.

The CWA requires USEPA to develop effluent limitations, guidelines and standards (ELGs) representing application of BPT, BAT, BCT, and NSPS. CWA section 402(a)(1) and 40 CFR 125.3 authorize the use of BPJ to derive technology-based effluent limitations on a case-by-case basis where ELGs are not available for certain industrial categories and/or pollutants of concern. Where BPJ is used, the permit writer must consider specific factors outlined in 40 CFR 125.3.

On 23 August 2004 USEPA published ELGs for the Concentrated Aquatic Animal Production Point Source Category (40 CFR Part 451). The ELGs became effective on 22 September 2004. The ELGs establishes national technology-based effluent discharge requirements for flow-through and recirculation systems and for net pens based on BPT, BCT, BAT and 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.

In the process of developing the ELGs, USEPA identified an extensive list of pollutants of concern in discharges from the aquaculture industry, including several metals, nutrients, solids, biochemical oxygen demand (BOD), bacteria, drugs, and residuals of federally registered pesticides. USEPA did not include specific numerical limitations in the ELGs for any pollutants on this list, believing that best management practices would provide acceptable control of these pollutants. USEPA did conclude during the development of the ELGs that control of suspended solids would also effectively control concentrations of other pollutants of concern, such as BOD, metals and nutrients, because other pollutants are either bound to the solids

or are incorporated into them. And, although certain bacteria are found at high levels in effluents from settling basins, USEPA concluded that disinfection is not economically achievable. USEPA also allowed permitting authorities to apply technology-based limits for other pollutants and water quality-based numeric effluent limits for pollutants considered in the ELGs in order to comply with applicable water quality standards.

Concentrated aquatic animal production (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. The Central Valley Water Board is defining the Discharger's Facilities as an aquatic research facility and is not designating the facility as a cold-water, flow-through CAAP that would be subject to the ELGs. However, due to its similarity in operation and chemicals used, the Central Valley Water Board is using the ELGs for the basis for several discharge requirements and prohibitions contained in this Order.

2. Applicable Technology-Based Effluent Limitations

a. Biochemical Oxygen Demand. Order No. R5-2006-0126 included technology-based effluent limitations for BOD at Discharge Point Nos. 001 and 002. As described in section IV.B.1 above, EPA concluded that control of suspended solids would also effectively control concentrations of BOD. The limitations for BOD in Order No. R5-2006-0126 (10 mg/L monthly average, 15 mg/L weekly average, and 25 mg/L daily maximum) were established prior to the issuance of the ELGs and were established as a means of controlling potential contribution to eutrophication and oxygen depletion in the receiving water. Results of monitoring required by Order No. R5-2006-0126 also indicates that the Discharger has been capable of meeting these limitations. The Central Valley Water Board concurs with USEPA that control of TSS will also adequately control the discharge of BOD. Therefore, this Order will not retain the effluent limitations for BOD.

- b. Total Suspended Solids.** Order No. R5-2006-0126 included technology-based effluent limitations for TSS at Discharge Point Nos. 001 and 002. As described in section IV.B.1 above, EPA believed that it would be more appropriate to promulgate qualitative TSS limitations in the form of solids control BMP requirements, as compared to quantitative numeric effluent limitations. However, removal of the numeric limitations for TSS would constitute backsliding under CWA Section 402(o). Further, the situation for this Discharger does not meet the exceptions for less stringent limitations in reissued permits at 40 CFR 122.44(l)(2)(i). The limitations for TSS in Order No. R5-2006-0126 (25 mg/L monthly average, 40 mg/L weekly average, and 65 mg/L daily maximum) were established prior to the issuance of the ELGs and were established as a means of controlling the discharge of solids from algae, silt, fish feces and uneaten feed. Results of monitoring required by Order No. R5-2006-0126 also indicates that the Discharger is capable of meeting these limitations. Therefore, this Order retains the effluents limitations for TSS contained in Order No. R5-2006-0126.
- c. Settleable Solids.** Settleable solids are part of the solids pollutant loadings from aquaculture facilities. Order No. R5-2006-0126 contained a technology-based daily maximum limitation for settleable solids of 0.1 ml/L at Discharge Point Nos. 001 and 002. In order to ensure the Discharger maintains proper management of the Facilities and protects the receiving water, this limitation is being carried over to this Order.
- d. Flow.** Order No. R5-2006-0126 included average dry weather effluent limitations for flow at Discharge Point Nos. 001 and 002. In an effort to ensure that the settling ponds are not hydraulically overloaded, potentially impacting the performance of the ponds, these flow limitations are retained in this Order.

**Summary of Technology-based Effluent Limitations
 Discharge Point Nos. 001 and 002**

Table F-7. Summary of Technology-based Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Total Suspended Solids	mg/L	25	40	65	--	--
Settleable Solids	ml/L	--	--	0.1	--	--
Flow	mgd	--	--	1	--	--

¹ The average dry weather discharge flow shall not exceed 1.44 mgd.

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

Section 301(b) of the CWA and 40 CFR 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards.

40 CFR 122.44(d)(1)(i) mandates that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established using: (1) USEPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed state criterion or policy interpreting the state’s narrative criterion, supplemented with other relevant information, as provided in 40 CFR 122.44(d)(1)(vi).

The process for determining reasonable potential and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable water quality objectives and criteria that are contained in other state plans and policies, or any applicable water quality criteria contained in the CTR and NTR.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

The Basin Plan designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. In addition, the Basin Plan implements State Water Board Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply.

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

The federal CWA section 101(a)(2), states: *“it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water be achieved by July 1, 1983.”* Federal Regulations, developed to implement the requirements of the CWA, create a rebuttable presumption that all waters be designated as fishable and swimmable. Federal Regulations, 40 CFR sections 131.2 and 131.10, require that all waters of the State regulated to protect the beneficial uses of public water supply, protection and propagation of fish, shell fish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation. Section 131.3(e), 40 CFR, defines existing beneficial uses as those uses actually attained after 28 November 1975, whether or not they are included in the water quality standards. Federal Regulation, 40 CFR section

131.10 requires that uses be obtained by implementing effluent limitations, requires that all downstream uses be protected and states that in no case shall a state adopt waste transport or waste assimilation as a beneficial use for any waters of the United States.

a. Receiving Water and Beneficial Uses. The Facility discharges to the South Fork of Putah Creek, a tributary to the Sacramento-San Joaquin Delta.

Beneficial uses applicable to Putah Creek from Lake Berryessa to Yolo Bypass are as follows:

Table F-8. Basin Plan Beneficial Uses

Discharge Points	Receiving Water Name	Beneficial Use(s)
001 and 002	South Fork of Putah Creek	<p><u>Existing:</u> Municipal and domestic supply (MUN); Agricultural supply, including irrigation and stock watering (AGR); Water contact recreation, including canoeing and rafting (REC-1); Non-contact water recreation (REC-2); Warm freshwater habitat (WARM); Spawning, reproduction, and/or early development, warm (SPWN); Wildlife habitat (WILD)</p> <p><u>Potential:</u> Cold freshwater habitat (COLD)</p>

b. Effluent and Ambient Background Data. The reasonable potential analysis (RPA), as described in section IV.C.3 of this Fact Sheet, was based on data from January 2008 through December 2010 for Discharge Point Nos. 001 and 002, which includes effluent and ambient background data submitted in SMRs and the ROWD. As required in Special Provision VI.C.6.a, Drug and Other Chemical Use Reporting (or Provision I.5 in Order R5-2006-0126), the Discharger notifies in advance to request authorization from the Executive Officer to use other aquaculture chemicals not authorized in the Order. Therefore, in this case,

Central Valley Water Board staff believes that using the most recent three years of monitoring data is representative of the discharge conditions because the composite of the wastewater is consistent. Generally, the use of more recent monitoring data is preferred as it is more representative of current discharge conditions and because data quality assurance/quality control (QA/QC) improves with time. In addition, for priority pollutants that were not routinely monitored for during the previous permit term, quarterly monitoring data from December 2006 through September 2007 were used for the RPA. For salinity, including electrical conductivity, total dissolved solids, sulfate, and chloride), all available data from December 2006 through December 2010 were used.

- c. **Conversion Factors.** The CTR contains aquatic life criteria for arsenic, cadmium, chromium (III), chromium (VI), copper, lead, nickel, silver, and zinc which are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The default USEPA conversion factors contained in Appendix 3 of the SIP were used to convert the applicable dissolved criteria to total recoverable criteria.
- d. **Hardness-Dependent CTR Metals Criteria.** The *California Toxics Rule* and the *National Toxics Rule* contain water quality criteria for seven metals that vary as a function of hardness. The lower the hardness the lower the water quality criteria. The metals with hardness-dependent criteria include cadmium, copper, chromium (III), lead, nickel, silver, and zinc.

This Order has established the criteria for hardness-dependent metals based on the reasonable worst-case ambient hardness as required by the SIP¹, the CTR²

¹ The SIP does not address how to determine the hardness for application to the equations for the protection of aquatic life when using hardness-dependent metals criteria. It simply states, in Section 1.2, that the criteria shall be properly adjusted for hardness using the hardness of the receiving water.

² The CTR requires that, for waters with a hardness of 400 mg/L (as CaCO₃), or less, the actual ambient hardness of the surface water must be used. It further requires that the hardness values used must be consistent with the design discharge conditions for design flows and mixing zones.

and State Water Board Order No. WQO 2008-0008 (City of Davis). The SIP and the CTR require the use of “receiving water” or “actual ambient” hardness, respectively, to determine effluent limitations for these metals. (SIP, § 1.2; 40 CFR § 131.38(c)(4)) The CTR does not define whether the term “ambient,” as applied in the regulations, necessarily requires the consideration of upstream as opposed to downstream hardness conditions. Therefore, where reliable, representative data are available, the hardness value for calculating criteria can be the downstream receiving water hardness, after mixing with the effluent (Order WQO 2008-0008, p. 11). The Central Valley Water Board thus has considerable discretion in determining ambient hardness (*Id.*, p.10). Guidance on the selection of the appropriate ambient hardness was provided by the State Water Board in Order No. WQO 2008-0008 (City of Davis).

The State Water Board allows, where reliable, representative data are available, the hardness value for calculating criteria can be the downstream receiving water hardness, after mixing with the effluent. (Order WQO 2008-0008, p. 11.) Regional water boards have considerable discretion in determining ambient hardness as long as the hardness values are protective under all flow conditions. (*Id.*, pp. 10-11.)

As discussed below, scientific literature provides a reliable method for calculating protective hardness-dependent CTR criteria, considering all discharge conditions. This methodology produces hardness-dependent CTR criteria based on the reasonable worst-case downstream ambient hardness that ensure these metals do not cause receiving water toxicity under any downstream receiving water condition. Under this methodology, the Central Valley Water Board considers all hardness conditions that could occur in the ambient downstream receiving water after the effluent has mixed with the water body¹. This ensures that effluent limitations are fully protective of aquatic life in all areas of the receiving water

¹ All effluent discharges will change the ambient downstream metals concentration and hardness. It is not possible to change the metals concentration without also changing the hardness.

affected by the discharge under all flow conditions, at the fully mixed location, and throughout the water body including at the point of discharge into the water body.

i. **Conducting the Reasonable Potential Analysis (RPA).** The SIP in Section 1.3 states, "*The RWQCB shall...determine whether a discharge may: (1) cause, (2) have a reasonable potential to cause, or (3) contribute to an excursion above any applicable priority pollutant criterion or objective.*" Section 1.3 provides a step-by-step procedure for conducting the RPA. The procedure requires the comparison of the maximum effluent concentration (MEC) and maximum ambient background concentration to the applicable criterion that has been properly adjusted for hardness. Unless otherwise noted, for the hardness-dependent CTR metals criteria the following procedures were followed for properly adjusting the criterion for hardness when conducting the RPA.

(a) The SIP requires a WQBEL if the MEC exceeds the applicable criterion, adjusted for hardness. For comparing the MEC to the applicable criterion, the "fully mixed" reasonable worst-case downstream ambient hardness was used to adjust the criterion. In this evaluation the portion of the receiving water affected by the discharge is analyzed. For hardness-dependent criteria, the hardness of the effluent has an impact on the determination of the applicable criterion in areas in the receiving water affected by the discharge. Therefore, for comparing the MEC to the applicable criterion, the reasonable worst-case downstream ambient hardness was used to adjust the criterion. For this situation it is necessary to consider the hardness of the effluent in determining the applicable hardness to adjust the criterion. The procedures for determining the applicable criterion after proper adjustment using the reasonable worst-case downstream hardness is outlined in subsection ii, below.

(b) The SIP requires a WQBEL if the receiving water is impaired upstream (outside the influence) of the discharge, i.e., if the maximum ambient background concentration of a pollutant exceeds the applicable criterion, adjusted for hardness¹. For comparing the maximum ambient background concentration to the applicable criterion, the reasonable worst-case upstream ambient hardness was used to adjust the criteria. This is appropriate, because this area is outside the influence of the discharge. Since the discharge does not impact the upstream hardness, the effect of the effluent hardness was not included in this evaluation.

ii. **Calculating Water Quality-Based Effluent Limitations.** The remaining discussion in this section relates to the development of water quality-based effluent limitations (WQBELs) limits when it has been determined that the discharge has reasonable potential to cause or contribute to an exceedance of the CTR hardness-dependent metals criteria in the receiving water.

A 2006 Study² developed procedures for calculating the effluent concentration allowance (ECA)³ for CTR hardness-dependent metals. The 2006 Study demonstrated that it is necessary to evaluate all discharge conditions (e.g., high and low flow conditions) and the hardness and metals concentrations of the effluent and receiving water when determining the appropriate ECA for these hardness-dependent metals. This method is superior to relying on downstream receiving water samples alone because it captures all possible mixed conditions in the receiving water. Both receiving water and effluent hardness vary based on flow and other factors, but the variability of receiving water and effluent hardness is sometimes independent. Using a calculated hardness value ensures that the Central Valley Water Board

¹ The pollutant must also be detected in the effluent.

² Emerick, R.W.; Borroum, Y.; & Pedri, J.E., 2006. California and National Toxics Rule Implementation and Development of Protective Hardness Based Metal Effluent Limitations. WEFTEC, Chicago, Ill.

³ The ECA is defined in Appendix 1 of the SIP (page Appendix 1-2). The ECA is used to calculate water quality-based effluent limitations in accordance with Section 1.4 of the SIP.

considers all possible mixed downstream values that may result from these two independent variables. Relying on receiving water sampling alone is less likely to capture all possible mixed downstream conditions.

The equation describing the total recoverable regulatory criterion, as established in the CTR¹, is as follows:

$$\text{CTR Criterion} = \text{WER} \times (e^{m[\ln(H)]+b}) \quad (\text{Equation 1})$$

Where:

H = hardness (as CaCO₃)²

WER = water-effect ratio

m, b = metal- and criterion-specific constants

In accordance with the CTR, the default value for the WER is 1. A WER study must be conducted to use a value other than 1. The constants “m” and “b” are specific to both the metal under consideration, and the type of total recoverable criterion (i.e., acute or chronic). The metal-specific values for these constants are provided in the CTR at paragraph (b)(2), Table 1.

The equation for the ECA is defined in Section 1.4, Step 2, of the SIP and is as follows:

$$\text{ECA} = C \quad (\text{when } C \leq B^3) \quad (\text{Equation 2})$$

Where:

C = the priority pollutant criterion/objective, adjusted for hardness (see Equation 1, above)

¹ 40 CFR § 131.38(b)(2).

² For this discussion, all hardness values are in mg/L as CaCO₃.

³ The 2006 Study assumes the ambient background metals concentration is equal to the CTR criterion (i.e. $C \leq B$).

B = the ambient background concentration

The 2006 Study demonstrated that the relationship between hardness and the calculated criteria is the same for some metals, so the same procedure for calculating the ECA may be used for these metals. The same procedure can be used for chronic cadmium, chromium (III), copper, nickel, and zinc. These metals are hereinafter referred to as “Concave Down Metals”.

“Concave Down” refers to the shape of the curve represented by the relationship between hardness and the CTR criteria in Equation 1. Another similar procedure can be used for determining the ECA for acute cadmium, lead, and acute silver, which are referred to hereafter as “Concave Up Metals”.

ECA for Chronic Cadmium, Chromium (III), Copper, Nickel, and Zinc - For Concave Down Metals (i.e., chronic cadmium, chromium (III), copper, nickel, and zinc) the 2006 Study demonstrates that when the effluent is in compliance with the CTR criteria and the upstream receiving water is in compliance with the CTR criteria, any mixture of the effluent and receiving water will always be in compliance with the CTR criteria¹. The 2006 Study proves that regardless of whether the effluent hardness is lower or greater than the upstream hardness, the reasonable worst-case flow condition is the effluent dominated condition (i.e., no receiving water flow)². Consequently, for Concave Down Metals, the CTR criteria have been calculated using the downstream ambient hardness under this condition.

¹ 2006 Study, p. 5700

² There are two typographical errors in the 2006 Study in the discussion of Concave Down Metals when the effluent hardness is less than the receiving water hardness. The effluent and receiving water hardness were transposed in the discussion, but the correct hardness values were used in the calculations. The typographical errors were confirmed by the author of the 2006 Study, by email dated 1 April 2011, from Dr. Robert Emerick to Mr. James Marshall, Central Valley Water Board.

The effluent hardness ranged, at Discharge Point No. 001, from 315 mg/L to 442 mg/L, based on 24 samples from January 2008 to December 2010.

The upstream receiving water hardness varied from 133 mg/L to 269 mg/L, based on 10 samples from January 2008 to December 2010. The downstream receiving water hardness varied from 137 mg/L to 295 mg/L, based on 15 samples from December 2006 to December 2010.

The effluent hardness ranged, at Discharge Point No. 002, from 270 mg/L to 393 mg/L, based on 27 samples from January 2008 to December 2010.

The upstream receiving water hardness varied from 124 mg/L to 285 mg/L, based on 12 samples from January 2008 to December 2010. The downstream receiving water hardness varied from 120 mg/L to 298 mg/L, based on 17 samples from December 2006 to December 2010.

For Discharge Point No. 001, and under the effluent dominated condition, the reasonable worst-case downstream ambient hardness is 315 mg/L. As demonstrated in the example shown in Table F-9 below, using this hardness to calculate the ECA for all Concave Down Metals will result in WQBELs that are protective under all flow conditions, from the effluent dominated condition to high flow condition.

This example for copper assumes the following conservative conditions for the upstream receiving water:

- Upstream receiving water always at the lowest observed upstream receiving water hardness (i.e., 133 mg/L)
- Upstream receiving water copper concentration always at the CTR criteria (i.e., no assimilative capacity).

Using these reasonable worst-case receiving water conditions, a simple mass balance (as shown in Equation 3, below) accounts for all possible mixtures of effluent and receiving water under all flow conditions.

$$C_{MIX} = C_{RW} \times (1-EF) + C_{Eff} \times (EF) \quad \text{(Equation 3)}$$

Where:

C_{MIX} = Mixed concentration (e.g., metals or hardness)

C_{RW} = Upstream receiving water concentration

C_{Eff} = Effluent concentration

EF = Effluent Fraction

In this example, for copper, for any receiving water flow condition (high flow to low flow), the fully-mixed downstream ambient copper concentration is in compliance with the CTR criteria.¹

¹ This method considers the actual lowest upstream hardness and actual lowest effluent hardness to determine the reasonable worst-case ambient downstream hardness under all possible receiving water flow conditions. Table F-6 demonstrates that the receiving water is always in compliance with the CTR criteria at the fully-mixed location in the receiving water. It also demonstrates that the receiving water is in compliance with the CTR criteria for all mixtures from the point of discharge to the fully-mixed location. Therefore, a mixing zone is not used for compliance.

Table F-9. Copper ECA Evaluation (Discharge Point No. 001)

		Lowest Observed Effluent Hardness		315 mg/L (as CaCO₃)	
		Lowest Observed Upstream Receiving Water Hardness		133 mg/L (as CaCO₃)	
		Highest Assumed Upstream Receiving Water Copper Concentration		12 µg/L¹	
		Copper ECA_{chronic}²		25 µg/L	
		Fully Mixed Downstream Ambient Concentration			
Effluent Fraction⁶		Hardness³ (mg/L)	CTR Criteria⁴ (µg/L)	Copper⁵ (µg/L)	Complies with CTR Criteria
High Flow ↓ Low Flow	1%	135	12	12	Yes
	5%	142	13	13	Yes
	15%	160	14	14	Yes
	25%	179	15	15	Yes
	50%	224	19	18	Yes
	75%	270	22	22	Yes
	100%	315	25	25	Yes

- ¹ Highest assumed upstream receiving water copper concentration calculated using Equation 1 for chronic criterion at a hardness of 133 mg/L.
- ² ECA calculated using Equation 1 for chronic criterion at a hardness of 315 mg/L.
- ³ Fully mixed downstream ambient hardness is the mixture of the receiving water and effluent hardness at the applicable effluent fraction using Equation 3.
- ⁴ Fully mixed downstream ambient criteria are the chronic criteria calculated using Equation 1 at the mixed hardness.
- ⁵ Fully mixed downstream ambient copper concentration is the mixture of the receiving water and effluent copper concentrations at the applicable effluent fraction using Equation 3.
- ⁶ The effluent fraction ranges from 1% at the high receiving water flow condition, to 100% at the lowest receiving water flow condition (i.e., effluent dominated).

ECA for Acute Cadmium, Lead, and Acute Silver - For Concave Up Metals (i.e., acute cadmium, lead, and acute silver), the relationship between hardness and the metals criteria is different than for Concave Down Metals. The 2006 Study demonstrates that for Concave Up Metals, the effluent and upstream receiving water can be in compliance with the CTR criteria, but the resulting mixture may contain metals

concentrations that exceed the CTR criteria and could cause toxicity. For these metals, the 2006 Study provides a mathematical approach to calculate the ECA that is protective of aquatic life, in all areas of the receiving water affected by the discharge, under all discharge and receiving water flow (see Equation 4, below).

The ECA, as calculated using Equation 4, is based on the reasonable worst-case upstream receiving water hardness, the lowest observed effluent hardness, and assuming no receiving water assimilative capacity for metals (i.e., ambient background metals concentrations are at their respective CTR criterion). Equation 4 is not used in place of the CTR equation (Equation 1). Rather, Equation 4, which is derived using the CTR equation, is used as a direct approach for calculating the ECA. This replaces an iterative approach for calculating the ECA. The CTR equation has been used to evaluate the receiving water downstream of the discharge at all discharge and flow conditions to ensure the ECA is protective (e.g., see Table F-6).

$$ECA = \left(\frac{m(H_e - H_{rw}) \left(e^{m \{ \ln(H_{rw}) \} + b} \right)}{H_{rw}} \right) + e^{m \{ \ln(H_{rw}) \} + b} \quad \text{(Equation 4)}$$

(Equation 4)

Where:

- m, b = criterion specific constants (from CTR)
- H_e = lowest observed effluent hardness
- H_{rw} = reasonable worst-case upstream receiving water hardness

Using the procedures discussed above to calculate the ECA for all Concave Up Metals will result in WQBELs that are protective under all potential effluent/receiving water flow conditions (high flow to low flow) and under all

known hardness conditions, as demonstrated in Table F-10, for lead at Discharge Point No. 001.

Table F-10. Lead ECA Evaluation (Discharge Point No. 001)

		Lowest Observed Effluent Hardness			315 mg/L
		Reasonable Worst-case Upstream Receiving Water Hardness			133 mg/L
		Reasonable Worst-case Upstream Receiving Water Lead Concentration			4.6 µg/L¹
		Lead ECA_{chronic}²			13 µg/L
		Fully Mixed Downstream Ambient Concentration			
Effluent Fraction⁶		Hardness³ (mg/L) (as CaCO ₃)	CTR Criteria⁴ (µg/L)	Lead⁵ (µg/L)	Complies with CTR Criteria
High Flow  Low Flow	1%	135	4.7	4.7	Yes
	5%	142	5.0	5.0	Yes
	15%	160	5.8	5.8	Yes
	25%	179	6.7	6.6	Yes
	50%	224	8.9	8.6	Yes
	75%	270	11	11	Yes
100%	315	14	13	Yes	

- ¹ Reasonable worst-case upstream receiving water lead concentration calculated using Equation 1 for chronic criterion at a hardness of 133 mg/L.
- ² ECA calculated using Equation 4 for chronic criteria.
- ³ Fully mixed downstream ambient hardness is the mixture of the receiving water and effluent hardness at the applicable effluent fraction.
- ⁴ Fully mixed downstream ambient criteria are the chronic criteria calculated using Equation 1 at the mixed hardness.
- ⁵ Fully mixed downstream ambient lead concentration is the mixture of the receiving water and effluent lead concentrations at the applicable effluent fraction.
- ⁶ The effluent fraction ranges from 1% at the high receiving water flow condition, to 100% at the lowest receiving water flow condition (i.e., effluent dominated).

Based on the procedures discussed above, Table F-11 (Discharge Point No. 001) and Table F-12 (Discharge Point No. 002) list all the CTR hardness-dependent metals and the associated ECA used in this Order.

Table F-11. Summary of ECA Evaluations for CTR Hardness-dependent Metals at Discharge Point No. 001

CTR Metals	ECA (µg/L, total recoverable)	
	Acute	Chronic
Copper	41	25
Chromium (III)	4,444	530
Cadmium	16	6.1
Lead	322	13
Nickel	1,239	138
Silver	22	--
Zinc	317	317

Table F-12. Summary of ECA Evaluations for CTR Hardness-dependent Metals at Discharge Point No. 002

CTR Metals	ECA (µg/L, total recoverable)	
	Acute	Chronic
Copper	36	22
Chromium (III)	3917	467
Cadmium	13	5.4
Lead	268	10
Nickel	1087	121
Silver	18	--
Zinc	278	278

3. Determining the Need for WQBELs

- a. The Central Valley Water Board conducted the RPA in accordance with section 1.3 of the SIP. Although the SIP applies directly to the control of CTR priority pollutants, the State Water Board has held that the Central Valley Water Board may use the SIP as guidance for water quality-based toxics control.¹ The SIP states in the introduction “*The goal of this Policy is to establish a standardized*

¹ See Order WQO 2001-16 (Napa) and Order WQO 2004-0013 (Yuba City).

approach for permitting discharges of toxic pollutants to non-ocean surface waters in a manner that promotes statewide consistency.” Therefore, in this Order the RPA procedures from the SIP were used to evaluate reasonable potential for both CTR and non-CTR constituents based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs.

b. Constituents with No Reasonable Potential. WQBELs are not included in this Order for constituents that do not demonstrate reasonable potential.

i. Aluminum

(a) WQO. Absent numeric aquatic criteria for aluminum, WQBELs are based on the narrative toxicity objective. The Basin Plan’s *Policy for Application of Water Quality Objectives* requires the Central Valley Water Board to consider, “*on a case-by case basis, direct evidence of beneficial use impacts, all material and relevant information submitted by the discharger and other interested parties, and relevant numerical criteria and guidelines developed and/or published by other agencies and organizations. In considering such criteria, the Board evaluates whether the specific numerical criteria which are available through these sources and through other information supplied to the Board, are relevant and appropriate to the situation at hand and, therefore, should be used in determining compliance with the narrative objective.*” Relevant information includes, but is not limited to, USEPA recommended criteria. (Basin Plan, p. IV.-17.00; see also, 40 CFR 122.44(d)(vi).)

The Central Valley Water Board considered all available material and relevant information submitted by the Discharger, and relevant numerical criteria and guidelines developed and/or published by other agencies and organizations, the USEPA National Recommended Ambient Water Quality Criteria (NAWQC) and supporting studies, National Recommended Water Quality Criteria-Correction, ~~the Arid West Water Quality Research Project~~

~~and supporting studies,~~ and site-specific aluminum studies conducted by other dischargers within the Central Valley Region in evaluating the appropriate criteria for protection of the beneficial uses to comply with the narrative toxicity objective.

USEPA developed the NAWQC for protection of freshwater aquatic life for aluminum. The recommended 4-day average (chronic) and 1-hour average (acute) criteria for aluminum are 87 µg/L and 750 µg/L, respectively, for waters with a pH of 6.5 to 9.0. In April 1999, USEPA released the National Recommended Water Quality Criteria-Correction. There were no corrections to the 1988 aluminum recommended criteria; however, USEPA recognized that they were aware of field data indicating that many high quality waters of the U.S. contain more than 87 µg/L aluminum, when either total recoverable or dissolved is measured (i.e., the higher levels of aluminum did not affect beneficial uses). Footnote L of Table 2 on page 19 of the National Recommended Ambient Water Quality Criteria Correction (April 1999), indicates that the chronic aquatic life criterion is based on studies conducted under specific receiving water conditions with a low pH (6.5 to 6.6 pH units) and low hardness (<120 mg/L as CaCO₃) and suggests the use of a water effects ratio (WER) may be appropriate.

The NAWQC chronic aquatic life criterion is based on studies conducted under conditions with low pH (6.5 - 6.6) and low hardness (<120 mg/L as CaCO₃) to determine the effects on striped bass and brook trout. During the 7-day long test with aluminum concentration averaged at 87 µg/L, no mortality occurred to 160 day old striped bass. This study, conducted with pH variations of 7.2 to 6.5 to 6.0 s.u., indicate that pH variation also had a large effect on aluminum toxicity.

As shown in the table below, monitoring data indicates that the pH and hardness of the effluent from Discharge Point No. 002 and receiving water are not similar to the low pH (6.5 - 6.6) and low hardness (<12 mg/L as CaCO₃) conditions under which the chronic criterion for aluminum was developed. Although the Discharger has not conducted a site-specific WER study, it appears as if the NAWQC chronic criterion of 87 µg/L should not be used as the basis for establishing effluent limits for Discharge Point No. 002.

Parameter	Units	Test Conditions for Applicability of Chronic Criterion	Discharge Point No. 002 Effluent	Receiving Water
pH	standard units	6.5 - 6.6	7.9 - 8.4	7.9 - 8.4
Hardness, Total (as CaCO ₃)	mg/L	<120	159 - 393	124 - 293

~~Without the inclusion of the two low pH and hardness studies referred to by EPA indicating 87 µg/L as the recommended chronic criterion, EPA indicated that 748 µg/L is the applicable chronic criterion following the *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses* (1985). Due to uncertainties with the NAWQC for aluminum, USEPA Region IX funded the Arid West Water Quality Research Project ("Arid West Project), which was established in 1995, under an Assistance Agreement between USEPA and Pima County Wastewater Management District. The Agreement allowed for research and recommendations of appropriate water quality criteria, standards and uses for effluent-dependent and ephemeral waters in the arid and semi-arid regions of the West, and to improve the scientific basis for regulating wastewater and storm water discharges in the arid and semi-arid West.~~

~~In May 2006, The Arid West Project produced its fifth in a series of research reports, *Evaluation of the EPA Recalculation Procedure in the Arid West Technical Report* ("Technical Report"). This Technical Report was to "*to evaluate use of the [USEPA's] Recalculation Procedure on selected water quality criteria with different modes of toxicity in specific arid and semi-arid West waters. In addition, a User's Guide for Development of Site-Specific Water Quality Standards in Arid West Effluent-dependent Streams Using USEPA's Recalculation Procedure was also prepared as a practical guide for water quality standards practitioners regarding use of the Recalculation Procedure for developing site specific water quality standards.*"~~

~~The Arid West Technical Report recalculated the NAWQC criterion based on more recent data and to reflect the resident species and water quality observed in the ephemeral, effluent dominant arid West surface waters. Although not directly applicable in this situation because the South Fork of Putah Creek is neither ephemeral nor effluent-dominated, use of the recalculation procedure included in the Arid West Technical Report can provide an indication of the expected relative toxicity of aluminum in a similar geographic setting. Using the lowest receiving water hardness in the South Fork of Putah Creek of 124 mg/L, the recalculated chronic criterion total aluminum criteria would be 1,090 µg/L.~~

Other dischargers in the Delta (e.g., City of Manteca, City of Modesto) have performed WER studies that indicate that a WER greater than 1.0 may be appropriate for aluminum. Therefore, Central Valley Water Board does not consider the NAWQC chronic criterion to be applicable to this discharge situation.

The Secondary Maximum Contaminant Level - Consumer Acceptance Limit for aluminum is 200 µg/L for the protection of MUN beneficial use, and it is applied as an annual average.

(b) RPA Results. The MEC for aluminum at Discharge Point No. 001 is <50 µg/L (all samples were reported as <50 µg/L); the MEC for aluminum at Discharge Point No. 002 is 89 µg/L, based on four samples (note that the other three samples were reported as <50 µg/L). The reported upstream receiving water concentration for aluminum ranged from <50 µg/L to 320 µg/L. The ROWD states that aluminum is believed absent from the discharge from both discharge points. It is known that the South Fork of Putah Creek supports juvenile and adult salmon and spawning, and most likely supports rainbow trout as well.

Based on the information above and the sampling result for aluminum, the discharge does not exceed the recalculated chronic criterion of ~~1,090,748 µg/L at a minimum hardness of 124 mg/L~~. In addition, based on the single sampling result the discharge does not have reasonable potential to exceed the Secondary MCL of 200 µg/L or the acute criterion of 750 µg/L.

This Order does not establish an effluent limitation for aluminum.

ii. Cadmium

(a) WQO. The CTR includes hardness dependent criteria for the protection of freshwater aquatic life for cadmium. Using the default conversion factors and reasonable worst-case measured hardness, as described in section VI.C.2.d of this Fact Sheet, for Discharge Point No. 001 the applicable acute (1-hour average) criterion is 6.2 µg/L and the applicable chronic (4-day average) criterion is 3.1 µg/L., as total recoverable. For Discharge Point No. 002 the applicable acute (1-hour average) criterion is

5.8 µg/L and the applicable chronic (4-day average) criterion is 2.9 µg/L., as total recoverable.

(b) RPA Results. All values for cadmium at Discharge Point Nos. 001 and 002, as well as all upstream receiving water concentrations were reported as below the analytical detection level of 0.25 µg/L (as total recoverable). Order No. R5-2006-0126 included effluent limitations for cadmium because of its potential use by the Discharger in future research activities. Based on existing discharge data from the Facilities, cadmium concentrations in the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for the protection of freshwater aquatic life. Therefore, this Order will not retain the effluent limitations for cadmium. Removal of these effluent limitations is in accordance with federal antibacksliding regulations (see section IV.D.3 of this Fact Sheet).

The Discharger listed cadmium in the ROWD as a possible experimental agent that may be used during the term of this Order. If cadmium is to be used as an experimental agent, the Discharger must provide information related to its use as required in the special provision in Section VI.C.6.a of this Order. Further, the Discharger is required in Section VI.C.3.a of this Order to implement best management practices to minimize the potential for release of pollutants and ensure all drugs and chemicals are used in accordance with applicable regulations for their use in aquatic production facilities.

iii. Chromium (Total)

(a) WQO. DPH has adopted a Primary MCL for total chromium of 50 µg/L, which is protective of the Basin Plan's chemical constituent objective.

(b) RPA Results. The MEC for total chromium was 25 µg/L at Discharge Point No. 001, and 21 µg/L at Discharge Point No. 002. The maximum

observed upstream receiving water concentration was 7.8 µg/L above Discharge Point No. 001, and 7.6 µg/L above Discharge Point No. 002. Therefore, total chromium in the discharges from the Facilities does not have a reasonable potential to cause or contribute to an in-stream excursion above the primary MCL. The existing effluent limitation for total chromium will not be carried over to this Order. Removal of these effluent limitations is in accordance with federal antibacksliding regulations (see section IV.D.3 of this Fact Sheet).

iv. Mercury

- (a) **WQO.** The current NAWQC for protection of freshwater aquatic life, continuous concentration, for mercury is 0.77 µg/L (30-day average, chronic criteria). The CTR contains a human health criterion (based on a threshold dose level causing neurological effects in infants) of 0.050 µg/L for waters from which both water and aquatic organisms are consumed. Both values are controversial and subject to change. In 40 CFR Part 131, USEPA acknowledges that the human health criteria may not be protective of some aquatic or endangered species and that “...more stringent mercury limits may be determined and implemented through use of the State’s narrative criterion.” In the CTR, USEPA reserved the mercury criteria for freshwater and aquatic life and may adopt new criteria at a later date.
- (b) **RPA Results.** The MEC for mercury was 0.0032 µg/L at Discharge Point No. 001, and 0.0016 µg/L at Discharge Point No. 002. The maximum observed upstream receiving water concentration was 0.0029 µg/L above Discharge Point No. 001 and 0.0031 µg/L above Discharge Point No. 002. The reported concentrations for mercury do not exceed the CTR human health criteria. Therefore, mercury in the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion above the CTR human health criterion, and the effluent

limitations for mercury have not been retained in this Order. Removal of these effluent limitations is in accordance with federal antibacksliding regulations (see section IV.D.3 of the Fact Sheet).

v. Selenium

(a) WQO. The CTR includes maximum 1-hour average and 4-day average criteria of 20 µg/L and 5 µg/L, respectively, for total recoverable selenium for the protection of freshwater aquatic life.

(b) RPA Results. The MEC for selenium was 3.6 µg/L at Discharge Point No. 001, and <2 µg/L at Discharge Point No. 002. The maximum observed upstream receiving water concentration was <2 µg/L. Therefore, selenium in the discharges from the Facilities do not have a reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for the protection of freshwater aquatic life. Therefore, this Order will not retain the effluent limitations for selenium. Removal of these effluent limitations is in accordance with federal antibacksliding regulations (see section IV.D.3 of this Fact Sheet).

The Discharger listed selenium in the ROWD as a possible experimental agent that may be used during the term of this Order. If selenium is to be used as an experimental agent, the Discharger must provide information related to its use as required in the special provision in Section VI.C.6.a of this Order. Further, the Discharger is required in Section VI.C.3.a of this Order to implement best management practices to minimize the potential for release of pollutants and ensure all drugs and chemicals are used in accordance with applicable regulations for their use in aquatic production facilities.

c. Constituents with Limited Data. Not Applicable

d. Constituents with Reasonable Potential. The Central Valley Water Board finds that the discharge has a reasonable potential to cause or contribute to an in-

stream excursion above a water quality standard for the following constituents at both Discharge Point Nos. 001 and 002: chlorine residual, chromium (VI), formaldehyde, iron, and pH. WQBELs for these constituents are included in this Order. Summaries of the RPA for each Discharge Point are provided in Attachment G, and a detailed discussion of the RPA for each constituent is provided below.

i. Chromium (VI)

- (a) WQO.** The CTR includes maximum 1-hour average and 4-day average criteria of 16 µg/L and 11 µg/L, respectively, for chromium (VI) for the protection of freshwater aquatic life.
- (b) RPA Results.** The MEC for chromium (VI) was 33 µg/L while the maximum observed upstream receiving water concentration was 9.4 µg/L at Discharge Point No. 001. The MEC was 22 µg/L while the maximum observed upstream receiving water concentration was 9.3 µg/L at Discharge Point No. 002. Therefore, chromium (VI) in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for the protection of freshwater aquatic life at both discharge locations.
- (c) WQBELs.** Due to no assimilative capacity, dilution credits are not allowed for development of the WQBELs for chromium (VI). This Order contains a final AMEL and MDEL for chromium VI of 11 µg/L and 15 µg/L at Discharge Point No. 001, and of 10 µg/L and 16 µg/L at Discharge Point No. 002. These limitations are based on the CTR criterion for the protection of freshwater aquatic life.
- (d) Plant Performance and Attainability.** Analysis of the effluent data shows that the MECs of 33 µg/L at Discharge Point No. 001 and of 22 µg/L at Discharge Point No. 002 are greater than applicable WQBELs. Based on the sample results for the effluent, the limitations appear to put the

Discharger in immediate non-compliance. New or modified control measures may be necessary in order to comply with the effluent limitations, and the new or modified control measures cannot be designed, installed and put into operation within 30 calendar days. Furthermore, the effluent limitations for chromium (VI) are a new regulatory requirement within this permit, which becomes applicable to the waste discharge with the adoption of this Order, which was adopted after 1 July 2000. Therefore, a compliance time schedule for compliance with the chromium (VI) effluent limitations is established in TSO R5-2012-XXXX in accordance with Water Code section 13300, that requires preparation and implementation of a pollution prevention plan in compliance with Water Code section 13263.3.

ii. Iron

- (a) WQO.** The Secondary MCL - Consumer Acceptance Limit for iron is 300 µg/L, which is used to implement the Basin Plan's chemical constituent objective for the protection of municipal and domestic supply.
- (b) RPA Results.** The maximum observed annual average effluent concentration for iron at Discharge Point No. 001 was 36 µg/L, while the maximum observed annual average upstream receiving water concentration was 351 µg/L. The maximum observed annual average effluent concentration for iron at Discharge Point No. 002 was 117 µg/L, while the maximum observed annual average upstream receiving water concentration was 330 µg/L. Therefore, iron in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Secondary MCL.
- (c) WQBELs.** This Order contains an annual average effluent limitation for iron of 300 µg/L based on the Basin Plan's narrative chemical constituents objective and the Secondary MCL. Secondary MCLs are drinking water standards contained in Title 22 of the California Code of

Regulations. For Secondary MCLs, Title 22 requires compliance with these standards on an annual average basis, when sampling at least quarterly. Since water that meets these requirements on an annual average basis is suitable for drinking, it is impracticable to calculate average weekly and average monthly effluent limitations because such limits would be more stringent than necessary to protect the MUN beneficial use. Central Valley Water Board has determined that an averaging period similar to what is used by the DPH for those parameters regulated by Secondary MCLs is appropriate, and that using shorter averaging periods is impracticable because it sets more stringent limits than necessary.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the maximum annual average effluent concentration of iron in Discharge Point Nos. 001 and 002 are less than the applicable WQBEL. The Central Valley Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible.

iii. pH

(a) WQO. The Basin Plan includes a water quality objective for surface waters (except for Goose Lake) that the "...pH shall not be depressed below 6.5 nor raised above 8.5."

(b) RPA Results. The discharge of wastewater from the concentrated aquatic animal production facilities have a reasonable potential to cause or contribute to an excursion above the Basin Plan's numeric objectives for pH.

(c) WQBELs. Effluent limitations for pH of 6.5 as an instantaneous minimum and 8.5 as an instantaneous maximum are included in this Order based on protection of the Basin Plan objectives for pH.

(d) Plant Performance and Attainability. For Discharge Point No. 001, pH during the previous permit term ranged from 7.9 to 9.0; only one value

(9.0 reported in October 2009) out of the 154 reported exceeded the pH effluent limitations. For Discharge Point No. 002, pH during the previous permit term ranged from 7.9 to 8.4. The Central Valley Water Board concludes, therefore, that immediate compliance with these effluent limitations is feasible.

iv. Salinity

- (a) **WQO.** ~~There are no USEPA water quality criteria for the protection of aquatic organisms for electrical conductivity, total dissolved solids, sulfate, and chloride. The Basin Plan contains a chemical constituent objective that incorporates state MCLs, contains a narrative objective, and contains numeric water quality objectives for electrical conductivity, total dissolved solids, sulfate, and chloride.~~The Basin Plan contains a chemical constituent objective that incorporates state MCLs, contains a narrative objective, and contains numeric water quality objectives for certain specified water bodies for electrical conductivity, total dissolved solids, sulfate, and chloride. The USEPA Ambient Water Quality Criteria for Chloride recommends acute and chronic criteria for the protection of aquatic life. There are no USEPA water quality criteria for the protection of aquatic life for electrical conductivity, total dissolved solids, and sulfate. Additionally, there is no USEPA numeric water quality criteria for the protection of agriculture, industrial, and live stock usage. Numeric values for the protection of these uses are typically done based on site specific conditions and evaluations to determine the appropriate constituent threshold necessary to interpret the narrative chemical constituent Basin Plan objective.

Table F-13. Salinity Water Quality Criteria/Objectives

Parameter	Agricultural WQ Objective Goal ¹	Secondary MCL ³	USEPA NAWQC	Effluent (Discharge Point No. 001)		Effluent (Discharge Point No. 002)	
				Average	Max	Average	Max
EC (µmhos/cm)	Varies ²	900, 1600, 2200	N/A	597	765	553	823
TDS (mg/L)	Varies	500, 1000, 1500	N/A	564	1,082	433	1,378
Sulfate (mg/L)	Varies	250, 500, 600	N/A	30	30	28	35
Chloride (mg/L)	Varies	250, 500, 600	860 (1-hr) 230 (4-day)	87	409	31	288

¹ Narrative chemical constituent objective of the Basin Plan. Procedures for establishing the applicable numeric limitation to implement the narrative objective can be found in the Policy for Application of Water Quality, Chapter IV, Section 8 of the Basin Plan. However, the Basin Plan does not require improvement over naturally occurring background concentrations. In cases where the natural background concentration of a particular constituent exceeds an applicable water quality objective, the natural background concentration will be considered to comply with the objective. ~~Agricultural water quality goals based on *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)~~

² ~~The EC level in irrigation water that harms crop production depends on the crop type, soil type, irrigation methods, rainfall, and other factors. An EC level of 700 µmhos/cm is generally considered to present no risk of salinity impacts to crops. However, many crops are grown successfully with higher salinities. See also related discussion below for the results of a site-specific EC study performed by the Discharger that indicates higher salinities are protective of sensitive crops.~~

³ The secondary MCLs are stated as a recommended level, upper level, and a short-term maximum level.

(1) Chloride. The secondary MCL for chloride is 250 mg/L, as a recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum. The Central Valley Water Board must determine the applicable numeric limit to implement the narrative objective for the

protection of agricultural supply. The most limiting ~~The recommended~~
agricultural water quality goal ~~for chloride, that would apply to interpret~~
the narrative chemical constituent objective, is 106 mg/L as a long-
term average based on 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).
The 106 mg/L water quality goal is intended to protect against
adverse effects on sensitive crops when irrigated via sprinklers.
However, the agricultural water quality goal is not a site-specific goal
or objective, but rather a general measure to protect salt-sensitive
crops. Site specific levels of chloride for the receiving waters are
necessary to interpret the narrative chemical constituents objective for
protection of agricultural supply. USEPA Ambient Water Quality
Criteria for Chloride recommends acute (1-hour) and chronic (4-day)
criteria for the protection of freshwater aquatic life of 860 mg/L and
230 mg/L, respectively.

The Central Valley Water Board is currently implementing the CV-
SALTS initiative to develop a Basin Plan Amendment that will
establish a salt and nitrate Management Plan for the Central Valley.
Through this effort the Basin Plan will be amended to define how the
narrative water quality objective is to be interpreted for the protection
of agricultural use. All studies conducted through this Order to
establish an agricultural limit to implement the narrative objective will
be reviewed by and consistent with the efforts currently underway by
CV-SALTS.

- (2) **Electrical Conductivity.** The secondary MCL for EC is 900 $\mu\text{mhos/cm}$ as a recommended level, 1600 $\mu\text{mhos/cm}$ as an upper level, and 2200 $\mu\text{mhos/cm}$ as a short-term maximum. The Central Valley Water Board must determine the applicable numeric limit to implement the

narrative objective for the protection of agricultural supply, The most limiting agricultural water quality goal ~~The agricultural water quality goal, that would apply the narrative chemical constituents objective, is may be as low as 700 μ mhos/cm as a long-term average based on 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). However, t~~ The 700 μ mhos/cm agricultural water quality goal is not a site-specific goal or objective, but rather a general measure of electrical conductivity that was determined to protect intended to prevent reduction in crop yield, i.e. a restriction on use of water, for salt-sensitive crops, such as beans, carrots, turnips, and strawberries under certain soil and climate conditions. These crops are either currently grown in the area or may be grown in the future. Most other crops can tolerate higher EC concentrations without harm. Site specific levels of EC for the receiving waters to interpret the narrative chemical constituents objective in the Basin Plan for protection of agricultural supply are necessary. Overall, ~~however, as the salinity of the agricultural irrigation water increases, more crops are potentially harmed by the EC, or must be maintained at levels in which growers do not need to take extra measures must be taken by the farmer to minimize or eliminate any harmful impacts.~~

In July 2004, the Discharger performed a site-specific study to determine the potential impacts of salinity on downstream agricultural uses of Putah Creek. In particular, the Discharger updated the approach used by Ayers and Westcot to allow for consideration of local rainfall. The study focused on the potential impacts to yield of dry beans, considered to be the most salt-sensitive crop in the Davis area. Based on this study, it was concluded that irrigation water with an EC of 1100 μ mhos/cm would not measurably impact dry bean yield.

The Central Valley Water Board is currently implementing the CV-SALTS initiative to develop a Basin Plan Amendment that will establish a salt and nitrate Management Plan for the Central Valley. Through this effort the Basin Plan will be amended to define how the narrative water quality objective is to be interpreted for the protection of agricultural use. All studies conducted through this Order to establish an agricultural limit to implement the narrative objective will be reviewed by and consistent with the efforts currently underway by CV-SALTS.

- (3) **Sulfate.** The secondary MCL for sulfate is 250 mg/L as a recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum.
- (4) **Total Dissolved Solids.** The secondary MCL for TDS is 500 mg/L as a recommended level, 1000 mg/L as an upper level, and 1500 mg/L as a short-term maximum. The Central Valley Water Board must determine the applicable numeric limit to implement the narrative objective for the protection of agricultural supply, The most limiting agricultural water quality goal ~~The recommended agricultural water quality goal for TDS, that would apply the narrative chemical constituent objective, is~~ may be as low as 450 mg/L as a long-term average based on 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). Water Quality for Agriculture evaluates the impacts of salinity levels on crop tolerance and yield reduction, and establishes water quality goals that are protective of the agricultural uses. However, t~~The 450 mg/L water quality goal is not a site-specific goal, but rather a general measure of TDS that was determined to protect intended to prevent reduction in crop yield, i.e. a restriction on use of water, for salt-sensitive crops. Only the most salt sensitive crops require irrigation water of~~

450 mg/L or less to prevent loss of yield. Most other crops can tolerate higher TDS concentrations without harm, ~~however, as the salinity of the irrigation water increases, more crops are potentially harmed by the TDS, or extra measures must be taken by the farmer to minimize or eliminate any harmful impacts.~~ Site specific levels of TDS for the receiving waters to interpret the narrative chemical constituents objective are necessary.

The Central Valley Water Board is currently implementing the CV-SALTS initiative to develop a Basin Plan Amendment that will establish a salt and nitrate Management Plan for the Central Valley. Through this effort the Basin Plan will be amended to define how the narrative water quality objective is to be interpreted for the protection of agricultural use. All studies conducted through this Order to establish an agricultural limit to implement the narrative objective will be reviewed by and consistent with the efforts currently underway by CV-SALTS.

(b) RPA Results.

(1) Chloride. Chloride concentrations in the Discharge Point No. 001 effluent ranged from 6 mg/L to 409 mg/L, with an average of 87 mg/L. These levels exceed the agricultural water goal. No background concentrations data was reported for the South Fork of Putah Creek.

Chloride concentrations in the Discharge Point No. 002 effluent ranged from 6 mg/L to 288 mg/L, with an average of 31 mg/L. These levels exceed the agricultural water goal. No background concentrations data was reported for the South Fork of Putah Creek.

(2) Electrical Conductivity. A review of the Discharger's monitoring reports for Discharge Point No. 001 shows an average effluent EC of

597 $\mu\text{mhos/cm}$, with a range from 333 $\mu\text{mhos/cm}$ to 765 $\mu\text{mhos/cm}$. These levels exceed the agricultural water goal. The background receiving water EC averaged 441 $\mu\text{mhos/cm}$.

A review of the Discharger's monitoring reports for Discharge Point No. 002 shows an average effluent EC of 553 $\mu\text{mhos/cm}$, with a range from 84 $\mu\text{mhos/cm}$ to 823 $\mu\text{mhos/cm}$. These levels exceed the agricultural water goal, but not the levels established as protective based on the July 2004 study by the Discharger. The background receiving water EC averaged 454 $\mu\text{mhos/cm}$.

(3) Sulfate. Sulfate concentrations in the Discharge Point No. 001 effluent ranged from 29 mg/L to 30 mg/L, with an average of 30 mg/L. These levels do not exceed the secondary MCL. No background concentrations data was reported for the South Fork of Putah Creek.

Sulfate concentrations in the Discharge Point No. 002 effluent ranged from 13 mg/L to 35 mg/L, with an average of 28 mg/L. These levels do not exceed the secondary MCL. No background concentrations data was reported for the South Fork of Putah Creek.

(4) Total Dissolved Solids. The average TDS effluent concentration reported for Discharge Point No. 001 was 564 mg/L with concentrations ranging from 363 mg/L to 1,082 mg/L. These levels exceed the applicable water quality objectives. No background concentrations data was reported for the South Fork of Putah Creek.

The average TDS effluent concentration reported for Discharge Point No. 002 was 433 mg/L with concentrations ranging from 223 mg/L to 1,378 mg/L. These levels exceed the applicable water quality objectives. No background concentrations data was reported for the South Fork of Putah Creek

(c) **WQBELs.** Effluent limitations based on the MCL or the Basin Plan would likely require construction and operation of a reverse osmosis treatment plant. The State Water Board, in Water Quality Order 2005-005 (for the City of Manteca), states, “...*the State Board takes official notice [pursuant to Title 23 of California Code of Regulations, Section 648.2] of the fact that operation of a large-scale reverse osmosis treatment plant would result in production of highly saline brine for which an acceptable method of disposal would have to be developed. Consequently, any decision that would require use of reverse osmosis to treat the City’s municipal wastewater effluent on a large scale should involve thorough consideration of the expected environmental effects.*” The State Water Board states in that Order, “*Although the ultimate solution to southern Delta salinity problems have not yet been determined, previous actions establish that the State Board intended for permit limitations to play a limited role with respect to achieving compliance with the EC water quality objectives in the southern Delta.*” The State Water Board goes on to say, “*Construction and operation of reverse osmosis facilities to treat discharges...prior to implementation of other measures to reduce the salt load in the southern Delta, would not be a reasonable approach.*”

The Central Valley Water Board, with cooperation of the State Water Board, has begun the process to develop a new policy for the regulation of salinity in the Central Valley. In a statement issued at the 16 March 2006, Central Valley Water Board meeting, Board Member Dr. Karl Longley recommended that the Central Valley Water Board continue to exercise its authority to regulate discharges of salt to minimize salinity increases within the Central Valley. Dr. Longley stated, “*The process of developing new salinity control policies does not, therefore, mean that we should stop regulating salt discharges until a salinity Policy is developed. In the meantime, the Board should consider all possible interim*

approaches to continue controlling and regulating salts in a reasonable manner, and encourage all stakeholder groups that may be affected by the Regional Board's policy to actively participate in policy development."

Information submitted by the Discharger indicates that water for the Facilities is supplied by pumped groundwater and Lake Berryessa surface water. According to the Discharger, groundwater EC levels are approximately 750 umhos/cm. Lake Berryessa supply water EC levels range from 240 umhos/cm to 475 umhos/cm. Receiving water monitoring information submitted by the Discharger indicates that the EC level in Putah Creek upstream of the two discharge locations range from 235 umhos/cm to 635 umhos/cm.

Performance-based EC effluent limitations have been included in this Order to protect the beneficial uses of the receiving water. To be consistent with the Central Valley Water Board's current strategy of not allowing an increase of salinity discharges into surface waters that drain into the Delta, an annual average effluent limitation of 744 μ mhos/cm for Discharge Point No. 001 (Aquatic Center) and 748 μ mhos/cm for Discharge Point No. 002 (Putah Creek Facility) have been established. These EC effluent limitations represent the highest annual average EC for the period 2006 through 2010, and prevent the Discharger from increasing its current salinity loading to the receiving water.

In order to ensure that the Discharger will continue to control the discharge of salinity, this Order includes a requirement to update and continue to implement a salinity evaluation and minimization plan.

- (d) Plant Performance and Attainability.** Data submitted by the Discharger demonstrates that the Discharger shall be able to comply with the performance-based EC limitations and consideration of a compliance schedule for EC is not necessary.

- v. **Aquaculture Drugs and Chemicals.** Promulgated 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 (as specified in the ROWD). Therefore, the Central Valley Water Board used the narrative water quality objective for toxicity from the Basin Plan and applied the Policy for “Application of Water Quality Objectives” as a basis for determining “reasonable potential” for discharges of these drugs and chemicals. The toxicity 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 Plans state that compliance with the toxicity objective will be determined by several factors, including biotoxicity tests of appropriate duration, or other analytical methods as specified by the Central Valley Water 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 analyses are 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 Central Valley Region, CAAP facility effluents generally contain only one or two known chemicals at any given a time. Therefore, the Central Valley Water 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 completed biotoxicity studies to determine the aquatic toxicity of certain aquaculture drugs and chemicals commonly used at their CAAP facilities in the Central Valley Region; specifically, formalin, hydrogen peroxide, potassium permanganate, MS-222, Chloramine-T, and PVP iodine. The DFG Pesticide Unit conducted chronic toxicity tests for some drugs and chemicals using *Pimephales promelas*, *Ceriodaphnia dubia*, and, in some cases, *Selenastrum capricornutum* in accordance with the analytical methods specified in the USEPA *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms* (EPA 600/4-91-002). 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 LC₅₀ concentration (lethal concentration to 50% of the exposed organisms over the test period) is sometimes reported when lethality is measured. Since many chemical treatments are utilized as a “flush” or “batch” treatment, the DFG Pesticide Unit also conducted acute toxicity tests using *Ceriodaphnia dubia* (*C. dubia*) in accordance with methods specified in the USEPA *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms* (EPA 600/4-90/027). Acute toxicity test results typically are reported as the No Observed Adverse Effect Level (NOAEL), the Lowest Observed Adverse Effect Level (LOAEL), and LC₅₀.

(a) Oxytetracycline. 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. CAAP facilities use the antibiotic during disease outbreaks. Oxytetracycline is most commonly used at CAAP facilities as a feed additive. However, oxytetracycline may also be used as an extra-label use under a veterinarian’s prescription in an immersion bath of approximately 6 to 8 hours in duration. Because oxytetracycline may be applied in an immersion bath for up to 8 hours

at a time, the Central Valley Water Board considered the results of acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit when determining whether water quality-based effluent limits for oxytetracycline used in an immersion bath treatment were necessary. 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 regarding use and discharge of oxytetracycline at the Facilities indicates that it is discharged at levels well below the lowest NOEC and NOAEL (estimated concentrations reported by the Discharger ranged from 0.37 mg/L to 15 mg/L). Further, oxytetracycline is only used periodically as needed for disease treatment (according to the drugs and chemicals reporting during the previous permit term, oxytetracycline was only used twice each with a duration of less than 7 days). Therefore, the Central Valley Water Board has 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 Plan. Accordingly, this Order does not include an effluent limitation for oxytetracycline. However, monthly use of oxytetracycline must be reported as specified in Section IX.A of the Monitoring and Reporting Program (Attachment E).

- (b) Amoxicillin, erythromycin, florfenicol, and Romet-30®.** Amoxicillin, erythromycin, florfenicol, and Romet-30® may be used by the Facilities. Amoxicillin is injected into fish to control acute disease outbreaks through a veterinarian's prescription for extra-label use. Erythromycin (injected or used in feed formulations) and florfenicol (used in feed formulations) are antibiotics used to control acute disease outbreaks. Erythromycin must be used under an INAD exemption or a veterinarian feed directive. Florfenicol is a NADA approved drug. Romet 30®, also known by the

trade name Sulfadimethoxine-oremtroprim, is an antibiotic used in feed formulations and is FDA-approved for use in aquaculture for control of furunculosis in salmonids. Amoxicillin (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 the Discharger implements BMPs as required by this Order. Accordingly, this Order does not include WQBELs for these substances; however, this Order does require monthly monitoring and reporting of these substances as specified in the attached Monitoring and Reporting Program.

(c) **MS-222®.** CAAP facilities use the anesthetic Tricaine methanesulfonate, commonly known as MS-222 (with trade names of Finquel® or Tricaine-S®). MS-222 has been approved by FDA for use as an anesthetic for *Salmonidae*. Results of toxicity tests using *C. dubia* where the test animals were exposed to MS-222 for 2 hours, followed by three exchanges of control water to remove residual compound and then observed for 96 hours, determined the NOEC and LOEC to be 70 and 200 mg/L respectively. MS-222 is used as a 50 or 150 gallon static treatment bath having 350 mg/L MS-222. The concentration is diluted well below 70 mg/L when discharged at CAAP facilities. Based on available information regarding MS-222 when used according to the reported treatment, MS-222 is not discharged at levels that cause, have the reasonable potential to cause, or will contribute to an excursion of Basin Plan narrative water quality objectives for toxicity. Accordingly, this Order does not include WQBELs for MS-222. However, use and monitoring of MS-222 must be reported as specified in the attached Monitoring and Reporting Program.

(d) **PVP Iodine.** PVP Iodine (Argentyne), a solution composed of 10% PVP Iodine Complex and 90% inert ingredients. PVP Iodine typically is

applied in short-term treatments of 1 hour or less to disinfect eggs spawned at CAAP facilities. Because PVP Iodine typically is applied in short-term treatments of 1-hour or less, results of acute aquatic life toxicity testing conducted by the DFG Pesticide Unit were considered when determining whether water quality-based effluent limitations for PVP Iodine were necessary in this Order. Results of a single acute toxicity test with *C. dubia* showed a 96-hour NOAEL of 0.86 mg/L. PVP Iodine used to disinfect eggs. Based on available information PVP Iodine is not discharged at levels that cause, have the reasonable potential to cause, or will contribute to an excursion of Basin Plan narrative water quality objectives for toxicity. Accordingly, this Order does not include WQBELS for PVP Iodine. However, use and monitoring of PVP Iodine must be reported as specified in Section IX.A of the Monitoring and Reporting Program (Attachment E).

(e) Formaldehyde (Formalin). Formalin, a solution typically 37 percent by weight formaldehyde, (also known by the trade names Formalin-F®, Paracide-F®, PARASITE-S®) is FDA-approved for use in CAAP facilities for controlling external protozoa and monogenetic trematodes on fish, and for controlling fungi of the family *Saprolegniaceae* in food-producing aquatic species. Formalin is used as a treatment for controlling external parasites in raceways where it would be discharged to surface waters. Formalin treatments are usually utilized as a batch or flush treatment which result in discharges from 3 to 8 hours.

The State of California Department of Health Services (DHS) does not have an MCL for formaldehyde, however the DHS Notification Level is listed as 0.1 mg/L based on calculation by standard risk assessment methods, with a Modifying Factor equal to 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 the protection of aquatic life.

The DFG Pesticide Unit conducted biotoxicity studies to determine the aquatic toxicity of Formalin using *Pimephales promelas* and *C. dubia*. A summary of the data submitted follows:

Species	7-day LC50 (mg/L)	LOEC (mg/L)	NOEC (mg/L)	LOAEL (mg/L)	NOAEL (mg/L)
<i>Ceriodaphnia dubia</i>	2.43	5.8 ¹ 1.3 ²	1.3 ¹ <1.3 ²	5.8	1.3
<i>Pimephales promelas</i>	23.3	9.09	2.28	--	--
<i>Selanastrum capricornutum</i>	<5.2	--	--	--	--

¹ Survival

² Reproduction

Notes: DFG lab report no. P-2251.1 dated 6/30/2001. Results as formaldehyde. Divide by 0.37 to obtain the equivalent Formalin concentration.

Since Formalin treatments are usually utilized as a batch or flush treatment which result in discharges from 3 to 8 hours, short-term tests were conducted with *C. dubia*, exposing the organisms for 2-hour and 8-hour periods, removing them from the chemical, and continuing the observation period for 7 days in clean water. The results were as follows:

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

Notes: DFG lab report no. P-2294.1 dated 1/30/2002. Results as formaldehyde. Divide by 0.37 to obtain the equivalent Formalin concentration.

Results of both acute and chronic aquatic life toxicity testing conducted by the DFG Pesticide Unit, effluent limitations from other previous

individual CAAP Orders, and the Basin Plan narrative toxicity objective were considered when determining whether WQBELs for formalin as formaldehyde were necessary. Results of 7-day 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 (the Central Valley Water Board used an NOEC of 1.3 mg/L). Acute toxicity tests conducted using *C. dubia* showed a 96-hour NOAEL of 1.3 mg/L formaldehyde. The additional acute toxicity tests with *C. dubia* conduct using only an 8-hour exposure, resulted in a 96-hour NOAEL concentration of 6.7 mg/L formaldehyde.

The Central Valley Water Board has determined that if formalin is used at CAAP facilities, formaldehyde may be discharged at levels that cause, have the reasonable potential to cause, or contribute to an excursion of the Basin Plan narrative water quality objective. Accordingly, this Order includes WQBELs for formaldehyde. Although formaldehyde treatments at CAAP facilities are short in duration exposure to formaldehyde in the receiving water as a result of discharges from CAAP facilities may be long-term because of retention time in the settling basin and potential application procedures (e.g., successive raceway treatments, drip treatments for eggs). Therefore, an average monthly formaldehyde effluent limitation of 0.6 mg/L and a maximum daily formaldehyde 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 WQBELs. These limitations are carried over from the previous Order. These effluent limitations will ensure protection of aquatic life against effects from exposure to formaldehyde in CAAP facility discharges, as well as be protective of human health (as compared to the DHS Notification level for formaldehyde). Use and monitoring of formaldehyde must also be reported as specified in the attached Monitoring and Reporting Program.

The Central Valley Water 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 the effluent.

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

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

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

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

Long Term Average concentration based on acute ECA

$$LTA_a = 1.3 \text{ mg/L} \times 0.321 = 0.4173 \text{ mg/L formaldehyde}$$

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

Long Term Average concentration based on chronic ECA

$$LTA_c = 1.3 \text{ mg/L} \times 0.527 = 0.6851 \text{ mg/L formaldehyde}$$

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

Most Limiting LTA concentration

LTA = 0.4173 mg/L formaldehyde

Average Monthly Effluent Limit

AMEL = LTA x 1.55

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

AMEL = 0.4173 mg/L X 1.55 = 0.6 mg/L formaldehyde

Maximum Daily Effluent Limit

MDEL = LTA x 3.11

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

MDEL = 0.4173 mg/L X 3.11 = 1.3 mg/L formaldehyde

- (f) ***Hydrogen Peroxide.*** Hydrogen peroxide (35% H₂O₂) has been used for the control of external parasites at CAAP facilities. FDA approved hydrogen peroxide to control fungi on fish at all life stages, including eggs. Hydrogen peroxide may also be used to control bacterial gill disease in salmonids, and, through an INAD, external parasites. Hydrogen peroxide is a strong oxidizer that rapidly breaks down into water and oxygen; however, it exhibits toxicity to aquatic life during the oxidation process. The Central Valley Water 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 Order. Results of an acute toxicity test

using *C. dubia* showed a 96 hour NOAEL of 1.3 mg/L based on continual constant exposure to hydrogen peroxide. When exposed to hydrogen peroxide for 2 hours followed by a triple lab water flush and normal test completion, *C. dubia* showed a 96-hour NOEC of 2 mg/L. Based on the chemical nature of hydrogen peroxide (i.e., high reactivity resulting in rapid degradation) and on available information regarding hydrogen peroxide when used according to the reported treatments, hydrogen peroxide is not discharged at levels that cause, have the reasonable potential to cause, or will contribute to an excursion of Basin Plan narrative water quality objectives for toxicity. Accordingly, this Order does not include WQBELs for hydrogen peroxide. However, use and monitoring of hydrogen peroxide must be reported as specified in the attached Monitoring and Reporting Program.

(g) *Potassium Permanganate.* Potassium permanganate (also known by the trade name of Cairox™) may be used to control gill disease, external parasites, bacteria, and fungal growth on fish. Potassium permanganate has a low estimated lifetime in the environment, being readily converted by oxidizable materials to insoluble manganese dioxide (MnO₂). In non-reducing and non-acidic environments, MnO₂ is insoluble and has a very low bioaccumulative potential. Potassium permanganate is a special category drug the FDA calls “regulatory action deferred”. 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 0.038 mg/L for potassium permanganate under continuous exposure. The DFG’s 2-hour exposure test showed a 0.1975 mg/L NOEC. Since potassium permanganate is rapidly converted to insoluble manganese dioxide under hatchery conditions, this Order does not include WQBELs for potassium permanganate. However, use and monitoring of potassium permanganate must be reported as specified in the attached Monitoring and Reporting Program.

- (h) ***Sodium Chloride.*** Sodium chloride (salt) is used at CAAP facilities to control external parasites on fish and as an osmoregulatory aid to relieve stress on the confined fish populations. 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 of salt is used, good management practices are followed, and local environmental requirements are met. The Salinity section in this Fact Sheet (IV.C.3.d.iv.) includes information on salt usage and reasonable potential.
- (i) ***Chloramine-T.*** Chloramine-T is available for use in accordance with an INAD exemption by FDA as a possible replacement for copper sulfate and formalin. The therapeutic treatment consists of a 10 to 20 mg/L dose for a 1-hour exposure once per day for a 1 to 3 day period. Chloramine-T breaks down into para-toluenesulfonamide (p TSA) and unlike other chlorine-based disinfectants does not form harmful chlorinated compounds. Results of the DFG Pesticide Unit *C. dubia* test where the test animals were exposed to the toxicant for 2 hours followed by three exchanges of control water to remove residual compound and then observed for 96 hours determined the NOEC and LOEC to be 86.3 and 187 mg/L, respectively. Based on available information regarding Chloramine-T when used according to the reported treatment, Chloramine-T is not discharged at levels that cause, have the reasonable potential to cause, or will contribute to an excursion of Basin Plan narrative water quality objectives for toxicity. Accordingly, this Order does not include WQBELs for Chloramine-T. However, use and monitoring of Chloramine-T must be reported as specified in the attached Monitoring and Reporting Program.
- (j) ***Chlorine.*** Bleach or sodium hypochlorite is used at the Facilities as a disinfectant to control algae growth, to kill bacteria in tanks, as well as to sanitize facility equipment. There are no numeric water quality

objectives for chlorine in the NTR, CTR, or Basin Plans. Based on this information, the Central Valley Water Board determined that chlorine is currently, or may potentially be discharged from CAAP facilities in the Basin 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 acute 1-hour average (19 µg/L) and chronic 4-day average (11 µg/L) criteria for chlorine. Accordingly, this Order establishes a WQBEL for total residual chlorine. Because bleach/ sodium hypochlorite are typically applied in a single, short-term "flush" treatment, the Central Valley Water Board has determined that an AMEL is not necessary, and a MDEL of 18 µg/L could be used for controlling total residual chlorine discharges from the Facilities. The MDEL is carried over from Order No. R5-2006-0126. This effluent limitation will ensure protection of aquatic life against effects from exposure to chlorine in discharges from the Facilities. Use and monitoring of chlorine must be reported as specified in the attached Monitoring and Reporting Program.

The Central Valley Water Board used the procedures in USEPA's TSD guidance 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.

ECA based on acute criterion with no dilution allowance

$$ECA_a = 19 \mu\text{g/L}$$

ECA based on chronic criterion with no dilution allowance

$$ECA_c = 11 \mu\text{g/L}$$

Long Term Average (LTA) concentration based on acute ECA

$$LTA_a = 19 \mu\text{g/L} \times 0.321 = 6.099 \mu\text{g/L}$$

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

LTA concentration based on chronic ECA

$$LTA_c = 11 \mu\text{g/L} \times 0.527 = 5.797 \mu\text{g/L}$$

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

Most Limiting LTA concentration

$$LTA = 5.797 \mu\text{g/L}$$

Maximum Daily Effluent Limit (MDEL)

$$MDEL = LTA \times 3.11$$

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

$$MDEL = 5.797 \mu\text{g/L} \times 3.11 = \mathbf{18 \mu\text{g/L} (0.018 \text{ mg/L})}$$

4. WQBEL Calculations

- a. This Order includes WQBELs at Discharge Point Nos. 001 and 002 for total residual chlorine, chromium (VI), formaldehyde, iron, pH, and electrical conductivity. The general methodology for calculating WQBELs based on the different criteria/objectives is described in subsections IV.C.4.b through e, below. See Attachment H for the WQBEL calculations.
- b. **Effluent Concentration Allowance.** For each water quality criterion/objective, the ECA is calculated using the following steady-state mass balance equation from Section 1.4 of the SIP:

$$ECA = C + D(C - B) \quad \text{where } C > B, \text{ and}$$

$$ECA = C \quad \text{where } C \leq B$$

where:

ECA = effluent concentration allowance

D = dilution credit

C = the priority pollutant criterion/objective

B = the ambient background concentration.

According to the SIP, the ambient background concentration (B) in the equation above shall be the observed maximum with the exception that an ECA calculated from a priority pollutant criterion/objective that is intended to protect human health from carcinogenic effects shall use the arithmetic mean concentration of the ambient background samples. For ECAs based on MCLs, which implement the Basin Plan's chemical constituents objective and are applied as annual averages, an arithmetic mean is also used for B due to the long-term basis of the criteria.

- c. **Basin Plan Objectives and MCLs.** For WQBELs based on site-specific numeric Basin Plan objectives or MCLs, the effluent limitations are applied directly as the

ECA as either an MDEL, AMEL, or average annual effluent limitations, depending on the averaging period of the objective.

- d. **Aquatic Toxicity Criteria.** WQBELs based on acute and chronic aquatic toxicity criteria are calculated in accordance with Section 1.4 of the SIP. The ECAs are converted to equivalent long-term averages (i.e., LTA_{acute} and $LTA_{chronic}$) using statistical multipliers and the lowest LTA is used to calculate the AMEL and MDEL using additional statistical multipliers.
- e. **Human Health Criteria.** WQBELs based on human health criteria, are also calculated in accordance with Section 1.4 of the SIP. The ECAs are set equal to the AMEL and a statistical multiplier was used to calculate the MDEL.

$$AMEL = mult_{AMEL} \left[\min \left(\overbrace{M_A ECA_{acute}}^{LTA_{acute}}, M_C ECA_{chronic} \right) \right]$$

$$MDEL = mult_{MDEL} \left[\min \left(M_A ECA_{acute}, \underbrace{M_C ECA_{chronic}}_{LTA_{chronic}} \right) \right]$$

$$MDEL_{HH} = \left(\frac{mult_{MDEL}}{mult_{AMEL}} \right) AMEL_{HH}$$

where:

$mult_{AMEL}$ = statistical multiplier converting minimum LTA to AMEL

$mult_{MDEL}$ = statistical multiplier converting minimum LTA to MDEL

M_A = statistical multiplier converting acute ECA to LTA_{acute}

M_C = statistical multiplier converting chronic ECA to $LTA_{chronic}$

Summary of Water Quality-Based Effluent Limitations

Table F-14. Water Quality-Based Effluent Limitations - Discharge Point No. 001

Parameter	Units	Effluent Limitations
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		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Total Residual Chlorine	µg/L	--	--	18	--	--
Chromium (VI)	µg/L	11	--	15	--	--
Electrical Conductivity	µmhos/cm	744 ¹	--	--	--	--
Formaldehyde	mg/L	0.6	--	1.3	--	--
Iron	µg/L	300 ¹	--	--	--	--
pH	standard units	--	--	--	6.5	8.5

¹ Annual average concentration.

Table F-15. Water Quality-Based Effluent Limitations - Discharge Point No. 002

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Total Residual Chlorine	µg/L	--	--	18	--	--
Chromium (VI)	µg/L	10	--	16	--	--
Electrical Conductivity	µmhos/cm	748 ¹	--	--	--	--
Formaldehyde	mg/L	0.6	--	1.3	--	--
Iron	µg/L	300 ¹	--	--	--	--
pH	standard units	--	--	--	6.5	8.5

¹ Annual average concentration.

5. Whole Effluent Toxicity (WET)

For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct whole effluent toxicity testing for acute and chronic toxicity, as specified in the Monitoring and Reporting Program (Attachment E section V.). This Order also contains effluent limitations for acute toxicity and requires the Discharger to implement best management practices to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity.

- a. Acute Aquatic Toxicity.** The Basin Plan contains a narrative toxicity objective that states, "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at page III-8.00) The Basin Plan also states that, "...effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate...". USEPA Region 9 provided guidance for the development of acute toxicity effluent limitations in the absence of numeric water quality objectives for toxicity in its document titled "Guidance for NPDES Permit Issuance", dated February 1994. In section B.2. "Toxicity Requirements" (pgs. 14-15) it states that, "*In the absence of specific numeric water quality objectives for acute and chronic toxicity, the narrative criterion 'no toxics in toxic amounts' applies. Achievement of the narrative criterion, as applied herein, means that ambient waters shall not demonstrate for acute toxicity: 1) less than 90% survival, 50% of the time, based on the monthly median, or 2) less than 70% survival, 10% of the time, based on any monthly median. For chronic toxicity, ambient waters shall not demonstrate a test result of greater than 1 TUc.*"

Based on annual acute toxicity testing performed by the Discharger from July 2007 through July 2010 results show 100 percent survival in all tests. To ensure compliance with the Basin plan requirements, effluent limitations for acute toxicity have been included in this Order as follows:

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

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

b. Chronic Aquatic Toxicity. The Basin Plan contains a narrative toxicity objective that states, “*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*” (Basin Plan at page III-8.00.) Based on chronic WET testing performed by the Discharger from July 2007 through July 2010, the discharge does not have reasonable potential to cause or contribute to an in-stream excursion above of the Basin Plan’s narrative toxicity objective. As shown in the tables below.

Table F-16. Whole Effluent Chronic Toxicity Testing Results: Discharge Point No. 001

Date	Fathead Minnow <i>Pimephales promelas</i>		Water Flea <i>Ceriodaphnia dubia</i>		Green Algae <i>Selenastrum capricornutum</i>
	Survival (TUc)	Growth (TUc)	Survival (TUc)	Reproduction (TUc)	Growth (TUc)
July 2007	1	1	1	1	1
July 2008	1	1	1	1	1
July 2009	1	--	1	--	1
July 2010	1	1	1	1	1

Table F-17. Whole Effluent Chronic Toxicity Testing Results: Discharge Point No. 002

Date	Fathead Minnow <i>Pimephales promelas</i>		Water Flea <i>Ceriodaphnia dubia</i>		Green Algae <i>Selenastrum capricornutum</i>
	Survival (TUc)	Growth (TUc)	Survival (TUc)	Reproduction (TUc)	Growth (TUc)
July 2007	1	1	1	1	1
July 2008	1	1	1	1	1
July 2009	1	--	1	--	1
July 2010	1	1	1	1	1

The Monitoring and Reporting Program of this Order requires annual chronic WET monitoring for demonstration of compliance with the narrative toxicity objective. In addition to WET monitoring, the Special Provision in section VI.C.2.a. of the Order requires the Discharger to submit to the Central Valley Water Board an Initial Investigative TRE Workplan for approval by the Executive Officer, to ensure the Discharger has a plan to immediately move forward with the initial tiers of a TRE, in the event effluent toxicity is encountered in the future. The provision also includes a numeric toxicity monitoring trigger, requirements for accelerated monitoring, and requirements for TRE initiation if toxicity is demonstrated.

Numeric chronic WET effluent limitations have not been included in this Order. The SIP contains implementation gaps regarding the appropriate form and implementation of chronic toxicity limits. This has resulted in the petitioning of a NPDES permit in the Los Angeles Region¹ that contained numeric chronic toxicity effluent limitations. To address the petition, the State Water Board adopted WQO 2003-012 directing its staff to revise the toxicity control provisions in the SIP. The State Water Board states the following in WQO 2003-012, *"In reviewing this petition and receiving comments from numerous interested persons on the propriety of including numeric effluent limitations for chronic toxicity in NPDES permits for publicly-owned treatment works that discharge to inland waters, we have determined that this issue should be considered in a regulatory setting, in order to allow for full public discussion and deliberation. We intend to modify the SIP to specifically address the issue. We anticipate that review*

¹ In the Matter of the Review of Own Motion of Waste Discharge Requirements Order Nos. R4-2002-0121 [NPDES No. CA0054011] and R4-2002-0123 [NPDES NO. CA0055119] and Time Schedule Order Nos. R4-2002-0122 and R4-2002-0124 for Los Coyotes and Long Beach Wastewater Reclamation Plants Issued by the California Regional Water Quality Control Board, Los Angeles Region SWRCB/OCC FILES A-1496 AND 1496(a)

will occur within the next year. We therefore decline to make a determination here regarding the propriety of the final numeric effluent limitations for chronic toxicity contained in these permits.” The process to revise the SIP is currently underway. Proposed changes include clarifying the appropriate form of effluent toxicity limits in NPDES permits and general expansion and standardization of toxicity control implementation related to the NPDES permitting process. Since the toxicity control provisions in the SIP are under revision it is infeasible to develop numeric effluent limitations for chronic toxicity. Therefore, this Order requires that the Discharger meet best management practices for compliance with the Basin Plan’s narrative toxicity objective, as allowed under 40 CFR 122.44(k).

To ensure compliance with the Basin Plan’s narrative toxicity objective, the Discharger is required to conduct chronic WET testing, as specified in the Monitoring and Reporting Program (Attachment E section V.). Furthermore, the Special Provision contained at VI.C.2.a. of this Order requires the Discharger to investigate the causes of, and identify and implement corrective actions to reduce or eliminate effluent toxicity. If the discharge demonstrates toxicity exceeding the numeric toxicity monitoring trigger, the Discharger is required to initiate a Toxicity Reduction Evaluation (TRE) in accordance with an approved TRE workplan. The numeric toxicity monitoring trigger is not an effluent limitation; it is the toxicity threshold at which the Discharger is required to perform accelerated chronic toxicity monitoring, as well as, the threshold to initiate a TRE if effluent toxicity has been demonstrated.

D. Final Effluent Limitations

1. Mass-based Effluent Limitations

40 CFR 122.45(f)(1) requires effluent limitations be expressed in terms of mass, with some exceptions, and 40 CFR 122.45(f)(2) allows pollutants that are limited in terms of mass to additionally be limited in terms of other units of measurement. This Order includes effluent limitations expressed in terms of mass and concentration. In addition, pursuant to the exceptions to mass limitations provided

in 40 CFR 122.45(f)(1), some effluent limitations are not expressed in terms of mass, such as pH and temperature, and when the applicable standards are expressed in terms of concentration (e.g., CTR criteria and MCLs) and mass limitations are not necessary to protect the beneficial uses of the receiving water.

Mass-based effluent limitations were calculated by multiplying the concentration limitation by the Facility's reasonable measure of actual flow and the appropriate unit conversion factor. Based on flow monitoring data submitted by the Discharger from December 2006 through December 2010 the long-term average flow is 0.53 mgd at Discharge Point No. 001 and 0.41 mgd at Discharge Point No. 002. Consistent with 40 CFR 122.45(b)(2)(i), the reasonable measure of actual flow for the Facility is 0.53 mgd at Discharge Point No. 001 and 0.41 mgd at Discharge Point No. 002. Unless otherwise noted, all mass limitations or mass emission rates (MERs) in this Order were calculated using the reasonable measure of actual flow.

Mass-based effluent limitations have been established at Discharge Point Nos. 001 and 002 in this Order for TSS, because it is considered an oxygen-demanding substance.

Except for the pollutants listed above, mass-based effluent limitations are not included in this Order for pollutant parameters for which effluent limitations are based on water quality objectives and criteria that are concentration-based.

2. Averaging Periods for Effluent Limitations

40 CFR 122.45(d) requires maximum daily and average monthly discharge limitations for all dischargers other than publicly owned treatment works unless impracticable. The rationale for using alternative averaging periods for total residual chlorine is discussed in section IV.C.3 of this Fact Sheet.

For effluent limitations based on Primary and Secondary MCLs, except nitrate and nitrite, this Order includes annual average effluent limitations. The Primary and Secondary MCLs are drinking water standards contained in Title 22 of the California Code of Regulations. Title 22 requires compliance with these standards on an

annual average basis (except for nitrate and nitrite), when sampling at least quarterly. Since it is necessary to determine compliance on an annual average basis, it is impracticable to calculate average weekly and average monthly effluent limitations.

3. Satisfaction of Anti-Backsliding Requirements

The Clean Water Act specifies that a revised permit may not include effluent limitations that are less stringent than the previous permit unless a less stringent limitation is justified based on exceptions to the anti-backsliding provisions contained in Clean Water Act sections 402(o) or 303(d)(4), or, where applicable, 40 CFR 122.44(l).

The effluent limitations in this Order are at least as stringent as the effluent limitations in the existing Order, with the exception of effluent limitations for BOD, total residual chlorine, cadmium, chromium (total), mercury, and selenium at both Discharge Point Nos. 001 and 002.

Order No. R5-2006-0126 included effluent limitations for BOD that are not being retained in this Order. As described in section IV.B.1, USEPA did conclude during the development of the ELGs for CAAP facilities that control of suspended solids would also effectively control concentrations of other pollutants of concern, such as BOD. Further, based on new information collected during the term of the existing Order, the Discharger has consistently shown BOD effluent concentrations at both Discharge Point Nos. 001 and 002 to be well below existing effluent limitations and at extremely low levels that do not pose a threat to receiving water quality.

For total residual chlorine, Order No. R5-2006-0126 included a MDEL based on protection of aquatic life for acute effects; and a 4-day average effluent limitation to protect aquatic life from chronic effects. As discussed in section IV.C.3 of this Fact Sheet, bleach or sodium hypochlorite are used periodically and typically applied in a single, short-term “flush” treatment. Therefore, the Central Valley Water Board

has determined that only protection for acute effects is applicable to the discharge from the Facilities. Therefore 4-day average or AMEL is not necessary.

As described further in Section IV.C.3.b of this Fact Sheet, the effluent limitations for cadmium, chromium (total), mercury, and selenium in Order No. R5-2006-0126 have not been retained in this Order. This relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations. In particular, new data and information collected during the previous permit term indicates that a reasonable potential to exceed applicable water quality objectives does not exist. Removal of these effluent limitations is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Any impact on existing water quality will be insignificant.

4. Satisfaction of Antidegradation Policy

This Order does not allow for an increase in flow or mass of pollutants to the receiving water. Therefore, a complete antidegradation analysis is not necessary. The Order requires compliance with applicable federal technology-based standards and with WQBELs where the discharge could have the reasonable potential to cause or contribute to an exceedance of water quality standards. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

a. Surface Water. The permitted surface water discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

b. Groundwater. The Discharger utilizes settling and evaporation/percolation ponds. Wastewater produced at the Facilities contains constituents such as TDS, specific

conductivity, oxygen demanding substances, and aquaculture drugs and chemicals. Percolation from the ponds may result in an increase in the concentration of these constituents in groundwater. The increase in the concentration of these constituents in groundwater must be consistent with Resolution No. 68-16. Any increase in pollutant concentrations in groundwater must be shown to be necessary to allow wastewater utility service necessary to accommodate housing and economic expansion in the area and must be consistent with maximum benefit to the people of the State of California. Some degradation of groundwater by the Discharger is consistent with Resolution No. 68-16 provided that:

- i. the degradation is limited in extent;
- ii. the degradation after effective source control, treatment, and control is limited to waste constituents typically encountered in municipal wastewater as specified in the groundwater limitations in this Order;
- iii. the Discharger minimizes the degradation by fully implementing, regularly maintaining, and optimally operating best practicable treatment and control (BPTC) measures; and
- iv. the degradation does not result in water quality less than that prescribed in the Basin Plan.

Groundwater monitoring results indicate that EC and TDS concentrations downgradient of the Facilities exceed groundwater water quality objectives, but do not conclusively show that degradation in groundwater quality is attributable to percolation from the Discharger's ponds (see related discussion in Section III.E.2 of this Fact Sheet). This Order retains the existing narrative groundwater limitations, and the requirements for groundwater monitoring for EC and TDS.

5. Stringency of Requirements for Individual Pollutants

This Order contains both technology-based effluent limitations and WQBELs for individual pollutants. The technology-based effluent limitations consist of restrictions on TSS, and settleable solids at both Discharge Point Nos. 001 and 002. The WQBELs consist of restrictions on total residual chlorine, chromium (VI), formaldehyde, iron, and pH at both Discharge Point Nos. 001 and 002. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements.

WQBELs have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that toxic pollutant WQBELs were derived from the CTR, the CTR is the applicable standard pursuant to 40 CFR 131.38. The scientific procedures for calculating the individual WQBELs for priority pollutants are based on the CTR-SIP, which was approved by USEPA on 18 May 2000. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to 30 May 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to 30 May 2000, but not approved by USEPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to 40 CFR 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the requirements of the CWA.

This Order contains pollutant restrictions that are more stringent than applicable federal requirements and standards. All effluent limitations in this Order are no more stringent than required by applicable federal standards.

Summary of Final Effluent Limitations

Table F-18. Summary of Final Effluent Limitations - Discharge Point No. 001

Parameter	Units	Effluent Limitations	Basis ¹
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		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
Total Suspended Solids	mg/L	25	40	65	--	--	BPJ
	lbs/day	110	176	286	--	--	
Chlorine, Total Residual	µg/L	--	--	18	--	--	NAWQC
Chromium (VI)	µg/L	11	--	15	--	--	CTR
Electrical Conductivity	µmhos/cm	744 ²	--	--	--	--	BP
Formaldehyde	mg/L	0.60	--	1.3	--	--	BP
Iron	µg/L	300 ²	--	--	--	--	SEC MCL
Settleable Solids	µg/L	--	--	0.1	--	--	BPJ
pH	µg/L	--	--	--	6.5	8.5	BP
Acute Toxicity	% Survival	--	--	3	--	--	BP

- ¹ BP - Based on water quality objectives contained in the Basin Plan.
 CTR - Based on water quality criteria contained in the California Toxics Rule and applied as specified in the SIP.
 NAWQC - Based on USEPA's National Ambient Water Quality Criteria for the protection of freshwater aquatic life.
 SEC MCL - Based on the Secondary Maximum Contaminant Level.
 BPJ - Best Professional Judgment.
- ² Annual average concentration.
- ³ Survival of aquatic organisms is 96-hour bioassays of undiluted waste shall be no less than:
 Minimum for any one bioassay-----70%
 Median for any three consecutive bioassays----90%

Table F-19. Summary of Final Effluent Limitations - Discharge Point No. 002

Parameter	Units	Effluent Limitations					Basis ¹
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
Total Suspended	mg/L	25	40	65	--	--	BPJ

Parameter	Units	Effluent Limitations					Basis ¹
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
Solids	lbs/day	86	138	224	--	--	
Chlorine, Total Residual	µg/L	--	--	18	--	--	NAWQC
Chromium (VI)	µg/L	10	--	16	--	--	CTR
Electrical Conductivity	µmhos/cm	748 ²	--	--	--	--	BP
Formaldehyde	mg/L	0.60	--	1.3	--	--	BP
Iron	µg/L	300 ²	--	--	--	--	SEC MCL
Settleable Solids	µg/L	--	--	0.1	--	--	BPJ
pH	µg/L	--	--	--	6.5	8.5	BP
Acute Toxicity	% Survival	--	--	3	--	--	BP

¹ BP - Based on water quality objectives contained in the Basin Plan.

CTR - Based on water quality criteria contained in the California Toxics Rule and applied as specified in the SIP.

NAWQC - Based on USEPA's National Ambient Water Quality Criteria for the protection of freshwater aquatic life.

SEC MCL - Based on the Secondary Maximum Contaminant Level.

BPJ - Best Professional Judgment.

² Annual average concentration.

³ Survival of aquatic organisms is 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassay-----70%

Median for any three consecutive bioassays-----90%

E. Interim Effluent Limitations - Not Applicable

F. Land Discharge Specifications

1. The land discharge specifications are necessary to protect the beneficial uses of the groundwater. The Discharger utilizes an evaporation/percolation pond for the

disposal of wastewater from the Aquatic Disease Lab located at the Aquatic Center. Wastewater from all other laboratories in the Aquatic Center and from the Putah Creek Facility is circulated through settling ponds (Jamison Pond and Beaver Pond/Curve Pond) prior to discharge to the South Fork of Putah Creek. This Order requires the Discharger to comply with several requirements to ensure proper operation and maintenance of the ponds. The specifications for operation of Jamison Pond, Beaver Pond and Curve Pond, as well as the Aquatic Center evaporation/percolation pond, are retained from Order No. R5-2006-0126. These specifications include, for example, implementing mosquito and vector control measures. Also nuisance conditions from ponds are typically found when strong odors occur when the dissolved oxygen concentration is allowed to drop below 1.0 mg/L. This Order requires that the dissolved oxygen concentration be maintained above 1.0 mg/L in the upper 1-foot of water in the ponds and that a minimum pond freeboard of 1 foot be maintained to prevent overtopping.

2. ~~Until recently, e~~Effluent from the Putah Creek Facility ~~could~~can be diverted to a series of ponds used for wetlands and ecosystems studies and effluent from the Aquatic Center can be routed to the proposed wetland channels before being discharged into Jamison Pond. ~~However, there is no longer a discharge of wastewater into these research wetlands. Therefore, the Order does not retain the operational specifications and limitations contained in Section H of Order No. R5-2006-0126.~~ The specifications for operation of the Putah Creek Facility wetlands are retained from Order R5-2006-0126 and the Aquatic Center wetland channels are included in this Order. These specifications include, for example, implementing mosquito and vector control measures. Also, nuisance conditions from ponds are typically found when strong odors occur when the dissolved oxygen concentration is allowed to drop below 1.0 mg/L. This Order requires that the dissolved oxygen concentration be maintained above 1.0 mg/L in the upper 1-foot of water in the ponds and that a minimum pond freeboard of 1 foot be maintained to prevent overtopping.

G. Reclamation Specifications - Not Applicable

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

Basin Plan water quality objectives to protect the beneficial uses of surface water and groundwater include numeric objectives and narrative objectives, including objectives for chemical constituents, toxicity, and tastes and odors. The toxicity objective requires that surface water and groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective requires that surface water and groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use or that exceed the maximum contaminant levels (MCLs) in Title 22, CCR. The tastes and odors objective states that surface water and groundwater shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances in concentrations that adversely affect domestic drinking water supply, agricultural supply, or any other beneficial use.

A. Surface Water

1. CWA section 303(a-c), requires states to adopt water quality standards, including criteria where they are necessary to protect beneficial uses. The Central Valley Water Board adopted water quality criteria as water quality objectives in the Basin Plan. The Basin Plan states that *"[t]he numerical and narrative water quality objectives define the least stringent standards that the Regional Water Board will apply to regional waters in order to protect the beneficial uses."* The Basin Plan includes numeric and narrative water quality objectives for various beneficial uses and water bodies. This Order contains receiving surface water limitations based on the Basin Plan numerical and narrative water quality objectives for ammonia, bacteria, biostimulatory substances, color, chemical constituents, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, suspended sediment,

settleable substances, suspended material, tastes and odors, temperature, toxicity, and turbidity.

B. Groundwater

1. The beneficial uses of the underlying ground water are municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply.
2. Basin Plan water quality objectives include narrative objectives for chemical constituents, tastes and odors, and toxicity of groundwater. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective states groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use. The tastes and odors objective prohibits taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plan also establishes numerical water quality objectives for chemical constituents and radioactivity in groundwaters designated as municipal supply. These include, at a minimum, compliance with MCLs in Title 22 of the CCR. The bacteria objective prohibits coliform organisms at or above 2.2 MPN/100 mL. The Basin Plan requires the application of the most stringent objective necessary to ensure that waters do not contain chemical constituents, toxic substances, radionuclides, taste- or odor-producing substances, or bacteria in concentrations that adversely affect municipal or domestic supply, agricultural supply, industrial supply or some other beneficial use.
3. As discussed in Section III.E.2 of this Fact Sheet, groundwater monitoring results do not indicate a degradation in groundwater quality down gradient from the ponds (including the evaporation/percolation pond) when compared to up gradient background. Order No. R5-2006-0126 included narrative groundwater limitations that stated that the discharge shall not cause the underlying groundwater to be degraded. These groundwater limitations will be retained to protect the beneficial uses of the groundwater underlying the ponds.

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

40 CFR 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorizes the Central Valley Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (Attachment E) of this Order, establishes monitoring and reporting requirements to implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the Monitoring and Reporting Program for the Facility.

A. Influent Monitoring - Not Applicable

B. Effluent Monitoring

1. Pursuant to the requirements of 40 CFR 122.44(i)(2) effluent monitoring is required for all constituents with effluent limitations. Effluent monitoring is necessary to assess compliance with effluent limitations, assess the effectiveness of the treatment process, and to assess the impacts of the discharge on the receiving stream and groundwater.
2. Effluent monitoring frequencies and sample types at Monitoring Location EFF-001 (for Discharge Point No. 001) and Monitoring Location EFF-002 (for Discharge Point No. 002) for TSS (1/quarter), total residual chlorine (1/day during use), electrical conductivity (1/quarter), formaldehyde (1/week during use), settleable solids (1/quarter), pH (1/week), flow (continuous), and acute toxicity (1/year) have been retained from Order No. R5-2006-0126 to determine compliance with effluent limitations for these parameters. The existing monitoring frequency for chromium (VI) (1/quarter or 1/week during use) has been changed to 1/month to monitor for compliance with the newly established effluent limitations.

In addition, monitoring for iron (1/quarter) is required to determine compliance with effluent limitations.

Due to the fact that all wastewater flows are directed through settling ponds where they are mixed and homogenized prior to discharge through Discharge Point Nos. 001 and 002, the 24-hour flow-proportioned sample type for TSS and settable solids has been changed to a grab sample.

3. Effluent monitoring frequencies and sample types at EFF-001 (for Discharge Point No. 001) and EFF-002 (for Discharge Point No. 002) for hardness (1/month), chloride (1/month), total dissolved solids (1/month), temperature (1/week) and chronic toxicity (1/year) have been retained from Order No. R5-2006-0126 to provide the data necessary to evaluate the potential to exceed applicable water quality objectives.

Due to the fact that all wastewater flows are directed through settling ponds where they are mixed and homogenized prior to discharge through Discharge Point Nos. 001 and 002, the 24-hour flow-proportioned sample type for total dissolved solids has been changed to a grab sample.

4. Monitoring data collected over the existing permit term for cadmium, mercury, selenium, and total chromium did not demonstrate reasonable potential to exceed water quality objectives/criteria. Effluent limitations for BOD have not been retained in this Order. Thus, specific monitoring requirements for these constituents have not been retained from Order No. R5-2006-0126.
5. Specific effluent monitoring contained in Order No. R5-2006-0126 for aquaculture chemicals and drugs used at the Facilities is not being retained in this Order. These monitoring requirements are redundant with the drugs and other chemicals use reporting requirements required in section IX.A of the Monitoring and Reporting Program.
6. Priority pollutant data for the effluent has been provided by the Discharger over the term of Order No. R5-2006-0126, and was used to conduct a meaningful RPA. In accordance with Section 1.3 of the SIP, periodic monitoring for priority pollutants for which criteria or objectives apply and for which no effluent limitations have been

established. This Order requires monitoring prior to the expiration of the permit term in order to collect data to conduct an RPA for the next permit renewal. Monitoring for priority pollutants and other pollutants of concern will specifically be required one time during the permit term, at least 180 days but no more than 365 days prior to expiration of the Order. This frequency is considered adequate for these Facilities as the drugs and other chemicals use reporting requirements required in section IX.A of the Monitoring and Reporting Program already requires the submission of data that will be used by the Central Valley Board to assess the potential to impact receiving water quality and beneficial uses. See Attachment I for more detailed requirements related to performing priority pollutant monitoring.

7. California Water Code section 13176, subdivision (a), states: "The analysis of any material required by [Water Code sections 13000-16104] shall be performed by a laboratory that has accreditation or certification to Article 3 (commencing with Section 100825) of Chapter 4 of Part 1 of Division 101 of the Health and Safety Code." The Department of Public Health certifies laboratories through its Environmental Laboratory Accreditation Program (ELAP).

Section 13176 cannot be interpreted in a manner that would violate federal holding time requirements that apply to NPDES permits pursuant to the Clean Water Act. (Wat. Code §§ 13370, subd. (c), 13372, 13377.) Section 13176 is inapplicable to NPDES permits to the extent it is inconsistent with Clean Water Act requirements. (Wat. Code § 13372, subd. (a).) The holding time requirements are 15 minutes for chlorine residual, dissolved oxygen, and pH and immediate analysis is required for temperature. (40 CFR 136.3(e), Table II).

C. Whole Effluent Toxicity Testing Requirements

1. **Acute Toxicity.** Annual 96-hour bioassay testing is required to demonstrate compliance with the effluent limitation for acute toxicity. Due to the fact that all wastewater flows are directed through settling ponds where they are mixed and homogenized prior to discharge through Discharge Point Nos. 001 and 002, the

24-hour flow-proportioned sample type for acute toxicity has been changed to a grab sample.

2. **Chronic Toxicity.** Annual chronic whole effluent toxicity testing is required in order to demonstrate compliance with the Basin Plan's narrative toxicity objective. Due to the fact that all wastewater flows are directed through settling ponds where they are mixed and homogenized prior to discharge through Discharge Point Nos. 001 and 002, the 24-hour flow-proportioned sample type for chronic toxicity has been changed to a grab sample.

D. Receiving Water Monitoring

1. Surface Water

- a. Receiving water monitoring is necessary to assess compliance with receiving water limitations and to assess the impacts of the discharge on the receiving stream.
- b. Consistent with the effluent monitoring requirements, monitoring once prior to expiration of the permit term for priority pollutants at Monitoring Location RSW-001 and RSW-003 is required to collect the necessary data to determine reasonable potential as required in section 1.2 of the SIP. The hardness (as CaCO_3) of the upstream receiving water shall also be monitored concurrently with the priority pollutants as well as pH to ensure the water quality criteria/objectives are correctly adjusted for the receiving water when determining reasonable potential as specified in section 1.3 of the SIP. See Attachment I for more detailed requirements related to performing priority pollutant monitoring.

2. Groundwater

- a. Water Code section 13267 states, in part, "*(a) A Regional Water 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 Water 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 Water Board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports.” The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the Central Valley Water Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports. The Monitoring and Reporting Program is issued pursuant to Water Code section 13267. The groundwater monitoring and reporting program required by this Order and the Monitoring and Reporting Program are necessary to assure compliance with these waste discharge requirements. The Discharger is responsible for the discharges of waste at the facility subject to this Order.

- b. Monitoring of the groundwater must be conducted to determine if the discharge has caused an increase in constituent concentrations, when compared to background. The monitoring must, at a minimum, require a complete assessment of groundwater impacts including the vertical and lateral extent of degradation, an assessment of all wastewater-related constituents which may have migrated to groundwater, an analysis of whether additional or different methods of treatment or control of the discharge are necessary to provide best practicable treatment or control to comply with Resolution No. 68-16. Economic analysis is only one of many factors considered in determining best practicable treatment or control. If monitoring indicates that the discharge has incrementally increased constituent concentrations in groundwater above background, this permit may be reopened and modified. Until groundwater monitoring is sufficient, this Order contains Groundwater Limitations that allow groundwater quality to be degraded for certain constituents when compared to background groundwater quality, but not to exceed water quality objectives. If groundwater quality has been degraded by the discharge, the incremental change in pollutant

concentration (when compared with background) may not be increased. If groundwater quality has been or may be degraded by the discharge, this Order may be re opened and specific numeric limitations established consistent with Resolution No. 68-16 and the Basin Plan.

- c. As discussed in section III.E.2 of the Fact Sheet, except for EC and TDS, groundwater quality at monitoring wells down gradient from the settling ponds (Jamison Pond, Beaver Pond, and Curve Pond) and the evaporation/percolation pond are not substantially different from that measured at the up gradient background wells. This Order requires the Discharger to continue groundwater monitoring for EC and TDS and includes a regular schedule of groundwater monitoring in the attached Monitoring and Reporting Program. The groundwater monitoring reports are necessary to evaluate impacts to waters of the State to assure protection of beneficial uses and compliance with Central Valley Water Board plans and policies, including Resolution No. 68-16. Evidence in the record includes effluent monitoring data that indicates the presence of constituents that may degrade groundwater and surface water.

E. Other Monitoring Requirements

1. Drugs and Chemical Use

In months where drugs or chemicals are added to the waters of the Facility, concentrations shall be monitored during use. This requirement is consistent with the ELGs at 40 CFR Part 451 for concentrated aquatic animal production facilities that requires reporting on the use of drugs, disinfectants, and other chemicals in discharges authorized by NPDES permits.

2. Biosolids Monitoring - Not Applicable

3. Water Supply Monitoring - Not Applicable

4. Pond Monitoring

Treatment pond monitoring is required to ensure proper operation of Jamison Pond, Beaver Pond, Curve Pond, the Putah Creek Facility wetlands and the evaporation/percolation pond operated by the Discharger. Particularly, monthly monitoring for pH, dissolved oxygen, freeboard, color, odors, and electrical conductivity has been retained from Order No. R5-2006-0126. The same pond monitoring requirements are included in this Order for the proposed Aquatic Center Facility wetland channels.

Although a number of drugs and chemicals can be used as part of the operations at the Aquatic Disease Laboratory, this Order requires the use of best management practices to ensure proper use of drugs and chemicals, as well as to minimize the generation of pollutants that could impact surface or ground waters (see related discussion in Section IV.B.2 of this Fact Sheet). Further, drugs and chemicals are only used in the Aquatic Disease Laboratory periodically and for very short durations by the Discharger. The frequency and duration of use is highly variable and dictated by research needs. Therefore, routine monitoring for these other possible pollutants in the evaporation/percolation pond is not practical. However, this Order (in Section IX.A of the Monitoring and Reporting Program) requires the Discharger to report on the types and amounts of drugs and chemicals used in the Aquatic Disease Laboratory.

The Discharger is required to chlorinate discharges from the Aquatic Disease Laboratory to the evaporation/percolation pond. As chlorine may react with naturally-occurring organic materials in water to form byproducts which may pose health risks, additional monitoring for trihalomethanes (defined as the sum of bromodichloromethane, bromoform, dibromochloromethane, and chloroform) will be required in the evaporation/percolation pond. If monitoring data indicates the

presence of trihalomethanes in the ponds greater than applicable groundwater objectives, then this Order may be amended to require groundwater monitoring and/or establish numeric effluent limitations.

5. Land Discharge Monitoring - Not Applicable

6. Effluent and Receiving Water Characterization Study - Not Applicable

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with 40 CFR 122.41, and additional conditions applicable to specified categories of permits in accordance with 40 CFR 122.42, are provided in Attachment D. The discharger must comply with all standard provisions and with those additional conditions that are applicable under 40 CFR 122.42.

40 CFR 122.41(a)(1) and (b) through (n) establish conditions that apply to all State-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. 40 CFR 123.25(a)(12) allows the state to omit or modify conditions to impose more stringent requirements. In accordance with 40 CFR 123.25, this Order omits federal conditions that address enforcement authority specified in 40 CFR 122.41(j)(5) and (k)(2) because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387(e).

B. Special Provisions

1. Reopener Provisions

- a. Conditions that necessitate a major modification of a permit are described in 40 CFR 122.62, including the following:

- i. When standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision. Therefore, if more or less stringent applicable water quality standards are promulgated or approved pursuant to section 303 of the Federal Water Pollution Control Act or amendments thereto, the Central Valley Water Board will revise and modify this Order in accordance with such more or less stringent standards.
 - ii. When new information, that was not available at the time of permit issuance, would have justified different permit conditions at the time of issuance.
- b. **Whole Effluent Toxicity.** This Order requires the Discharger to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity through a Toxicity Reduction Evaluation (TRE). This Order may be reopened to include a numeric chronic toxicity limitation, a new acute toxicity limitation, and/or a limitation for a specific toxicant identified in the TRE. Additionally, if a numeric chronic toxicity water quality objective is adopted by the State Water Board, this Order may be reopened to include a numeric chronic toxicity limitation based on that objective.

2. Special Studies and Additional Monitoring Requirements

- a. **Chronic Whole Effluent Toxicity Requirements.** The Basin Plan contains a narrative toxicity objective that states, "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." (Basin Plan at page III-8.00.) Based on whole effluent chronic toxicity testing performed by the Discharger from July 2007 through July 2010, the discharge does not have reasonable potential to cause or contribute to an in-stream excursion above of the Basin Plan's narrative toxicity objective.

The Monitoring and Reporting Program of this Order requires chronic WET monitoring for demonstration of compliance with the narrative toxicity objective.

In addition to WET monitoring, this provision requires the Discharger to submit to the Central Valley Water Board an Initial Investigative TRE Workplan for approval by the Executive Officer, to ensure the Discharger has a plan to immediately move forward with the initial tiers of a TRE, in the event effluent toxicity is encountered in the future. The provision also includes a numeric toxicity monitoring trigger, requirements for accelerated monitoring, and requirements for TRE initiation if toxicity is demonstrated.

Monitoring Trigger. A numeric toxicity monitoring trigger of > 1 TUc (where TUc = 100/NOEC) is applied in the provision, because this Order does not allow any dilution for the chronic condition. Therefore, a TRE is triggered when the effluent exhibits toxicity at 100% effluent.

Accelerated Monitoring. The provision requires accelerated WET testing when a regular WET test result exceeds the monitoring trigger. The purpose of accelerated monitoring is to determine, in an expedient manner, whether there is toxicity before requiring the implementation of a TRE. Due to possible seasonality of the toxicity, the accelerated monitoring should be performed in a timely manner, preferably taking no more than 2 to 3 months to complete.

The provision requires accelerated monitoring consisting of four chronic toxicity tests in a six-week period (i.e., one test every two weeks) using the species that exhibited toxicity. Guidance regarding accelerated monitoring and TRE initiation is provided in the *Technical Support Document for Water Quality-based Toxics Control*, EPA/505/2-90-001, March 1991 (TSD). The TSD at page 118 states, “EPA recommends if toxicity is repeatedly or periodically present at levels above effluent limits more than 20 percent of the time, a TRE should be required.” Therefore, four accelerated monitoring tests are required in this provision. If no toxicity is demonstrated in the four accelerated tests, then it demonstrates that toxicity is not present at levels above the monitoring trigger more than 20 percent of the time (only 1 of 5 tests are toxic, including the initial test). However, notwithstanding the accelerated monitoring results, if there

is adequate evidence of effluent toxicity (i.e. toxicity present exceeding the monitoring trigger more than 20 percent of the time), the Executive Officer may require that the Discharger initiate a TRE.

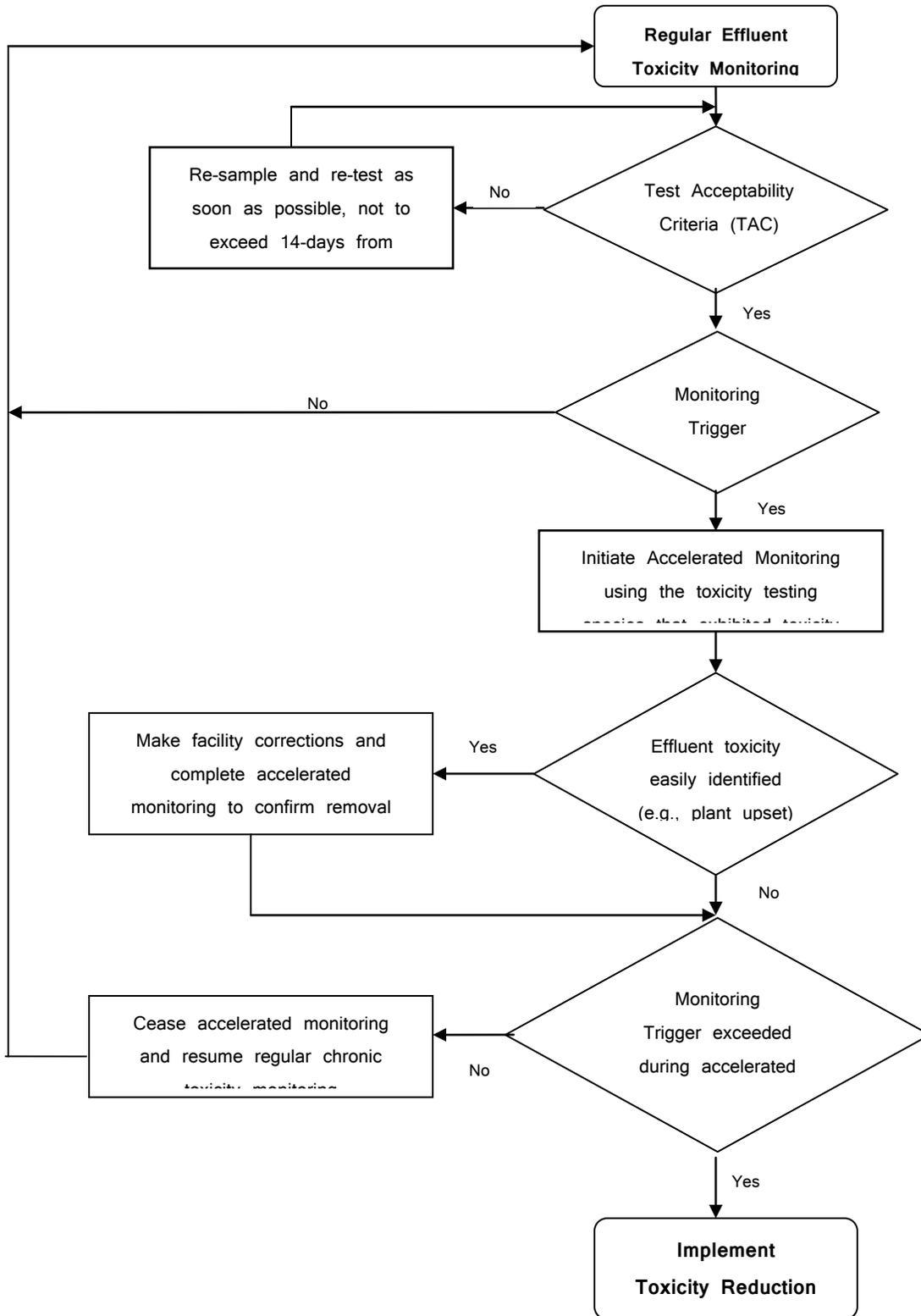
See the WET Accelerated Monitoring Flow Chart (Figure F-1), below, for further clarification of the accelerated monitoring requirements and for the decision points for determining the need for TRE initiation.

TRE Guidance. The Discharger is required to prepare a TRE Workplan in accordance with USEPA guidance. Numerous guidance documents are available, as identified below:

- Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants, EPA/833-B-99/002, August 1999.
- Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations (TREs), EPA/600/2-88/070, April 1989.
- Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures, Second Edition, EPA 600/6-91/003, February 1991.
- Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I, EPA/600/6-91/005F, May 1992.
- Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity, Second Edition, EPA/600/R-92/080, September 1993.
- Methods for Aquatic Toxicity Identification Evaluations: Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity, Second Edition, EPA 600/R-92/081, September 1993.

- Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, EPA-821-R-02-012, October 2002.
- Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA-821-R-02-013, October 2002.
- Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991.

Figure F-1
WET Accelerated Monitoring Flow Chart



b. Wetland Studies. If a study or multiple studies are planned, a work plan including at minimum the start date of the study, the planned duration of the study, and the flowrate and percentage of effluent entering the wetland under study must be submitted six months prior to the initiation of the study. If the Discharger decides to implement the studies as new operational procedures for the Aquatic Center and/or the Putah Creek Facility, the Discharger must furnish the data and study findings with its Report of Waste Discharge for the next NPDES Permit renewal for Central Valley Water Board approval.

3. Best Management Practices and Pollution Prevention

a. Best Management Practices (BMP) Plan. BMP 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. Although the Facilities are not defined as a Concentrated Aquatic Animal Production facility and thus subject to effluent guidelines, the Central Valley Water Board is requiring the development of a BMP Plan consistent with these effluent guidelines because of similarities in operations. These requirements will ensure that the Discharger develops and maintains a BMP Plan that addresses the following requirements: solids control, material storage, structural maintenance, record-keeping, and training.

Consistent with Order No. R5-2006-0126, and as discussed previously in section IV.C.3 of this Fact Sheet, the Discharger will be required to continue to implement an Evaluation and Minimization Plan for salinity as part of the BMP Plan to ensure adequate measures are developed and implemented by the Discharger to reduce the discharge of salinity.

The Discharger must make the BMP Plan available to the Central Valley Water Board upon request, and submit certification that the BMP Plan has been developed.

4. Construction, Operation, and Maintenance Specifications

- a. This Order retains the provision from Order No. R5-2006-0126 that requires the Facilities to be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency. This provision will ensure that operation and maintenance of the ponds does not impact surface waters in the vicinity of the Facilities.

5. Special Provisions for Municipal Facilities (POTWs Only) - Not Applicable

6. Other Special Provisions

- a. **Chemical and Aquaculture Drug Reporting Requirements.** As described in Section IV.B.1 of this Fact Sheet, the final ELGs for CAAP facilities at 40 CFR Part 451 includes reporting and narrative requirements related to chemical and aquaculture drug use. Although the Facilities are not subject to the ELGs, the Central Valley Water Board is including these reporting requirements in the Order:
 - i. Each facility must notify the permitting authority of the use of any investigational new animal drug (INAD) and any extra-label drug use where the use may lead to a discharge to waters of the United States.
 - ii. Each facility must report for failure in or damage to the structure of an aquatic animal containment system, resulting in an unanticipated material discharge of pollutant to waters of the United States.
 - iii. Each facility must develop and maintain a BMP Plan for solids control, material storage, structural maintenance, record keeping, and training.

Prior to using any new chemical or aquaculture drug at either Facility, the Discharger is required to notify the Central Valley Water Board of the proposed use. The notification must contain the toxicity testing results of the new chemical or aquaculture drug as specified in Section VI.C.6.a of this Order.

These reporting and toxicity testing requirements are needed for the Central Valley Water Board to determine if the discharge of a new drug or chemical by the Facility has 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 Plans, or narrative water quality objective for toxicity from the Basin Plans.

- b. **Waste Disposal.** The solid waste disposal provisions in this Order, 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. Other waste disposal specifications for drugs and chemicals are to prevent other unauthorized discharges to waters of the United States or waters of the State.

7. Compliance Schedules - Not Applicable

VIII. PUBLIC PARTICIPATION

The Central Valley Water Board is considering the issuance of WDRs that will serve as an NPDES permit for the Facility. As a step in the WDR adoption process, the Central Valley Water Board staff has developed tentative WDRs. The Central Valley Water Board encourages public participation in the WDR adoption process.

A. Notification of Interested Parties

The Central Valley Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Notification was provided through postings at the following:

- The nearest city hall or county courthouse,
- The post office nearest to the Facility (if allowed), and
- The public entrance of the Facility.

B. Written Comments

The staff determinations are tentative. Interested persons are invited to submit written comments concerning these tentative WDRs. Comments must be submitted either in person or by mail to the Executive Office at the Central Valley Water Board at the address above on the cover page of this Order.

To be fully responded to by staff and considered by the Central Valley Water Board, written comments must be received at the Central Valley Water Board offices by 5:00 p.m. on **9 March 2012**.

C. Public Hearing

The Central Valley Water Board will hold a public hearing on the tentative WDRs during its regular Board meeting on the following date and time and at the following location:

Date: **7/8 June 2012**
Time: 8:30 a.m.
Location: Regional Water Quality Control Board, Central Valley Region
 11020 Sun Center Dr., Suite #200
 Rancho Cordova, CA 95670

Interested persons are invited to attend. At the public hearing, the Central Valley Water Board will hear testimony, if any, pertinent to the discharge, WDRs, and permit. Oral testimony will be heard; however, for accuracy of the record, important testimony should be in writing.

Please be aware that dates and venues may change. Our Web address is www.waterboards.ca.gov/centralvalley where you can access the current agenda for changes in dates and locations.

D. Waste Discharge Requirements Petitions

Any aggrieved person may petition the State Water Board to review the decision of the Central Valley Water Board regarding the final WDRs. The petition must be submitted within 30 days of the Regional Water Board's action to the following address:

State Water Resources Control Board
Office of Chief Counsel
P.O. Box 100, 1001 I Street
Sacramento, CA 95812-0100

E. Information and Copying

The Report of Waste Discharge, related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through the Central Valley Water Board by calling (916) 464-3291.

F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the Central Valley Water Board, reference this Facility, and provide a name, address, and phone number.

G. Additional Information

Requests for additional information or questions regarding this order should be directed to Josh Palmer at (916) 464-4674.

ATTACHMENT G - SUMMARY OF REASONABLE POTENTIAL ANALYSIS

Table G-1. RPA Summary -Discharge Point No. 001

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
Aluminum, Total Recoverable	µg/L	50	220	87 ¹	--	--	--	--	--	200	No
Arsenic, Total Recoverable	µg/L	3.3	2.7	10	340	150	--	--	--	10	No
Cadmium, Total Recoverable	µg/L	<0.25	<0.25	3.1	6.2	3.1	--	--	--	5	No
Chloride	µg/L	409,400	23,000	106,000 ²	--	--	--	--	--	250,000	Yes
Chloroform	µg/L	2.1	--	80	--	--	--	--	--	80	No
Chromium (VI), Total Recoverable	µg/L	33	9.4	11	16	11	--	--	--	50	Yes
Chromium, Total	µg/L	25	7.8	50	--	--	--	--	--	50	No
Copper, Total Recoverable	µg/L	1.8	2.8	11	41 ³ /17 ⁴	25 ³ /12 ⁴	1,300	--	--	1,000	No
Electrical Conductivity @ 25°C	µmhos/cm	765	635	700 ²	--	--	--	--	--	900	Yes
Iron, Total Recoverable	µg/L	35	392	300	--	--	--	--	--	300	Yes
Manganese, Total Recoverable	µg/L	--	27	50	--	--	--	--	--	50	No
Mercury, Total Recoverable	µg/L	0.0032	0.0029	0.05	--	--	0.050	0.051	--	2	No

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
Nitrate Nitrogen, Total (as N)	µg/L	5,300	4,300	10,000	--	--	--	--	--	10,000	No
Selenium, Total Recoverable	µg/L	3.6	<2	5			20	5	--	50	No
Sulfate	µg/L	30,000	38,000	250,000	--	--	--	--	--	250,000	No
Total Dissolved Solids	µg/L	1,082,000	381,000	500,000	--	--	--	--	--	500,000	Yes
Zinc, Total Recoverable	µg/L	4.3	25	140	317 ³ /140 ⁴	317 ³ /156 ⁴	--	--	--	5,000	No

General Note: All inorganic concentrations are given as a total recoverable.
 MEC = Maximum Effluent Concentration
 B = Maximum Receiving Water Concentration or lowest detection level, if non-detect
 C = Criterion used for Reasonable Potential Analysis
 CMC = Criterion Maximum Concentration (CTR or NTR)
 CCC = Criterion Continuous Concentration (CTR or NTR)
 Water & Org = Human Health Criterion for Consumption of Water & Organisms (CTR or NTR)
 Org. Only = Human Health Criterion for Consumption of Organisms Only (CTR or NTR)
 Basin Plan = Numeric Site-specific Basin Plan Water Quality Objective
 MCL = Drinking Water Standards Maximum Contaminant Level
 NA = Not Available
 ND = Non-detect

Footnotes:
 (1) USEPA National Recommended Ambient Water Quality Criteria, Freshwater Aquatic Life Protection, 4-day Average.
 (2) Water Quality for Agriculture.
 (3) Criterion to be compared to the maximum effluent concentration.
 (4) Criterion to be compared to the maximum upstream receiving water concentration.
 (5) USEPA IRIS Reference Dose.

Table G-2. RPA Summary -Discharge Point No. 002

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
Aluminum, Total Recoverable	µg/L	89	320	87 ¹	--	--	--	--	--	200	Yes
Arsenic, Total Recoverable	µg/L	2.3	2.8	10	340	150	--	--	--	10	No
Cadmium, Total Recoverable	µg/L	<0.25	<0.25	2.9	5.8	2.9	--	--	--	5	No
Chloride	µg/L	288,160	22,000	106,000 ²	--	--	--	--	--	250,000	Yes
Chromium (VI), Total Recoverable	µg/L	22	9.3	11	16	11	--	--	--	50	Yes
Chromium, Total	µg/L	21	7.6	50	--	--	--	--	--	50	No
Copper, Total Recoverable	µg/L	1.2	3.1	11	22 ³ /17 ⁴	14 ³ /11 ⁴	1,300	--	--	1,000	No
Electrical Conductivity @ 25°C	µmhos/cm	819	645	700 ²	--	--	--	--	--	900	Yes
Iron, Total Recoverable	µg/L	240	450	300	--	--	--	--	--	300	Yes
Manganese, Total Recoverable	µg/L	--	32	50	--	--	--	--	--	50	No
Mercury, Total Recoverable	µg/L	0.0016	0.0031	0.05	--	--	0.050	0.051	--	2	No
Nitrate Nitrogen, Total (as N)	µg/L	8,200	4,200	10,000	--	--	--	--	--	10,000	No
Selenium, Total Recoverable	µg/L	<2	<2	5	--	--	20	5	--	50	No

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
Sulfate	µg/L	35,000	3,600	250,000	--	--	--	--	--	250,000	No
Total Dissolved Solids	µg/L	1,378,000	391,000	500,000	--	--	--	--	--	500,000	Yes
Zinc, Total Recoverable	µg/L	6.8	8	140	178 ³ /140 ⁴	178 ³ /140 ⁴	--	--	--	5,000	No

General Note: All inorganic concentrations are given as a total recoverable.

MEC = Maximum Effluent Concentration

B = Maximum Receiving Water Concentration or lowest detection level, if non-detect

C = Criterion used for Reasonable Potential Analysis

CMC = Criterion Maximum Concentration (CTR or NTR)

CCC = Criterion Continuous Concentration (CTR or NTR)

Water & Org = Human Health Criterion for Consumption of Water & Organisms (CTR or NTR)

Org. Only = Human Health Criterion for Consumption of Organisms Only (CTR or NTR)

Basin Plan = Numeric Site-specific Basin Plan Water Quality Objective

MCL = Drinking Water Standards Maximum Contaminant Level

NA = Not Available

ND = Non-detect

Footnotes:

- (1) USEPA National Recommended Ambient Water Quality Criteria, Freshwater Aquatic Life Protection, 4-day Average.
- (2) Water Quality for Agriculture.
- (3) Criterion to be compared to the maximum effluent concentration.
- (4) Criterion to be compared to the maximum upstream receiving water concentration.
- (5) USEPA IRIS Reference Dose.
- (6) Taste and odor threshold.

ATTACHMENT H - CALCULATION OF WQBELS

Table H-1. WQBELS -Discharge Point No. 001

Parameter	Units	Most Stringent Criteria			HH Calculations ¹				Aquatic Life Calculations ¹										Final Effluent Limitations	
		HH	CMC	CCC	ECA _{HH} = AMEL _{HH}	AMEL/MDEL Multiplier _{HH}	MDEL _{HH}	ECA _{acute}	ECA Multiplier _{acute}	LTA _{acute}	ECA _{chronic}	ECA Multiplier _{chronic}	LTA _{chronic}	Lowest LTA	AMEL Multiplier ₉₅	AMEL _{AL}	MDEL Multiplier ₉₉	MDEL _{AL}	Lowest AMEL	Lowest MDEL
Chromium (VI)	µg/L	50	11	16	50	1.4	68	16	0.61	10	11	0.78	8.9	8.9	1.2	11	1.6	15	11	15
Formaldehyde	mg/L	--	--	--	--	--	--	1.3	0.32	0.42	1.3	0.53	0.69	0.42	1.6	0.6	3.1	1.3	0.6	1.3

¹ As described in section IV.C.2.d of the Fact Sheet (Attachment F), calculation of effluent limitations for the protection of human health and aquatic life are determined without the allowance of dilution credits.

Table H-2. WQBELS -Discharge Point No. 002

Parameter	Units	Most Stringent Criteria			HH Calculations ¹				Aquatic Life Calculations ¹										Final Effluent Limitations	
		HH	CMC	CCC	ECA _{HH} = AMEL _{HH}	AMEL/MDEL Multiplier _{HH}	MDEL _{HH}	ECA _{acute}	ECA Multiplier _{acute}	LTA _{acute}	ECA _{chronic}	ECA Multiplier _{chronic}	LTA _{chronic}	Lowest LTA	AMEL Multiplier ₉₅	AMEL _{AL}	MDEL Multiplier ₉₉	MDEL _{AL}	Lowest AMEL	Lowest MDEL
Chromium (VI)	µg/L	50	11	16	50	1.53	76	16	0.51	8.33	11	0.70	8.0	8.0	1.3	10	2.0	16	10	16
Formaldehyde	mg/L	--	--	--	--	--	--	1.3	0.32	0.42	1.3	0.53	0.69	0.42	1.55	0.6	3.1	1.3	0.6	1.3

¹ As described in section IV.C.2.d of the Fact Sheet (Attachment F), calculation of effluent limitations for the protection of human health and aquatic life are determined without the allowance of dilution credits.

ATTACHMENT I - EFFLUENT AND RECEIVING WATER CHARACTERIZATION STUDY

I. Background. Sections 2.4.1 through 2.4.4 of the SIP provide minimum standards for analyses and reporting. (Copies of the SIP may be obtained from the State Water Resources Control Board, or downloaded from <http://www.waterboards.ca.gov/iswp/index.html>). To implement the SIP, effluent and receiving water data are needed for all priority pollutants. Effluent and receiving water pH and hardness are required to evaluate the toxicity of certain priority pollutants (such as heavy metals) where the toxicity of the constituents varies with pH and/or hardness. Section 3 of the SIP prescribes mandatory monitoring of dioxin congeners. In addition to specific requirements of the SIP, the Central Valley Water Board is requiring the following monitoring:

- A. Drinking water constituents.** Constituents for which drinking water Maximum Contaminant Levels (MCLs) have been prescribed in the California Code of Regulation are included in the *Water Quality Control Plan, Fourth Edition, for the Sacramento and San Joaquin River Basins* (Basin Plan). The Basin Plan defines virtually all surface waters within the Central Valley Region as having existing or potential beneficial uses for municipal and domestic supply. The Basin Plan further requires that, at a minimum, water designated for use as domestic or municipal supply shall not contain concentrations of chemical constituents in excess of the MCLs contained in the California Code of Regulations.
- B. Effluent and receiving water temperature.** This is both a concern for application of certain temperature-sensitive constituents, such as fluoride, and for compliance with the Basin Plan's thermal discharge requirements.
- C. Effluent and receiving water hardness and pH.** These are necessary because several of the CTR constituents are hardness and pH dependent.

II. Monitoring Requirements.

A. Monitoring Frequency and Location. The Discharger shall sample one time at least 180 days but no more than 365 days prior to expiration of this Order at Discharge Point No. 001 (EFF-001 and RSW-001) and Discharge Point No. 002 (EFF-002 and RSW-002). Samples shall be analyzed for the constituents listed in Table I-1. Each individual monitoring event shall provide representative sample results for the effluent and upstream receiving water.

B. Concurrent Sampling. Effluent and receiving water sampling shall be performed at approximately the same time, on the same date.

CD. Sample type. All effluent samples shall be taken as ~~24-hour flow-proportioned composite~~ grab samples. All receiving water samples shall be taken as grab samples.

Table I-1. Priority Pollutants

CTR #	Constituent	CAS Number	Criterion Quantitation Limit µg/L or noted	Suggested Test Methods
28	1,1-Dichloroethane	75343	0.5	EPA 8260B
30	1,1-Dichloroethene	75354	0.5	EPA 8260B
41	1,1,1-Trichloroethane	71556	0.5	EPA 8260B
42	1,1,2-Trichloroethane	79005	0.5	EPA 8260B
37	1,1,2,2-Tetrachloroethane	79345	0.5	EPA 8260B
75	1,2-Dichlorobenzene	95501	0.5	EPA 8260B
29	1,2-Dichloroethane	107062	0.5	EPA 8260B
	cis-1,2-Dichloroethene	156592	0.5	EPA 8260B
31	1,2-Dichloropropane	78875	0.5	EPA 8260B
101	1,2,4-Trichlorobenzene	120821	0.5	EPA 8260B
76	1,3-Dichlorobenzene	541731	0.5	EPA 8260B
32	1,3-Dichloropropene	542756	0.5	EPA 8260B
77	1,4-Dichlorobenzene	106467	0.5	EPA 8260B
17	Acrolein	107028	2	EPA 8260B
18	Acrylonitrile	107131	2	EPA 8260B
19	Benzene	71432	0.5	EPA 8260B

CTR #	Constituent	CAS Number	Criterion Quantitation Limit µg/L or noted	Suggested Test Methods
20	Bromoform	75252	0.5	EPA 8260B
34	Bromomethane	74839	1	EPA 8260B
21	Carbon tetrachloride	56235	0.5	EPA 8260B
22	Chlorobenzene (mono chlorobenzene)	108907	0.5	EPA 8260B
24	Chloroethane	75003	0.5	EPA 8260B
25	2- Chloroethyl vinyl ether	110758	1	EPA 8260B
26	Chloroform	67663	0.5	EPA 8260B
35	Chloromethane	74873	0.5	EPA 8260B
23	Dibromochloromethane	124481	0.5	EPA 8260B
27	Dichlorobromomethane	75274	0.5	EPA 8260B
36	Dichloromethane	75092	0.5	EPA 8260B
33	Ethylbenzene	100414	0.5	EPA 8260B
88	Hexachlorobenzene	118741	1	EPA 8260B
89	Hexachlorobutadiene	87683	1	EPA 8260B
91	Hexachloroethane	67721	1	EPA 8260B
94	Naphthalene	91203	10	EPA 8260B
38	Tetrachloroethene	127184	0.5	EPA 8260B
39	Toluene	108883	0.5	EPA 8260B
40	trans-1,2-Dichloroethylene	156605	0.5	EPA 8260B
43	Trichloroethene	79016	0.5	EPA 8260B
44	Vinyl chloride	75014	0.5	EPA 8260B
	Methyl-tert-butyl ether (MTBE)	1634044	0.5	EPA 8260B
	Trichlorofluoromethane	75694	5	EPA 8260B
	1,1,2-Trichloro-1,2,2-Trifluoroethane	76131	10	EPA 8260B
	Styrene	100425	0.5	EPA 8260B
	Xylenes	1330207	0.5	EPA 8260B
60	1,2-Benzanthracene	56553	5	EPA 8270C
85	1,2-Diphenylhydrazine	122667	1	EPA 8270C
45	2-Chlorophenol	95578	2	EPA 8270C
46	2,4-Dichlorophenol	120832	1	EPA 8270C
47	2,4-Dimethylphenol	105679	2	EPA 8270C
49	2,4-Dinitrophenol	51285	5	EPA 8270C

CTR #	Constituent	CAS Number	Criterion Quantitation Limit µg/L or noted	Suggested Test Methods
82	2,4-Dinitrotoluene	121142	5	EPA 8270C
55	2,4,6-Trichlorophenol	88062	10	EPA 8270C
83	2,6-Dinitrotoluene	606202	5	EPA 8270C
50	2-Nitrophenol	25154557	10	EPA 8270C
71	2-Chloronaphthalene	91587	10	EPA 8270C
78	3,3'-Dichlorobenzidine	91941	5	EPA 8270C
62	3,4-Benzofluoranthene	205992	10	EPA 8270C
52	4-Chloro-3-methylphenol	59507	5	EPA 8270C
48	4,6-Dinitro-2-methylphenol	534521	10	EPA 8270C
51	4-Nitrophenol	100027	5	EPA 8270C
69	4-Bromophenyl phenyl ether	101553	10	EPA 8270C
72	4-Chlorophenyl phenyl ether	7005723	5	EPA 8270C
56	Acenaphthene	83329	1	EPA 8270C
57	Acenaphthylene	208968	10	EPA 8270C
58	Anthracene	120127	10	EPA 8270C
59	Benzidine	92875	5	EPA 8270C
61	Benzo(a)pyrene (3,4-Benzopyrene)	50328	0.1	EPA 8270C
63	Benzo(g,h,i)perylene	191242	5	EPA 8270C
64	Benzo(k)fluoranthene	207089	2	EPA 8270C
65	Bis(2-chloroethoxy) methane	111911	5	EPA 8270C
66	Bis(2-chloroethyl) ether	111444	1	EPA 8270C
67	Bis(2-chloroisopropyl) ether	39638329	10	EPA 8270C
68	Bis(2-ethylhexyl) phthalate	117817	3	EPA 8270C
70	Butyl benzyl phthalate	85687	10	EPA 8270C
73	Chrysene	218019	5	EPA 8270C
81	Di-n-butylphthalate	84742	10	EPA 8270C
84	Di-n-octylphthalate	117840	10	EPA 8270C
74	Dibenzo(a,h)-anthracene	53703	0.1	EPA 8270C
79	Diethyl phthalate	84662	2	EPA 8270C
80	Dimethyl phthalate	131113	2	EPA 8270C
86	Fluoranthene	206440	10	EPA 8270C
87	Fluorene	86737	10	EPA 8270C
90	Hexachlorocyclopentadiene	77474	1	EPA 8270C

CTR #	Constituent	CAS Number	Criterion Quantitation Limit µg/L or noted	Suggested Test Methods
92	Indeno(1,2,3-c,d)pyrene	193395	0.05	EPA 8270C
93	Isophorone	78591	1	EPA 8270C
98	N-Nitrosodiphenylamine	86306	1	EPA 8270C
96	N-Nitrosodimethylamine	62759	5	EPA 8270C
97	N-Nitrosodi-n-propylamine	621647	5	EPA 8270C
95	Nitrobenzene	98953	10	EPA 8270C
53	Pentachlorophenol	87865	0.2	EPA 8270C
99	Phenanthrene	85018	5	EPA 8270C
54	Phenol	108952	1	EPA 8270C
100	Pyrene	129000	10	EPA 8270C
	Aluminum	7429905	50	EPA 6020/200.8
1	Antimony	7440360	5	EPA 6020/200.8
2	Arsenic	7440382	0.01	EPA 1632
15	Asbestos	1332214	0.2 MFL >10µm	EPA/600/R-93/116(PCM)
	Barium	7440393	100	EPA 6020/200.8
3	Beryllium	7440417	1	EPA 6020/200.8
4	Cadmium	7440439	0.25	EPA 1638/200.8
5a	Chromium (total)	7440473	2	EPA 6020/200.8
5b	Chromium (VI)	18540299	0.5	EPA 7199/1636
6	Copper	7440508	0.5	EPA 6020/200.8
14	Cyanide	57125	5	EPA 9012A
	Fluoride	7782414	0.1	EPA 300
	Iron	7439896	100	EPA 6020/200.8
7	Lead	7439921	0.5	EPA 1638
8	Mercury	7439976	0.0002 (11)	EPA 1669/1631
	Manganese	7439965	20	EPA 6020/200.8
9	Nickel	7440020	5	EPA 6020/200.8
10	Selenium	7782492	5	EPA 6020/200.8
11	Silver	7440224	1	EPA 6020/200.8
12	Thallium	7440280	1	EPA 6020/200.8
	Tributyltin	688733	0.002	EV-024/025
13	Zinc	7440666	10	EPA 6020/200.8
110	4,4'-DDD	72548	0.02	EPA 8081A

CTR #	Constituent	CAS Number	Criterion Quantitation Limit µg/L or noted	Suggested Test Methods
109	4,4'-DDE	72559	0.01	EPA 8081A
108	4,4'-DDT	50293	0.01	EPA 8081A
112	alpha-Endosulfan	959988	0.02	EPA 8081A
103	alpha-Hexachlorocyclohexane (BHC)	319846	0.01	EPA 8081A
	Alachlor	15972608	1	EPA 8081A
102	Aldrin	309002	0.005	EPA 8081A
113	beta-Endosulfan	33213659	0.01	EPA 8081A
104	beta-Hexachlorocyclohexane	319857	0.005	EPA 8081A
107	Chlordane	57749	0.1	EPA 8081A
106	delta-Hexachlorocyclohexane	319868	0.005	EPA 8081A
111	Dieldrin	60571	0.01	EPA 8081A
114	Endosulfan sulfate	1031078	0.05	EPA 8081A
115	Endrin	72208	0.01	EPA 8081A
116	Endrin Aldehyde	7421934	0.01	EPA 8081A
117	Heptachlor	76448	0.01	EPA 8081A
118	Heptachlor Epoxide	1024573	0.01	EPA 8081A
105	Lindane (gamma-Hexachlorocyclohexane)	58899	0.019	EPA 8081A
119	PCB-1016	12674112	0.5	EPA 8082
120	PCB-1221	11104282	0.5	EPA 8082
121	PCB-1232	11141165	0.5	EPA 8082
122	PCB-1242	53469219	0.5	EPA 8082
123	PCB-1248	12672296	0.5	EPA 8082
124	PCB-1254	11097691	0.5	EPA 8082
125	PCB-1260	11096825	0.5	EPA 8082
126	Toxaphene	8001352	0.5	EPA 8081A
	Atrazine	1912249	1	EPA 8141A
	Bentazon	25057890	2	EPA 643/515.2
	Carbofuran	1563662	5	EPA 8318
	2,4-D	94757	10	EPA 8151A
	Dalapon	75990	10	EPA 8151A
	1,2-Dibromo-3-chloropropane (DBCP)	96128	0.01	EPA 8260B

CTR #	Constituent	CAS Number	Criterion Quantitation Limit µg/L or noted	Suggested Test Methods
	Di(2-ethylhexyl)adipate	103231	5	EPA 8270C
	Dinoseb	88857	2	EPA 8151A
	Diquat	85007	4	EPA 8340/ 549.1/HPLC
	Endothal	145733	45	EPA 548.1
	Ethylene Dibromide	106934	0.02	EPA 8260B/504
	Glyphosate	1071836	25	HPLC/EPA 547
	Methoxychlor	72435	10	EPA 8081A
	Molinate (Ordram)	2212671	2	EPA 634
	Oxamyl	23135220	20	EPA 8318/632
	Picloram	1918021	1	EPA 8151A
	Simazine (Princep)	122349	1	EPA 8141A
	Thiobencarb	28249776	1	HPLC/EPA 639
16	2,3,7,8-TCDD (Dioxin)	1746016	5.00E-06	EPA 8290 (HRGC) MS
	2,4,5-TP (Silvex)	93765	1	EPA 8151A
	Diazinon	333415	0.25	EPA 8141A/GCMS
	Chlorpyrifos	2921882	1	EPA 8141A/GCMS
	Ammonia (as N)	7664417		EPA 350.1
	Boron	7440428	10	EPA 200.8
	Chloride	16887006		EPA 300.0
	Flow			
	Hardness (as CaCO ₃)			EPA 130.2
	Foaming Agents (MBAS)			SM5540C
	Nitrate (as N)	14797558	2,000	EPA 300.0
	Nitrite (as N)	14797650	400	EPA 300.0
	pH		0.1	EPA 150.1
	Phosphorus, Total (as P)	7723140		EPA 365.3
	Specific conductance (EC)			EPA 120.1
	Sulfate		500	EPA 300.0
	Sulfide (as S)			EPA 376.2
	Sulfite (as SO ₃)			SM4500-SO3
	Temperature			
	Total Dissolved Solids (TDS)			EPA 160.1

CTR #	Constituent	CAS Number	Criterion Quantitation Limit µg/L or noted	Suggested Test Methods
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III. Additional Study Requirements

- A. **Laboratory Requirements.** The laboratory analyzing the monitoring samples shall be certified by the Department of Health Services in accordance with the provisions of Water Code 13176 and must include quality assurance/quality control data with their reports (ELAP certified).

- B. **Criterion Quantitation Limit (CQL).** The criterion quantitation limits will be equal to or lower than the minimum levels (MLs) in Appendix 4 of the SIP or the detection limits for purposes of reporting (DLRs) below the controlling water quality criterion concentrations summarized in Table I-1 of this Order. In cases where the controlling water quality criteria concentrations are below the detection limits of all approved analytical methods, the best available procedure will be utilized that meets the lowest of the MLs and DLR. Table I-1 contains suggested analytical procedures. The Discharger is not required to use these specific procedures as long as the procedure selected achieves the desired minimum detection level.

- C. **Method Detection Limit (MDL).** The method detection limit for the laboratory shall be determined by the procedure found in 40 CFR Part 136, Appendix B (revised as of May 14, 1999).

- D. **Reporting Limit (RL).** The reporting limit for the laboratory. This is the lowest quantifiable concentration that the laboratory can determine. Ideally, the RL should be equal to or lower than the CQL to meet the purposes of this monitoring.

E. Reporting Protocols. The results of analytical determinations for the presence of chemical constituents in a sample shall use the following reporting protocols:

1. Sample results greater than or equal to the reported RL shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).
2. Sample results less than the reported RL, 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.
3. For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may shortened to "Est. Conc."). The laboratory, if such information is available, may include numerical estimates of the data quantity for the reported result. Numerical estimates of data quality may be percent accuracy (+ or - a percentage of the reported value), numerical ranges (low and high), or any other means considered appropriate by the laboratory.
4. Sample results that are less than the laboratory's MDL shall be reported as "Not Detected" or ND.

F. Data Format. The monitoring report shall contain the following information for each pollutant:

1. The name of the constituent.
2. Sampling location.
3. The date the sample was collected.
4. The time the sample was collected.
5. The date the sample was analyzed. For organic analyses, the extraction data will also be indicated to assure that hold times are not exceeded for prepared samples.
6. The analytical method utilized.
7. The measured or estimated concentration.
8. The required Criterion Quantitation Limit (CQL).
9. The laboratory's current Method Detection Limit (MDL), as determined by the procedure found in 40 CFR Part 136, Appendix B (revised as of May 14, 1999).
10. The laboratory's lowest reporting limit (RL).
11. Any additional comments.

