

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

CENTRAL VALLEY REGION

364 Knollcrest Drive, Suite 205 Redding, California 96002
Phone (530) 224-4845 • Fax (530) 224-4857
<http://www.waterboards.ca.gov/centralvalley>

ORDER NO. R5-2013-XXXX
NPDES NO. CA0078891

**WASTE DISCHARGE REQUIREMENTS FOR THE
CITY OF RED BLUFF
RED BLUFF WASTEWATER RECLAMATION PLANT
TEHAMA COUNTY**

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

Table 1. Discharger Information

Discharger	City of Red Bluff
Name of Facility	Red Bluff Wastewater Reclamation Plant
Facility Address	700 Messer Drive
	Red Bluff, CA 96080
	Tehama County
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board have classified this discharge as a major discharge.	

The discharge by the City of Red Bluff 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
EFF-001	Advanced-Secondary Treated Wastewater	40 ° 09' 45" N	122 ° 13' 00" W	Sacramento River

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>

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	City of Red Bluff
Name of Facility	Red Bluff Wastewater Reclamation Plant
Facility Address	700 Messer Drive
	Red Bluff, CA 96080
	Tehama County
Facility Contact, Title, and Phone	Mr. Bruce Henz, Public Works Director, (530) 527-2605
Mailing Address	555 Washington Street, Red Bluff, CA 96080
Type of Facility	Publicly Owned Treatment Works
Facility Design Flow	2.5 million gallons per day (mgd) (Average Dry Weather Flow)

II. FINDINGS

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

A. Background. The City of Red Bluff (hereinafter Discharger) was authorized to discharge pursuant to Order No. R5-2007-0041 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA0078891. The Discharger submitted a Report of Waste Discharge, dated 1 April 2011, and applied for a NPDES permit renewal to discharge up to an average monthly dry weather flow 2.5 mgd of treated wastewater from the Red Bluff Wastewater Reclamation Plant, hereinafter Facility. Central Valley Water Board staff declared this report incomplete and requested additional information. A supplemental report was submitted on 1 March 2012 and the application was deemed complete on 14 March 2012.

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 owns the Red Bluff Wastewater Reclamation Plant, an advanced secondary treatment wastewater reclamation plant. The treatment system consists of screening for removal of large solids, aerated grit removal, primary sedimentation, activated sludge treatment with secondary clarification, filtration, and chlorination/dechlorination. Primary and waste activated sludge are treated by aerobic digestion and stored in sludge storage basins, until dewatered and dried in sludge drying beds. Wastewater is discharged from Discharge Point No. EFF-001 (see table on cover page) to the Sacramento River, a water of the United States, within the Sacramento River Basin. Some of the treated wastewater is reclaimed and used for

irrigation along Interstate 5. Attachment B provides a map of the area around the Facility. Attachment C provides a flow schematic of the Facility.

- 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 (CWC; 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 CWC (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 I are also incorporated into this Order.
- E. California Environmental Quality Act (CEQA).** Under CWC 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 Secondary Treatment Standards at 40 CFR Part 133. 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. This Order contains requirements, expressed as technology equivalence requirements that are necessary to achieve water quality standards. The Central Valley Water Board has considered the factors listed in CWC section 13241 in establishing these requirements. The rationale for these requirements, which consist of advanced secondary treatment or equivalent requirements, is discussed in the Fact Sheet.

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. Table II-1 of the Basin Plan identifies the beneficial uses of certain specific water bodies. The Sacramento River (Shasta Dam to Colusa Basin Drain) is listed in Table II-1. 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 Sacramento River are as follows:

Table 5. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	<p align="center">Sacramento River (Shasta Dam to Colusa Basin Drain)</p>	<p>Municipal and domestic supply (MUN); Agricultural supply, including irrigation and stock watering (AGR); Industrial service supply (IND); Hydropower generation (POW); Water contact recreation, including canoeing and rafting (REC-1); Non-contact water recreation (REC-2); Warm freshwater habitat (WARM); Cold freshwater habitat (COLD); Migration of aquatic organisms, warm and cold (MIGR); Spawning, reproduction, and/or early development, warm and cold (SPWN); Wildlife habitat (WILD); and Navigation (NAV).</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.” The Sacramento River from Red Bluff to Knights Landing downstream of the discharge is listed on the 2010 303(d) list as impaired for DDT, dieldrin, mercury, and PCBs, with an expected TMDL completion date of 2021. The river segment is also listed as impaired for unknown toxicity with an expected TMDL completion date of 2019.

This Order requires the Discharger to monitor these parameters in the effluent and receiving water.

In 2007, the Central Valley Water Board adopted an amendment to the Basin Plan that addressed impairments within the Sacramento River and Feather River Basins by promulgating a water quality objective for diazinon and chlorpyrifos as well as an implementation program designed to ensure compliance with the new water quality objective. Per this implementation program, all NPDES permits for discharges (both direct and indirect) to the Sacramento or Feather Rivers must contain an effluent limit equivalent to the diazinon and chlorpyrifos water quality objective. This Order requires the Discharger to monitor the effluent for diazinon and chlorpyrifos, and includes effluent limitations for diazinon and chlorpyrifos.

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 and 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.** In general, an NPDES permit must include final effluent limitations that are consistent with CWA section 301 and with 40 CFR 122.44(d). There are exceptions to this general rule. The State Water Board's *Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits* (Compliance Schedule Policy) allows compliance schedules for new, revised, or newly interpreted water quality objectives or criteria, or in accordance with a TMDL. All compliance schedules must be as short as possible, and may not exceed ten years from the effective date of the adoption, revision, or new interpretation of the applicable water quality objective or criterion, unless a TMDL allows a longer schedule. A Regional Water Board, however, is not required to include a compliance schedule, but may issue a Time Schedule Order pursuant to Water Code section 13300 or a Cease and Desist Order pursuant to Water Code section 13301 where it finds that the discharger is violating or threatening to violate the permit. The Regional Water Board

will consider the merits of each case in determining whether it is appropriate to include a compliance schedule in a permit, and, consistent with the Compliance Schedule Policy, should consider feasibility of achieving compliance, and must impose a schedule that is as short as possible to achieve compliance with the effluent limit based on the objective or criteria.

The Compliance Schedule Policy and the SIP do not allow compliance schedules for priority pollutants beyond 18 May 2010, except for new or more stringent priority pollutant criteria adopted by USEPA after 17 December 2008.

Where a compliance schedule for a final effluent limitation exceeds one year, the Order must include interim numeric limitations for that constituent or parameter, interim milestones and compliance reporting within 14 days after each interim milestone. The permit may also include interim requirements to control the pollutant, such as pollutant minimization and source control measures. This Order does not include compliance schedules, interim effluent limitations and/or interim discharge specifications.

- 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 BOD₅, pH, flow, and TSS. The WQBELs consist of restrictions on diazinon, chlorpyrifos, copper, zinc, ammonia, acute toxicity, total coliform organisms, total residual chlorine, chlorodibromomethane, and dichlorobromomethane. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements. In addition, this Order includes new effluent limitations for ammonia and WQBELs for BOD₅, pH, and TSS to meet numeric objectives or protect beneficial uses. The rationale for including these limitations is explained in the Fact Sheet. In addition, the Central Valley Water Board has considered the factors in CWC section 13241 when appropriate in establishing these requirements.
- This Order contains pollutant restrictions that are more stringent than applicable federal requirements and standards. Specifically, this Order includes effluent limitations for BOD₅, TSS, and pH that are more stringent than applicable federal standards, but that are nonetheless necessary to meet numeric objectives or protect beneficial uses. The rationale for including these limitations is explained in the Fact Sheet (Attachment F section IV.C.3).
- 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 as the effluent limitations in Order No. R5-2007-0041. 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. Safe, Clean, Affordable, and Accessible Water.** In accordance with CWC Section 106.3, it is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking, and sanitary purposes. This Order promotes that policy by requiring discharges to meet maximum contaminant levels designed to protect human health and ensure that water is safe for domestic use.
- R. Monitoring and Reporting.** 40 CFR 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. CWC sections 13267 and 13383 authorize the Regional 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.

The technical and monitoring reports in this Order are required in accordance with Water Code section 13267, which states the following in subsection (b)(1), *"In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste*

outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.”

The Discharger owns and operates the Facility subject to this Order. The monitoring reports required by this Order are necessary to determine compliance with this Order. The need for the monitoring reports is discussed in the Fact Sheet.

- S. 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. Some special provisions require submittal of technical reports. All technical reports are required in accordance with Water Code section 13267. The rationale for the special provisions and need for technical reports required in this Order is provided in the Fact Sheet.
- T. Provisions and Requirements Implementing State Law.** The provisions/requirements in sections IV.B, IV.C, and V.B 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.
- U. 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.
- V. 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. R5-2007-0041 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 CWC (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 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).
- C. Neither the discharge nor its treatment shall create a nuisance as defined in section 13050 of the CWC.
- D. The Discharger shall not allow pollutant-free wastewater to be discharged into the collection, treatment, and 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.
- ~~E. The discharge of waste that causes violation of any narrative or numeric water quality objective contained in the Basin Plan is prohibited.~~

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Discharge Point No. EFF-001

1. Final Effluent Limitations – Discharge Point No. EFF-001

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

Table 6. Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Conventional Pollutants						
Biochemical Oxygen Demand (5-day @ 20° C)	mg/L	10	15	30	--	--
	lbs/day ¹	209	313	626	--	--
Total Suspended Solids	mg/L	10	15	30	--	--
	lbs/day ¹	209	313	626	--	--
pH	standard units	--	--	--	6.5	8.5
Priority Pollutants						
Chlorodibromomethane	µg/L	3.1	--	7.3	--	--
Copper, Total Recoverable	µg/L	34.0	--	71.8	--	--
Dichlorobromomethane	µg/L	14.5	--	33.6	--	--

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Conventional Pollutants						
Zinc, Total Recoverable	µg/L	275.4	--	543.9	--	--
Non-Conventional Pollutants						
Ammonia	mg/L	3.8	--	19.3	--	--

¹ Based on a design dry weather treatment capacity of 2.5 mgd

- b. **Percent Removal.** The average monthly percent removal of 5-day biochemical oxygen demand (BOD₅) and total suspended solids (TSS) shall not be less than 85 percent.
- c. **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.
- d. **Chlorpyrifos and Diazinon.** Effluent chlorpyrifos and diazinon concentrations shall not exceed the sum of one (1.0) as defined below:

Average Monthly Effluent Limitation

$$S_{AMEL} = \frac{C_{D-avg}}{0.079} + \frac{C_{C-avg}}{0.012} \leq 1.0$$

C_{D-avg} = average monthly diazinon effluent concentration in µg/L

C_{C-avg} = average monthly chlorpyrifos effluent concentration in µg/L

Maximum Daily Effluent Limitation

$$S_{MDEL} = \frac{C_{D-max}}{0.16} + \frac{C_{C-max}}{0.025} \leq 1.0$$

C_{D-max} = maximum daily diazinon effluent concentration in µg/L

C_{C-max} = maximum daily chlorpyrifos effluent concentration in µg/L

- e. **Total Residual Chlorine.** Effluent total residual chlorine shall not exceed:
 - i. 0.011 mg/L, as a 4-day average; and
 - ii. 0.019 mg/L, as a 1-hour average;
- f. **Total Coliform Organisms.** Effluent total coliform organisms shall not exceed:

- i. 23 most probable number (MPN) per 100 mL, as a 7-day median; and
- ii. 240 MPN/100 mL, more than once in any 30-day period.
- iii. A daily maximum of 500 MPN/100 mL.

g. Average Dry Weather Flow. The average dry weather discharge flow shall not exceed 2.5 million gallons per day (gpd).

2. Interim Effluent Limitations – Not Applicable

B. Land Discharge Specifications – LND-001 through LND-004

1. The discharge of waste classified as “hazardous” as defined in section 2521(a) of Title 23, California Code of Regulations (CCR), or “designated”, as defined in section 13173 of the CWC, to the storage basins is prohibited.
2. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the wastewater treatment and disposal areas.
3. As a means of discerning compliance with Land Discharge Specification B.2, the dissolved oxygen content in the upper zone (1 foot) of wastewater in the basins shall not be less than 1.0 mg/L.
4. Basins shall not have a pH less than 6.0 or greater than 9.0.
5. The wastewater and sludge storage basins shall be managed to prevent breeding of mosquitoes. In particular:
 - i. Weeds shall be minimized; and
 - ii. Dead algae, vegetation, and debris shall not accumulate on the water surface.
6. Public contact with the wastewater shall be precluded through such means as fences, signs, or other acceptable alternatives.
7. The wastewater storage basins shall have sufficient capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration during the non-irrigation season. 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. Freeboard shall never be less than two feet (measured vertically to the lowest point of overflow).

C. Reclamation Specifications – Discharge Point No. REC-001

1. The delivery or use of reclaimed water shall be in conformance with the criteria contained in Chapter 3, Division 4, Title 22, California Code of Regulations (CCR) (Section 60301, et seq.), or amendments thereto.

2. The discharge shall be in compliance with Water Recycling Requirements Order No. 5-01-262, adopted in December 2001, or revisions there to.
3. The Discharger shall maintain compliance with the following limitations at REC-001, with compliance measured at Monitoring Location REC-001 as described in the attached MRP.

Table 7. Reclamation Discharge Specifications

Parameter	Units	Discharge Specifications		
		7-day Median	Maximum Daily	Average Annual
Total Coliform Organisms	MPN/100 mL	23	240 ¹	n/a

¹ 240 MPN/mL in no more than one sample during a 30-day period.

V. RECEIVING WATER LIMITATIONS – RSW-001 AND RSW-002

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 Sacramento River:

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, and/or no 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.
 - d. From 1 June to 31 August: Concentrations of dissolved oxygen to fall below 9.0 mg/L. When natural conditions lower dissolved oxygen below this level, the concentration shall be maintained at or above 95 percent saturation.

- 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 or prescribed in Standard Methods for the Examination of Water and Wastewater, 18th Edition, or other equivalent methods approved by 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.
 - h.** Diazinon concentrations in excess of 0.080 µg/L (1-hour average) or 0.050 µg/L (4-day average) to occur more than once every three years on average.
- 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.

- 11. Salinity.** Electrical conductivity shall not exceed 230 $\mu\text{mhos/cm}$ (50 percentile) or 235 (90 percentile) at Knights Landing above Colusa Basin Drain, based upon previous 10 years of record.
- 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 storage, treatment, or disposal component associated with the WWTP shall not, in combination with other sources of the waste constituents, cause groundwater within influence of the WWTP to contain waste constituents in concentrations in excess of natural background quality or that listed

below, whichever is greater:

- a. Total coliform organisms over any 7-day period shall be less than 2.2 MPN/100 mL.
 - b. Nitrate plus nitrite (as N) shall not exceed 10 mg/L.
2. Groundwaters shall not contain concentrations of chemical constituents in excess of the maximum contaminant level (MCL) based upon drinking water standards Title 22, CCR.
 3. Groundwaters shall not contain taste or odor-producing substances in concentrations that cause nuisance or that adversely affect beneficial uses.

VI. PROVISIONS

A. Standard Provisions

1. The Discharger shall comply with all (federal NPDES standard conditions from 40 CFR Part 122) Standard Provisions 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 Regional 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 Regional 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 Regional 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 Regional 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 Regional 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 Regional 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 CWC, 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. (CWC 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 (530) 224-4845 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 Regional 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 CWC. 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:
 - 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. This Order may be reopened for modification, or revocation and reissuance, as a result of the detection of a reportable priority pollutant generated by special conditions included in this Order. These special conditions may be, but are not limited to, fish tissue sampling, whole effluent toxicity, monitoring requirements on internal waste stream(s), and monitoring for surrogate parameters. Additional requirements may be included in this Order as a result of the special condition monitoring data.
- c. **Mercury.** If mercury is found to be causing toxicity based on acute or chronic toxicity test results, or if a TMDL program is adopted, this Order shall be reopened and the interim mass effluent limitation modified (higher or lower) or an effluent concentration limitation imposed. If the Regional Water Board determines that a mercury offset program is feasible for Dischargers subject to a NPDES permit, then this Order may be reopened to reevaluate the interim mercury mass loading limitation(s) and the need for a mercury offset program for the Discharger.
- d. **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.
- e. **Water Effects Ratios (WER) and Metal Translators.** A default WER of 1.0 has been used in this Order for calculating CTR criteria for applicable priority pollutant inorganic constituents. In addition, default dissolved-to-total metal translators have been used to convert water quality objectives from dissolved to total recoverable when developing effluent limitations for copper and zinc. If the Discharger performs studies to determine site-specific WERs and/or site-specific dissolved-to-total metal translators, this Order may be reopened to modify the effluent limitations for the applicable inorganic constituents.
- d. **Constituent Study.** If after review of the study results it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of water quality objectives, this Order may be reopened and effluent limitations added for the subject constituents.

- e. **Mixing Zone/Dilution Confirmation Study.** Upon completion of the study, this Order may be reopened to add or modify dilution credits and/or mixing zones, as appropriate.
- f. **Dilution Credits.** The Central Valley Water Board may reopen this Order, as appropriate; to modify dilution credits should the facility performance, treatment or characteristics of the discharge or receiving water change. Modification of the dilution credit may include increasing the allowed dilution credit, if necessary.
- g. **Ammonia Reduction Study.** Upon completion of the Ammonia Reduction Study, this Order may be reopened to add or modify final ammonia effluent limitations and/or mixing zones, as appropriate.
- h. **Drinking Water Policy.** The Central Valley Water Board is developing a Drinking Water Policy. This Order may be reopened to incorporate monitoring of drinking water constituents to implement the Drinking Water Policy.
- i. **Diazinon and Chlorpyrifos Basin Plan Amendment.** Central Valley Water Board staff is developing a Basin Plan Amendment to provide an implementation plan for NPDES-permitted domestic wastewater dischargers. This Order may be reopened to modify diazinon and chlorpyrifos effluent limitations, as appropriate, in accordance with an amendment to the Basin Plan.

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 Regional 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 $> 2 TU_c$ (where $TU_c = 100/NOEC$). 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 adequate 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 Regional 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. Constituent Study.** Additional monitoring data is necessary in order to evaluate if reasonable potential to cause or contribute to an exceedance of water quality objectives and/or criteria exists for aluminum, nitrate, and nitrite. The Discharger shall conduct, at a minimum, monthly effluent monitoring of aluminum, nitrate, and nitrite in the effluent and quarterly monitoring of aluminum, nitrate, and nitrite in the receiving water during the first 2 years of the permit. A study report, evaluating the results of the monitoring and the constituent's potential effect to surface water, must be submitted **within 6 months following the completion of the final monitoring event.**
- c. Mixing Zone/Dilution Confirmation Study.** The Discharger is required to perform a Mixing Zone/Dilution Confirmation study, using a dye tracer, to verify the model results of the 2012 Mixing Zone and Dilution Study. **Within 6 months** of the effective date of this Order the Discharger shall submit a Mixing Zone/Dilution Confirmation Study workplan for approval by the Executive Officer. The final Confirmation Study shall be submitted no later than **2 years from the effective date of this Order.**
- d. Outfall Design Study.** The Discharger is required to conduct an Outfall Design Study. **Within 6 months** of the effective date of this Order, the Discharger shall submit an Outfall Design Study workplan for approval by the Executive Officer. The final Outfall Design Study shall be submitted no later than **2 years from the effective date of this Order.**

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.

- e. **Ammonia Reduction Study. 180 days prior to the expiration date of this Order**, the Discharger shall submit an ammonia reduction study. The study shall include a description of ammonia reduction measures implemented during the current permit cycle and/or scheduled for future implementation, site-specific constraints, if any, related to effluent ammonia reduction, and an evaluation of whether there are additional practicable ammonia reduction measures that may be implemented at the facility in order to reduce ammonia concentrations in the effluent and minimize the size of the ammonia mixing zone. If additional ammonia concentration reductions are practicable then the size of future mixing zones and dilution credits for ammonia may be reduced until such practicable concentration reductions have been achieved.

3. Best Management Practices and Pollution Prevention

- a. **Salinity Evaluation and Minimization Plan.** The Discharger shall prepare a salinity evaluation and minimization plan to identify and address sources of salinity from the Facility and evaluate efforts to minimize salt loading to the Sacramento River. The plan shall be completed and submitted to the Central Valley Water Board **within 9 months of the adoption date of this Order** for the approval by the Executive.

4. Construction, Operation and Maintenance Specifications

- a. The treatment facilities shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
- b. Public contact with wastewater shall be precluded through such means as fences, signs, and other acceptable alternatives.
- c. **Storage Pond Operating Requirements.**
 - i. The ponds shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
 - ii. Public contact with wastewater shall be precluded through such means as fences, signs, and other acceptable alternatives.
 - iii. Ponds shall be managed to prevent breeding of mosquitoes. In particular,
 - (a) An erosion control program should assure that small coves and irregularities are not created around the perimeter of the water surface.
 - (b) Weeds shall be minimized.
 - (c) Dead algae, vegetation, and debris shall not accumulate on the water surface.

- iv. Ponds shall have sufficient capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration during the non-irrigation season. 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. Freeboard shall never be less than 2 feet (measured vertically to the lowest point of overflow).
- v. Prior to the onset of the rainy season of each year, available pond storage capacity shall at least equal the volume necessary to comply with the Land Discharge Specification at section IV.C.4.a.iv., above.
- vi. The discharge of waste classified as “hazardous” as defined in section 2521(a) of Title 23, California Code of Regulations (CCR), or “designated”, as defined in section 13173 of the CWC, to the treatment ponds is prohibited.
- vii. 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).

5. Special Provisions for Municipal Facilities (POTWs Only)

- a. **Pretreatment Requirements.** The average dry weather design flow for the Facility is less than 5 mgd and the Facility does not receive discharges from Significant Industrial Users. Under these conditions, the Discharger is not required to develop a pretreatment program pursuant to USEPA regulations.
- b. **Sludge/Biosolids Discharge Specifications.** Sludge in this document means the solid, semisolid, and liquid residues removed during primary, secondary, or advanced wastewater treatment processes. Solid waste refers to grit and screening material generated during preliminary treatment. Residual sludge means sludge that will not be subject to further treatment at the wastewater treatment plant. Biosolids refer to sludge that has been treated and tested and shown to be capable of being beneficially and legally used pursuant to federal and state regulations as a soil amendment for agricultural, silvicultural, horticultural, and land reclamation activities as specified under 40 CFR Part 503.
 - i. Collected screenings, residual sludge, biosolids, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste, as set forth in Title 27, CCR, division 2, subdivision 1, section 20005, et seq. Removal for further treatment, disposal, or reuse at sites (e.g., landfill, composting sites, soil amendment sites) that are operated in accordance with valid waste discharge requirements issued by a Regional Water Board will satisfy these specifications.

- ii. Sludge and solid waste shall be removed from screens, sumps, ponds, clarifiers, etc. as needed to ensure optimal plant performance.
- iii. The treatment of sludge generated at the Facility shall be confined to the Facility property and conducted in a manner that precludes infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitations in section V.B. of this Order. In addition, the storage of residual sludge, solid waste, and biosolids on Facility property shall be temporary and controlled, and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitations included in section V.B. of this Order.
- iv. The use and disposal of biosolids shall comply with existing federal and state laws and regulations, including permitting requirements and technical standards included in 40 CFR Part 503. If the State Water Board and the Regional Water Board are given the authority to implement regulations contained in 40 CFR Part 503, this Order may be reopened to incorporate appropriate time schedules and technical standards. The Discharger must comply with the standards and time schedules contained in 40 CFR Part 503 whether or not they have been incorporated into this Order.
- v. The Discharger shall comply with Section IX.A. Biosolids of the Monitoring and Reporting Program, Attachment E.
- vi. Any proposed change in biosolids use or disposal practice from a previously approved practice shall be reported to the Executive Officer and USEPA Regional Administrator at least **90 days** in advance of the change.
- vii. **Within 180 days of the permit effective date**, the Discharger shall review and update its existing sludge/biosolids use or disposal plan, and submit it to the Central Valley Water Board. The updated plan shall describe at a minimum:
 - (a) Sources and amounts of sludge and/or biosolids generated annually.
 - (b) Location(s) of on-site storage and description of the containment area.
 - (c) Plans for ultimate disposal. For landfill disposal, include the Central Valley Water Board's waste discharge requirement numbers that regulate the particular landfill; the present classification of the landfill; and the name and location of the landfill.

c. Biosolids Storage and Transportation Specifications

Biosolids shall be considered to be "stored" if they are placed on the ground or in non-mobile containers (i.e. not in a truck or trailer) at an intermediate storage location away from the generator/processing for more than 48 hours. Biosolids

shall be considered to be “staged” if placed on the ground for brief periods of time solely to facilitate transfer of the biosolids between transportation and application vehicles.

- i. Biosolids shall not be stored directly on the ground at any one location for more than seven (7) consecutive days.
- ii. Facilities for the storage of Class B biosolids shall be located, designed and maintained to restrict public access to biosolids.
- iii. Biosolids storage facilities shall be designed and maintained to prevent washout or inundation from a storm or flood with a return frequency of 100 years.
- iv. Biosolids storage facilities, which contain biosolids, shall be designed and maintained to contain all storm water falling on the biosolids storage area during a rainfall year with a return frequency of 100 years.
- v. Biosolids placed on site for more than 24 hours shall be covered.
- vi. Biosolids storage facilities shall be designed, maintained and operated to minimize the generation of leachate and the effects of erosion.
- vii. If biosolids are to be stored at the site, a plan describing the storage program and means of complying with the specifications contained in sections VI.C.5.b and c of this Order shall be submitted for the Central Valley Water Board’s staff approval at least **90 days** in advance of the change. The storage plan shall also include an adverse weather plan.
- viii. The Discharger shall operate the biosolids storage facilities in accordance with the approved biosolids storage plan.
- ix. The Discharger shall immediately remove and relocate any biosolids stored on site in violation of this Order.
- x. All biosolids shall be transported in covered vehicles capable of containing the designated load.
- xi. All biosolids having a water content that is capable of leaching liquids shall be transported in leak proof vehicles.
- xii. Each biosolids transport driver shall be trained as to the nature of its load and the proper response to accidents or spill events and shall carry a copy of an approved spill response plan.
- xiii. The Discharger shall avoid the use of haul routes near residential land uses to the extent possible. If the use of haul routes near residential land uses cannot be avoided, the Discharger shall limit project-related truck traffic to daylight hours.

- d. **Collection System.** On 2 May 2006, the State Water Board adopted State Water Board Order No. 2006-0003, a Statewide General WDR for Sanitary Sewer Systems. The Discharger shall be subject to the requirements of Order No. 2006-0003 and any future revisions thereto. Order No. 2006-0003 requires that all public agencies that currently own or operate sanitary sewer systems apply for coverage under the General WDR. The Discharger has applied for and has been approved for coverage under State Water Board Order 2006-0003 for operation of its wastewater collection system.

- e. Limited portions of the wastewater collection system may be outside the service area of the Discharger. In order to assure compliance with Discharge Prohibitions against overflows and bypasses, and to assure protection of the entire collection system and treatment works from industrial discharges, it is necessary that the Discharger control discharges into the system. To control discharges into the entire collection system, the Discharger shall establish interagency agreements with the collection system users. The interagency agreements shall contain, at a minimum, requirements for reporting of unauthorized releases of wastewater, maintenance of the collection system, backup power or adequate wet well capacity at all pump stations to prevent overflows during power outages and pump failures, and pump station high water alarm notification systems. The Discharger shall comply with the following time schedule:

Task	Compliance Date
i. Submit interagency agreements for existing connections	Within 90 days after adoption of this Order
ii. Submit interagency agreements for new connections	30 days prior to connection

- f. This Order, and the Monitoring and Reporting Program which is a part of this permit, requires that certain parameters be monitored on a continuous basis. The wastewater treatment plant is not staffed on a full time basis. Permit violations or system upsets can go undetected during this period. The Discharger is required to establish an electronic system for operator notification for continuous recording device alarms. For existing continuous monitoring systems, the electronic notification system shall be installed within 6 months of adoption of this permit. For systems installed following permit adoption, the notification system shall be installed simultaneously.

6. Other Special Provisions – Not Applicable

7. Compliance Schedules – Not Applicable

VII. COMPLIANCE DETERMINATION

- A. BOD₅ and TSS Effluent Limitations (Section IV.A.1.).** Compliance with the final effluent limitations for BOD₅ and TSS required in Limitations and Discharge Requirements section IV.A.1.a shall be ascertained by 24-hour composite samples. Compliance with effluent limitations required in Limitations and Discharge Requirements section IV.A.1.b for percent removal shall be calculated using the arithmetic mean of BOD₅ and 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.** 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. Total Coliform Organisms Effluent Limitations (Section IV.A.1.f).** For each day that an effluent sample is collected and analyzed for total coliform organisms, the 7-day median shall be determined by calculating the median concentration of total coliform bacteria in the effluent utilizing the bacteriological results of the last 7 days. For example, if a sample is collected on a Wednesday, the result from that sampling event and all results from the previous 6 days (i.e., Tuesday, Monday, Sunday, Saturday, Friday, and Thursday) are used to calculate the 7-day median. If the 7-day median of total coliform organisms exceeds a most probable number (MPN) of 23 per 100 milliliters, the Discharger will be considered out of compliance.
- D. Mass Effluent Limitations.** The mass effluent limitations contained in the Final Effluent Limitations IV.A.1.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 IV.A.1.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.
- E. Total Residual Chlorine Effluent Limitations (Section IV.A.1.e.).** Continuous monitoring analyzers for chlorine residual or for dechlorination agent residual in the effluent are appropriate methods for compliance determination. A positive residual dechlorination agent in the effluent indicates that chlorine is not present in the discharge, which demonstrates compliance with the effluent limitations. This type of monitoring can also be used to prove that some chlorine residual exceedances are false positives. Continuous monitoring data showing either a positive dechlorination agent residual or a chlorine residual at or below the prescribed limit are sufficient to show compliance with the total residual chlorine effluent limitations, as long as the instruments are maintained and calibrated in accordance with the manufacturer's

recommendations.

Any excursion above the 1-hour average or 4-day average total residual chlorine effluent limitations is a violation. If the Discharger conducts continuous monitoring and the Discharger can demonstrate, through data collected from a back-up monitoring system, that a chlorine spike recorded by the continuous monitor was not actually due to chlorine, then any excursion resulting from the recorded spike will not be considered an exceedance, but rather reported as a false positive. Records supporting validation of false positives shall be maintained in accordance with Section IV Standard Provisions (Attachment D).

- F. Chlorpyrifos and Diazinon Effluent Limitations (Section IV.A.1.d).** Compliance shall be determined by calculating the sum (S), as provided in this Order, with analytical results that are reported as “non-detectable” concentrations to be considered to be zero.
- G. Reporting Due Dates.** For reports specified in this Order, if the due date is on a Saturday, Sunday, State Holiday, or a day the corresponding Water Board(s) office(s) is closed, the due date shall be on the next business day.
- H. Priority Pollutant Effluent Limitations.** Compliance with effluent limitations for priority pollutants shall be determined in accordance with Section 2.4.5 of the SIP, as follows:
1. Dischargers shall be deemed out of compliance with an effluent limitation, 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).
 2. Dischargers shall be required to conduct a Pollutant Minimization Program (PMP) in accordance with section 2.4.5.1 of the SIP when there is evidence that the priority pollutant is present in the effluent above an effluent limitation and either:
 - a. A sample result is reported as detected, but not quantified (DNQ) and the effluent limitation is less than the RL; or
 - b. A sample result is reported as non-detect (ND) and the effluent limitation is less than the method detection limit (MDL).
 3. When determining compliance with an average monthly effluent limitation (AMEL) and more than one sample result is available in a month, the discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of DNQ or ND. In those cases, the discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:
 - a. The data set shall be ranked from low to high, reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.
 - b. The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an

even number of data points, then the median is the average of the two values around the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

4. If a sample result, or the arithmetic mean or median of multiple sample results, is below the RL, and there is evidence that the priority pollutant is present in the effluent above an effluent limitation and the discharger conducts a PMP (as described in section 2.4.5.1), the discharger shall not be deemed out of compliance.

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 CWC 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 Regional Water Board may consider cost effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Study, if required pursuant to CWC 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)

The RL 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 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;

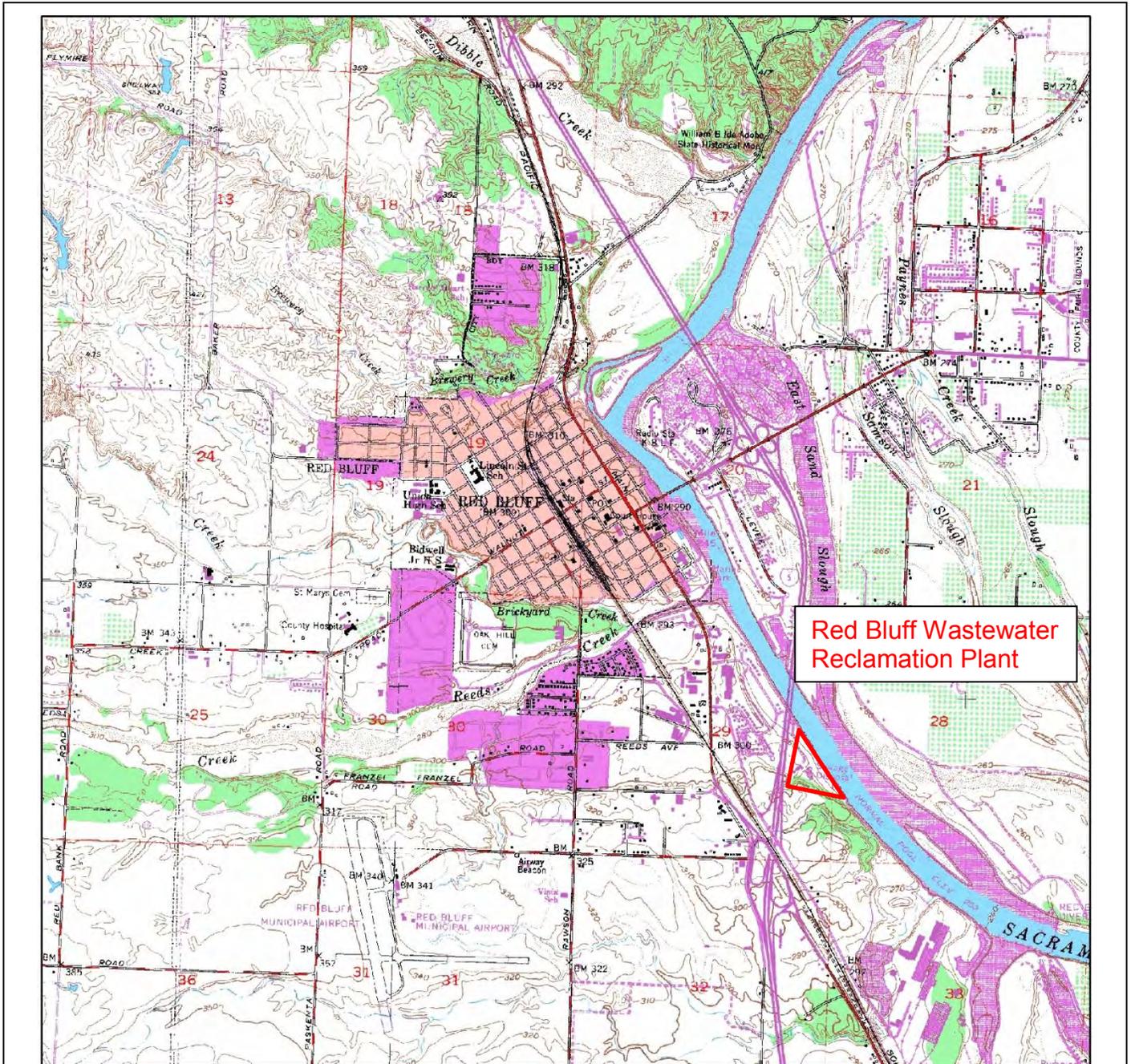
μ is the arithmetic mean of the observed values; and

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.)

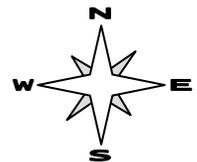
ATTACHMENT B – MAP



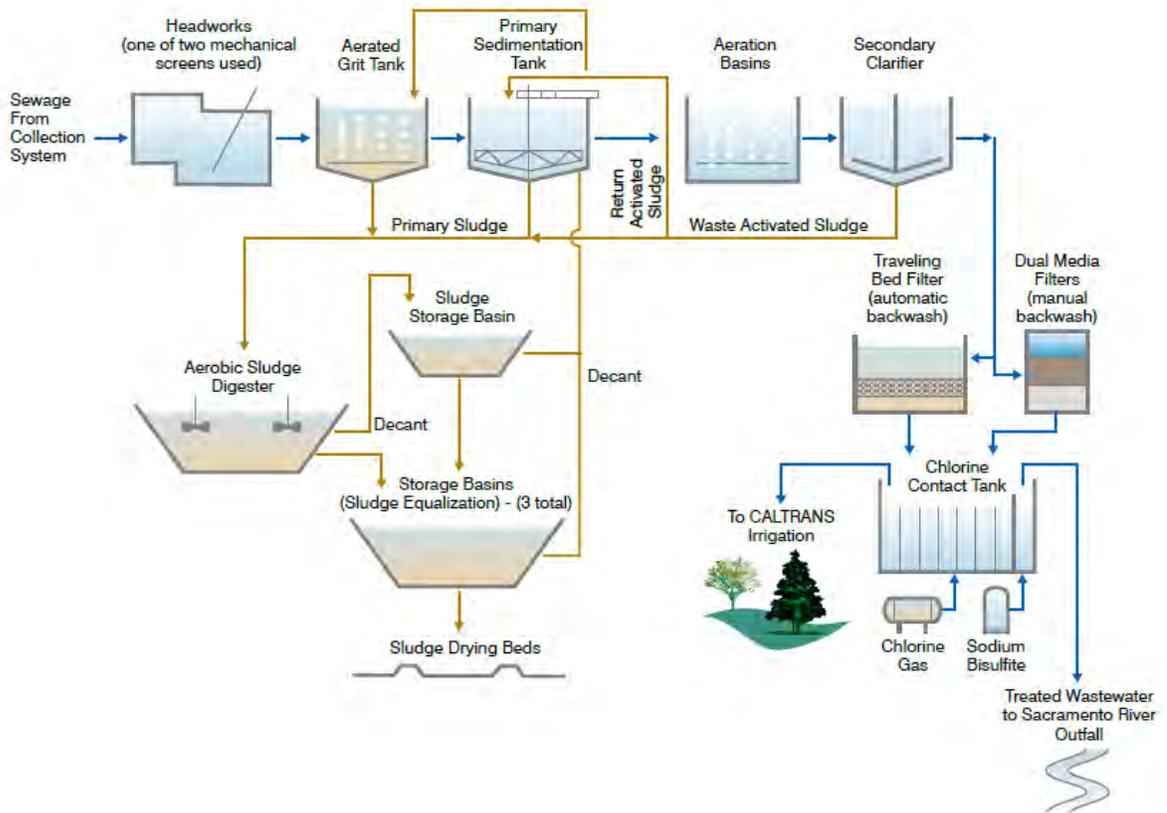
Red Bluff Wastewater
Reclamation Plant

Drawing Reference:
**RED BLUFF EAST &
RED BLUFF WEST**
U.S.G.S TOPOGRAPHIC MAP
7.5 MINUTE QUADRANGLE

SITE LOCATION MAP
**CITY OF RED BLUFF
RED BLUFF WASTEWATER
RECLAMATION PLANT
TEHAMA COUNTY**



ATTACHMENT C – FLOW SCHEMATIC



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ATTACHMENT D – STANDARD PROVISIONS

I. 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 (CWC) 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); CWC 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 CWC, 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));
 - b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance (40 CFR 122.41(m)(4)(i)(B)); and
 - c. The Discharger submitted notice to the Regional Water Board as required under Standard Provisions – Permit Compliance I.G.5 below. (40 CFR 122.41(m)(4)(i)(C).)
4. The Regional Water Board may approve an anticipated bypass, after considering its adverse effects, if the Regional Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above. (40 CFR 122.41(m)(4)(ii).)
5. Notice
 - a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass. (40 CFR 122.41(m)(3)(i).)
 - b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below (24-hour notice). (40 CFR 122.41(m)(3)(ii).)

H. Upset

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. (40 CFR 122.41(n)(1).)

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).)

II. 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 CWC. (40 CFR 122.41(l)(3) and 122.61.)

III. 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).)

IV. 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).)

V. 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 either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of USEPA). (40 CFR 122.22(a)(3).)
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 report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall

also be provided 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).)

VI. STANDARD PROVISIONS – ENFORCEMENT

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

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Publicly-Owned Treatment Works (POTWs)

All POTWs shall provide adequate notice to the Regional Water Board of the following (40 CFR 122.42(b)):

- 1.** Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to sections 301 or 306 of the CWA if it were directly discharging those pollutants (40 CFR 122.42(b)(1)); and
- 2.** Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of adoption of the Order. (40 CFR 122.42(b)(2).)
- 3.** Adequate notice shall include information on the quality and quantity of effluent introduced into the POTW as well as any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW. (40 CFR 122.42(b)(3).)

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 (CWC) sections 13267 and 13383 also authorize the Regional Water Quality Control Board (Regional 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

- B.** 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 this Regional Water Board.
- C.** 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.
- D.** 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, DO, 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.
- E.** 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.

- F. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this Monitoring and Reporting Program.
- G. Laboratories analyzing monitoring samples shall be certified by DPH, in accordance with the provision of CWC section 13176, and must include quality assurance/quality control data with their reports.
- H. 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.
- I. The Discharger shall file with the Regional Water Board technical reports on self-monitoring performed according to the detailed specifications contained in this Monitoring and Reporting Program.
- J. The results of all monitoring required by this Order shall be reported to the Regional 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
--	INF-001	Influent monitoring location
001	EFF-001	Effluent monitoring location
--	LND-001	Storage Basin No. 1 (Sludge Storage) – North Basin
--	LND-002	Storage Basin No. 2 (Sludge Equalization) – Northeast Basin
--	LND-003	Storage Basin No. 3 (Sludge Equalization) – Center/Middle Basin
--	LND-004	Storage Basin No. 4 (Sludge Equalization) – Southwest Basin
--	REC-001	Reclaimed water supply monitoring location
--	RSW-001	Upstream receiving water monitoring location
--	RSW-002	Downstream receiving water monitoring location (100 feet from EFF-001)
--	BIO-001	Biosolids (sludge) monitoring location
--	SPL-001	Municipal water supply sample location

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Location INF-001

The Discharger shall monitor influent to the facility at INF-001 as follows:

Table E-2. Influent Monitoring

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	mgd	meter/weir	Continuous	--
Biochemical Oxygen Demand (5-day 20° C)	mg/L	24-hr Composite	1/Week	1
	lbs/day	Calculate	1/Week	--
Total Suspended Solids	mg/L	24-hr Composite	1/Week	1
	lbs/day	Calculate	1/Week	--
pH		Grab ²	1/Week	1
Total Recoverable Metals ³	µg/L	24-hr Composite	1/Year	1

¹ Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136; or by methods approved by the Central Valley Water Board or the State Water Board.

² Grab samples shall not be collected at the same time each day to get a complete representation of variations in the influent.

³ Cadmium, copper, lead, nickel, silver, and zinc. Influent hardness and pH shall be determined at the same time. Sample shall be collected at the same time effluent sample is obtained for priority pollutant analysis.

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF-001

1. The Discharger shall monitor treated wastewater at EFF-001 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-3. Effluent Monitoring

Parameter	Units	Sample Type	Minimum Sampling Frequency	Notes
Flow	mgd	Meter	Continuous	--
Conventional Pollutants				
BOD ₅ (5-day @ 20 Deg. C)	mg/L	24-hr Composite	1/Week	1
	lbs/day	Calculate	1/Week	--
Total Suspended Solids	mg/L	24-hr Composite	1/Week	1
	lbs/day	Calculate	1/Week	--
pH		Grab	1/Day	1
Priority Pollutants				
Chlorodibromomethane	µg/L	Grab	1/Month	1, 2
Chlorpyrifos	µg/L	Grab	1/Year	2, 9
Copper, Total Recoverable	µg/L	24-hr. composite	1/Month	1, 2
Diazinon	µg/L	Grab	1/Year	2, 9
Dichlorobromomethane	µg/L	Grab	1/Month	1, 2
Zinc, Total Recoverable	µg/L	24-hr. composite	1/Month	1, 2
Non-Conventional Pollutants				
Ammonia Nitrogen, Total (as N)	mg/L	Grab	1/Month	1, 5, 8
Chlorine, Total Residual	mg/L	Meter	Continuous	1, 3
Electrical Conductivity @ 25° C	µmhos/cm	Grab	1/Month	1
Hardness (as CaCO ₃)	mg/L	Grab	1/Month	1, 10
Nitrate Nitrogen, Total (as N)	mg/L	Grab	1/Month	1
Nitrite Nitrogen, Total (as N)	mg/L	Grab	1/Month	1
Standard Minerals	mg/L	Grab	1/Year	1, 6
Temperature	°F	Grab	1/Month	1
Total Coliform Organisms	MPN/100 mL	Grab	2/Week	1
Total Dissolved Solids	mg/L	Grab	1/Month	1
Other				
Acute Toxicity (see Section V. below)	--	--	--	--
Chronic Toxicity (see Section V. below)	--	--	--	--
Priority Pollutants and Other Constituents of Concern	--	See Attachment I	See Attachment I	1, 2, 4, 7, 10

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

² For priority pollutant constituents with effluent limitations, Reporting Level (RL) 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 RL shall be the lowest ML. For priority pollutant constituents without effluent limitations, the reporting levels are listed in Attachment I, Table I-1. Priority Pollutants and Other Constituents of Concern.

-
- ³ Total chlorine residual must be monitored with a method sensitive to and accurate at the permitted level of 0.01 mg/L.
 - ⁴ Aluminum can be demonstrated using either total or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods, as supported by USEPA's Ambient Water Quality Criteria for Aluminum document (EPA 440/5-86-008), or other standard methods that exclude aluminum silicate particles as approved by the Executive Officer
 - ⁵ pH and temperature shall be recorded at the time of ammonia sample collection.
 - ⁶ Standard minerals shall include the following: boron, calcium, iron, magnesium, potassium, sodium, chloride, manganese, phosphorus, total alkalinity (including alkalinity series), and include verification that the analysis is complete (i.e., cation/anion balance).
 - ⁷ Unfiltered methyl mercury and total mercury samples shall be taken using clean hands/dirty hands procedures, as described in U.S. EPA method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels, for collection of equipment blanks (section 9.4.4.2), and shall be analyzed by U.S. EPA method 1630/1631 (Revision E) with a method detection limit of 0.02 ng/l for methylmercury and 0.2 ng/l for total mercury.
 - ⁸ Concurrent with Whole Effluent Toxicity Testing
 - ⁹ USEPA Method 625M, Method 8141, or equivalent. Minimum reporting limits: <100 ng/L diazinon; <15 ng/L chlorpyrifos.
 - ¹⁰ Hardness samples shall be collected concurrently with metals samples.

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:

1. Monitoring Frequency – The Discharger shall perform quarterly acute toxicity testing, concurrent with effluent ammonia sampling.
2. Sample Types – The Discharger may use flow-through or static renewal testing. For static renewal testing, the samples shall be flow or time proportional 24-hour composites and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent monitoring location EFF-001.
3. Test Species – Test species shall be rainbow trout (*Oncorhynchus mykiss*).
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 flow or time proportional 24-hour composite samples and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent monitoring location EFF-001. The receiving water control shall be a grab sample obtained from the RSW-001 upstream sampling location out of influence of the discharge sampling location, 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** – For regular and accelerated chronic toxicity monitoring, it is not necessary to perform the test using a dilution series. The test may be performed using 100% effluent and two controls. For TRE monitoring, the chronic toxicity testing shall be performed using the dilution series identified in Table E-4, below, unless use of an alternative diluent is detailed in the submitted TRE Action Plan, or when the receiving water is toxic.

Table E-4. Chronic Toxicity Testing Dilution Series

Sample	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 Regional 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 Regional Water Board within 30 days following completion of the test, and shall contain, at 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 TU_c, 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).

Items a through c, above, are only required when testing is performed using the full dilution series.

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, or as amended by the Discharger’s TRE Action Plan.
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

A. Monitoring Location(s) LND-001 through LND-004

1. The Discharger shall monitor the sludge treatment and storage ponds at LND-001 through LND-004 as follows:

Table E-5. Land Discharge Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency
Freeboard	Feet	Measurement	Weekly
Dissolved Oxygen	mg/L	Grab	Weekly

VII. RECLAMATION MONITORING REQUIREMENTS

A. Monitoring Location REC-001

1. The Discharger shall monitor reclaimed water at REC-001 as follows:

Table E-6. Reclamation Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency
Flow	gpd	Continuous	1/Day
Total Coliform Organisms	MPN/100 mL	Grab	1/Day

VIII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER

A. Monitoring Location RSW-001 and RSW-002

1. The Discharger shall monitor the Sacramento River at RSW-001 and RSW-002 as follows:

Table E-7. Receiving Water Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Conventional Pollutants				
pH	Standard Units	Grab	1/Week	1
Priority Pollutants				
Chlorodibromomethane	µg/L	Grab	1/Year ²	1, 3
Copper, Total Recoverable	µg/L	Grab	1/Month ^{2,5}	1, 3
Copper, Dissolved	µg/L	Grab	1/Month ^{2,5}	1, 3
Dichlorobromomethane	µg/L	Grab	1/Year ²	1, 3
Zinc, Total Recoverable	µg/L	Grab	1/Month ^{2,5}	1, 3
Zinc, Dissolved	µg/L	Grab	1/Month ^{2,5}	1, 3
Non-Conventional Pollutants				
Dissolved Oxygen	mg/L	Grab	1/Week	1
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/Week	1
Hardness (CaCO ₃)	mg/L	Grab	1/Month	1
Standard Minerals ⁴	mg/L	Grab	1/Year ²	1
Temperature	°F (°C)	Grab	1/Week	1
Turbidity	NTU	Grab	1/Week	1
Other				
Priority Pollutants and Other Constituents of Concern	µg/L	See Attachment I	See Attachment I	See Attachment I

¹ Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136 or by methods approved by the Central Valley Water Board or the State Water Board.

² Monitoring required at RSW-001 only.

³ See Attachment I for Reporting Level requirements.

⁴ Standard minerals shall include the following: boron, calcium, iron, magnesium, manganese, potassium, sodium, chloride, phosphorus, total alkalinity (including alkalinity series), and hardness, and include verification that the analysis is complete (i.e., cation/anion balance).

⁵ Receiving water hardness and pH required at time of sampling

2. In conducting receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations RSW-001 and RSW-002. Attention shall be given to the presence or absence of floating or suspended matter, aquatic life, discoloration, visible films/sheens, objectionable growths, and/or potential nuisance conditions.

IX. OTHER MONITORING REQUIREMENTS

A. Sludge/Biosolids

1. Monitoring Location BIO-001

- a. A composite sample of sludge shall be collected annually at Monitoring Location BIO-001 in accordance with EPA's *POTW Sludge Sampling and Analysis Guidance Document*, August 1989, and tested for priority pollutants listed in 40 CFR Part 122, Appendix D, Tables II and III (excluding total phenols).
- b. Sampling records shall be retained for a minimum of **5 years**. A log shall be maintained of sludge quantities generated and of handling and disposal activities. The frequency of entries is discretionary; however, the log must be complete enough to serve as a basis for part of the annual report.
- c. Upon removal of sludge, the Discharger shall submit characterization of sludge quality; including sludge percent solids and the most recent quantitative results of chemical analysis for the priority pollutants listed in 40 CFR 122 Appendix D, Tables II and III (excluding total phenols). Results shall be reported on a 100% dry-weight basis. Suggested methods for analysis of sludge are provided in USEPA publications titled "Test Methods for Evaluating Solid Waste: Physical/Chemical Methods" and "Test Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater". Recommended analytical holding times for sludge/biosolids samples should reflect those specified in 40 CFR 136.3(e). Other guidance is available.

B. Municipal Water Supply

1. Monitoring Location SPL-001

The Discharger shall monitor the municipal water supply at SPL-001 as follows. A sampling station shall be established where a representative sample of the municipal water supply can be obtained. Municipal water supply samples shall be collected at approximately the same time as effluent samples.

Table E-8. Municipal Water Supply Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Total Dissolved Solids ¹	mg/L	Grab	1/year	³
Electrical Conductivity @ 25°C ¹	µmhos/cm	Grab	1/Quarter	³
Standard Minerals ^{1,2}	mg/L	Grab	1/Year	³
Copper, Total Recoverable ¹	µg/L	Grab	1/Year	³
Zinc, Total Recoverable ¹	µg/L	Grab	1/Year	³

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
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- ¹ If the water supply is from more than one source, the total dissolved solids and electrical conductivity shall be reported as a weighted average and include copies of supporting calculations.
- ² Standard minerals shall include all major cations and anions and include verification that the analysis is complete (i.e., cation/anion balance).
- ³ Pollutants shall be analyzed using the analytical methods described in 40 CFR Part 136 or by methods approved by the Central Valley Water Board or the State Water Board.

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 Regional 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 Regional 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 Regional Water Board by letter when it returns to compliance with the compliance time schedule.
4. The Discharger shall report to the Regional 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 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. The Discharger shall report in the SMR the results for all monitoring specified in this Monitoring and Reporting Program under sections III through IX. The Discharger shall submit monthly, quarterly, semiannual, and annual SMRs including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. If the Discharger monitors any pollutant more

frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR.

3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-9. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On...	Monitoring Period	SMR Due Date
Continuous	Permit effective date	Continuous	Submit with monthly SMR
1/Hour	Permit effective date	Hourly	Submit with monthly SMR
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.	Submit with monthly SMR
1/Week	Permit effective date	Sunday through Saturday	Submit with monthly SMR
1/Month	Permit effective date	First day of calendar month through last day of calendar month	32 days from the end of the monitoring period
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	32 days from the end of the monitoring period
2/Year	Permit effective date	1 January through 30 June 1 July through 31 December	32 days from the end of the monitoring period
1/Year	Permit effective date	1 January through 31 December	32 days from the end of the monitoring period

4. **Reporting Protocols.** The Discharger shall report with each sample result the applicable Reporting Level (RL) 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 RL 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

7. Calculation Requirements. The following shall be calculated and reported in the SMRs:

- a. Annual Average Limitations.** For constituents with effluent limitations specified as “annual average” the Discharger shall report the annual average in the December SMR. The annual average shall be calculated as the average of the samples gathered for the calendar year.
- b. Mass Loading Limitations.** For BOD₅, TSS, and ammonia, the Discharger shall calculate and report the mass loading (lbs/day) in the SMRs. The mass loading shall be calculated as follows:

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

When calculating daily mass loading, the daily average flow and constituent concentration shall be used. For weekly average mass loading, the weekly average flow and constituent concentration shall be used. For monthly average mass loading, the monthly average flow and constituent concentration shall be used.

- c. Removal Efficiency (BOD5 and TSS).** The Discharger shall calculate and report the percent removal of BOD₅ and TSS in the SMRs. The percent removal shall be calculated as specified in Section VII.A. of the Limitations and Discharge Requirements.
- d. Total Coliform Organisms Effluent Limitations.** The Discharger shall calculate and report the 7-day median of total coliform organisms for the effluent. The 7-day median of total coliform organisms shall be calculated as specified in Section VII.C. of the Limitations and Discharge Requirements.
- e. Dissolved Oxygen Receiving Water Limitations.** The Discharger shall calculate and report monthly in the self-monitoring report: i) the dissolved oxygen concentration, ii) the percent of saturation in the main water mass, and iii) the 95th percentile dissolved oxygen concentration.
- f. Turbidity Receiving Water Limitations.** The Discharger shall calculate and report the turbidity increase in the receiving water applicable to the natural turbidity condition specified in Section V.A.18.a-e. of the Limitations and Discharge Requirements.
- g. Temperature Receiving Water Limitations.** The Discharger shall calculate and report the temperature increase in the receiving water based on the difference in temperature at Monitoring Locations RSW-001 and RSW-002

8. 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 Regional 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
 364 Knollcrest Drive, Suite #205
 Redding, CA 96002

C. Discharge Monitoring Reports (DMRs)

- 1. As described in section X.B.1 above, at any time during the term of this permit, the State Water Board or Regional Water Board may notify the Discharger to electronically submit SMRs that will satisfy federal requirements for submittal of Discharge Monitoring Reports (DMRs). Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.
- 2. DMRs must be signed and certified as required by the standard provisions (Attachment D). The Discharger shall submit the original DMR and one copy of the DMR to the address listed below:

STANDARD MAIL	FEDEX/UPS/ OTHER PRIVATE CARRIERS
State Water Resources Control Board Division of Water Quality c/o DMR Processing Center PO Box 100 Sacramento, CA 95812-1000	State Water Resources Control Board Division of Water Quality c/o DMR Processing Center 1001 I Street, 15 th Floor Sacramento, CA 95814

3. All discharge monitoring results must be reported on the official USEPA pre-printed DMR forms (EPA Form 3320-1). Forms that are self-generated will not be accepted unless they follow the exact same format of EPA Form 3320-1.

D. Other Reports

1. The Discharger shall report the results of any special studies, acute and chronic testing, and TRE/TIE required by Special Provisions VI.C.2 of this Order. The Discharger shall submit reports within the timeframes described or by the specified due dates.
2. Within 60 days of permit adoption, the Discharger shall submit a report outlining reporting levels (RLs), method detection limits, and analytical methods for approval. The Discharger shall comply with the monitoring and reporting requirements for CTR constituents as outlined in section 2.3 and 2.4 of the SIP. The maximum required reporting levels for priority pollutant constituents shall be based on the Minimum Levels (MLs) contained in Appendix 4 of the SIP, determined in accordance with Section 2.4.2 and Section 2.4.3 of the SIP. In accordance with Section 2.4.2 of the SIP, when there is more than one ML value for a given substance, the Central Valley Water Board shall include as RLs, in the permit, all ML values, and their associated analytical methods, listed in Appendix 4 that are below the calculated effluent limitation. The Discharger may select any one of those cited analytical methods for compliance determination. If no ML value is below the effluent limitation, then the Central Valley Water Board shall select as the RL, the lowest ML value, and its associated analytical method, listed in Appendix 4 for inclusion in the permit. Table I-1 (Attachment I) provides required maximum reporting levels in accordance with the SIP.
3. **Effluent and Receiving Water Characterization Study.** An effluent and receiving water monitoring study is required to ensure adequate information is available for the next permit renewal. During the third year of this permit term, the Discharger shall conduct quarterly monitoring of the effluent at EFF-001 and of the receiving water at RSW-001 for all priority pollutants and other constituents of concern as described in Attachment I.
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 Regional 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.

5. Annual Pretreatment Reporting Requirements. Not Applicable

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	5A520101001
Discharger	City of Red Bluff
Name of Facility	Red Bluff Wastewater Reclamation Plant
Facility Address	700 Messer Drive
	Red Bluff, CA 96080
	Tehama County
Facility Contact, Title and Phone	Mr. Bruce Henz, Public Works Director, (530) 527-2605
Authorized Person to Sign and Submit Reports	Mr. Bruce Henz, Public Works Director, (530) 527-2605
Mailing Address	555 Washington Street, Red Bluff, CA 96080
Billing Address	SAME
Type of Facility	Publicly Owned Treatment Works
Major or Minor Facility	Major
Threat to Water Quality	1
Complexity	A
Pretreatment Program	N
Reclamation Requirements	State of California, Department of Transportation, Order No. 5-01-262
Facility Permitted Flow	2.5 million gallons per day (mgd)
Facility Design Flow	2.5 mgd (ADWF)
Watershed	Sacramento Basin
Receiving Water	Sacramento River
Receiving Water Type	Inland surface water

A. Southwest Water Company is the contracted operator of the Red Bluff Wastewater Reclamation Plant (Facility). The City of Red Bluff owns the Facility and property at 700 Messer Drive, Red Bluff, CA on which the Facility is located. The City of Red Bluff is hereinafter referred to as Discharger.

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 Facility discharges wastewater to the Sacramento River, a water of the United States, and is currently regulated by Order No. R5-2007-0041, which was adopted on 4 May 2007 and expired on 1 May 2012. The terms and conditions of the current Order have been automatically continued and remain in effect until new Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit are adopted pursuant to this Order.
- C.** The Discharger filed an application/report of waste discharge for renewal of its Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit on 1 April 2011, to continue discharging up to an average dry weather flow of 2.5 mgd of treated wastewater from the Red Bluff Wastewater Reclamation Plant, hereinafter Facility. Central Valley Water Board staff declared this report incomplete and requested additional information. A supplemental report was submitted on 1 March 2012 and the application was deemed complete on 13 March 2012.

II. FACILITY DESCRIPTION

The Discharger provides sewerage service for the community of Red Bluff and serves a population of approximately 14,000. The design daily average flow capacity of the Facility is 2.5 million gallons per day (mgd).

A. Description of Wastewater and Biosolids Treatment or Controls

The treatment system at the Facility consists of bar screening; aerated grit removal, primary sedimentation, biological treatment by activated sludge, secondary sedimentation; filtration; disinfection; and dechlorination. Primary and waste activated sludge is aerobically digested then dewatered in sludge drying beds. Dried biosolids are hauled to a landfill.

B. Discharge Points and Receiving Waters

1. The Facility is located in Section 29, T27N, R3W, MDB&M, as shown in Attachment B, a part of this Order.
2. Treated municipal wastewater is discharged at Discharge Point No. EFF-001 to the Sacramento River, a water of the United States at a point latitude 40° 09' 45" N and longitude 122° 13' 00" W.
3. The discharge point EFF-001 is within the Tehama Hydrologic Unit, Red Bluff Hydrologic Area (504.20), as depicted on interagency hydrologic maps prepared by California Department of Water Resources (DWR) in August 1986.

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

Effluent limitations and/or Discharge Specifications contained in Order No. R5-2007-0041 for discharges from Discharge Point No. EFF-001 (Monitoring Location EFF-001) and representative monitoring data from the term of Order No. R5-2007-0041 are as follows:

Table F-2. Historic Effluent Limitations and Monitoring Data

Parameter	Units	Effluent Limitation			Monitoring Data September 2008 to October 2011		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
Flow	MGD	2.5	--		1.7	--	3.0
Conventional Pollutants							
BOD ₅	mg/L	10	15	30	1.6	7.1	7.1
TSS	mg/L	10	15	30	2.5	16.6	16.6
pH	S.U.	--	--	6.0 – 9.0	7.1	7.3	6.9 – 7.6
Priority Pollutants							
CDBM ¹	µg/L	8.24	--	16.53	2.0 ⁵	--	2.0
Copper ¹	µg/L	15.56	--	31.21	30.4 ⁵	--	30.4
DCBM ¹	µg/L	13.32	--	26.72	13.0 ⁵	--	13.0
Zinc ¹	µg/L	116.25	--	233.25	246 ⁵	--	249
Non-Conventional Pollutants							
EC ²	µmhos/cm	700	--		534 ⁴	--	676
Total Coliform Organisms ³	MPN/100 mL	23	--	500	16.6	2.0 ⁶	50
TDS ²	mg/L	450	--	1,000	389 ⁴	--	482

Notes: All metals in total recoverable. CDBM: Chlorodibromomethane. DCBM: Dichlorobromomethane.

- ¹ Data range: September 2008 through December 2012.
- ² Data range: January 2007 through December 2012.
- ³ Date range: June 2009 through November 2011.
- ⁴ Maximum annual average.
- ⁵ Average monthly value based on a single sample.
- ⁶ Median.

D. Compliance Summary

The following is a summary of violations noted during the monthly monitoring and reporting review since the last permit cycle:

<u>Time Period</u>	<u>Violation Description</u>
July 2007	Deficient Monitoring (missing information)
January 2010	Zinc Effluent Limit Violation – Maximum Daily
September 2010	Zinc Effluent Limit Violation – Maximum Daily

<u>Time Period</u>	<u>Violation Description</u>
March 2012	Zinc Effluent Limit Violation – Average Monthly
December 2012	Copper Effluent Limit Violation – Maximum Daily

E. Planned Changes

The Discharger has not submitted any planned changes to the Central Valley Water Board.

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 (CWC) 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)*
- 2. 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.
- 3. State Implementation Policy (SIP).** This Order implements the SIP as specified in the Finding contained at section II.I of this Order.
- 4. Alaska Rule.** This Order is consistent with the Alaska Rule as specified in the Finding contained at section II.L of this Order.
- 5. 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 section

131.12 and State Water Resources Control Board (State Water Board) Resolution 68-16.

- 6. Anti-Backsliding Requirements.** This Order is consistent with anti-backsliding policies as specified in the Finding contained at section II.M of this Order. Compliance with the anti-backsliding requirements is discussed in the Fact Sheet (Attachment F, Section IV.D.3).

7. Emergency Planning and Community Right to Know Act

Section 13263.6(a) of the CWC, requires that *“the Regional Water Board shall prescribe effluent limitations as part of the waste discharge requirements of a POTW for all substances that the most recent toxic chemical release data reported to the state emergency response commission pursuant to Section 313 of the Emergency Planning and Community Right to Know Act of 1986 (42 U.S.C. Sec. 11023) (EPCRA) indicate as discharged into the POTW, for which the State Water Board or the Regional Water Board has established numeric water quality objectives, and has determined that the discharge is or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to, an excursion above any numeric water quality objective”*.

The Central Valley Water Board has adopted numeric receiving water objectives for copper, zinc, ammonia, dichlorobromomethane, and chlorodibromomethane in the Basin Plan. As detailed elsewhere in this Permit, available effluent water quality data indicate that effluent concentrations of copper, zinc, ammonia, dichlorobromomethane, and chlorodibromomethane have reasonable potential to contribute to an excursion above numeric water quality objectives for those constituents included in the Basin Plan. Effluent limitations for copper, zinc, ammonia, dichlorobromomethane, and chlorodibromomethane are included in this permit pursuant to Water Code section 13263.6(a).

8. 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 wastewater treatment facilities. Wastewater treatment plants are applicable industries under the storm water program and are obligated to comply with the federal regulations. This facility is currently enrolled in the General NPDES Industrial Storm Water Permit.

- 9. 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

- 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 30 November 2006 USEPA gave final approval to California's 2006 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 Sacramento River has been identified on the 303(d) list as an impaired water body due to elevated concentrations of diazinon and chlorpyrifos. In addition, the Sacramento River, from Red Bluff to Knights Landing, is listed as a WQLS for DDT, dieldrin, mercury, PCBs, and unknown toxicity in the 303(d) list of impaired water bodies.

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. The listing for unknown toxicity has a proposed TMDL completion date of 2019. The listing for DDT, dieldrin, mercury, and PCBs has a proposed TMDL completion date of 2021. In 2007, the Central Valley Water Board adopted an amendment to the Basin Plan that addressed impairments within the Sacramento River and Feather River Basins by promulgating a water quality objective for diazinon and chlorpyrifos as well as an implementation program designed to ensure compliance with the new water quality objective. Per this implementation program, all NPDES permits for discharges (both direct and indirect) to the Sacramento or Feather Rivers must contain an effluent limit equivalent to the diazinon and chlorpyrifos water quality objective. This Order requires the Discharger to monitor the effluent for diazinon and chlorpyrifos, and includes effluent limitations for diazinon and chlorpyrifos.
3. The 303(d) listings and TMDLs have been considered in the development of the Order. A pollutant-by-pollutant evaluation of each pollutant of concern is described in section VI.C.3. of this Fact Sheet. The Order requires the Discharger to monitor the effluent and the receiving water for these pollutants.

E. Other Plans, Policies and Regulations

1. The discharge authorized herein and the treatment and storage facilities associated with the discharge of treated municipal wastewater, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, California Code of Regulations (CCR), section 20005 *et seq.* (hereafter Title 27). The exemption, pursuant to Title 27 CCR section 20090(a), is based on the following:
 - a. The waste consists primarily of domestic sewage and treated effluent;
 - b. The waste discharge requirements are consistent with water quality objectives; and

- c. The treatment and storage facilities described herein are associated with a municipal wastewater treatment plant.

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*” for discharges in the Sacramento and San Joaquin Basins 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 Regional 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 Regional 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 Regional 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 or application 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 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.
- 3. Prohibition III.C (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.
- 4. Prohibition III.D (No inclusion of pollutant free wastewater shall cause improper operation of the Facility’s systems).** This prohibition is based on 40 CFR Part 122.41 et seq. that requires the proper design and operation of treatment facilities.

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 authorized by this Order must meet minimum federal technology-based requirements based on Secondary Treatment Standards at 40 CFR Part 133.

Regulations promulgated in 40 CFR 125.3(a)(1) require technology-based effluent limitations for municipal Dischargers to be placed in NPDES permits based on Secondary Treatment Standards or Equivalent to Secondary Treatment Standards.

The Federal Water Pollution Control Act Amendments of 1972 (PL 92-500) established the minimum performance requirements for POTWs [defined in section 304(d)(1)]. Section 301(b)(1)(B) of that Act requires that such treatment works must, as a minimum, meet effluent limitations based on secondary treatment as defined by the USEPA Administrator.

Based on this statutory requirement, USEPA developed secondary treatment regulations, which are specified in 40 CFR Part 133. These technology-based regulations apply to all municipal wastewater treatment plants and identify the minimum level of effluent quality attainable by secondary treatment in terms of 5-day biochemical oxygen demand (BOD₅), total suspended solids (TSS), and pH.

2. Applicable Technology-Based Effluent Limitations

- a. **BOD₅ and TSS.** Federal regulations at 40 CFR Part 133, establish the minimum weekly and monthly average level of effluent quality attainable by secondary treatment for BOD₅ and TSS. BOD₅ is a measure of the amount of oxygen used in the biochemical oxidation of organic matter. The federally required secondary treatment standards for BOD₅ and TSS are defined as meeting an AMEL of 30 mg/L and AWEL of 45 mg/L with a 30-day average removal of 85%. However, WQBELs for BOD₅ and TSS are established in this Order with an AMEL of 10 mg/L, AWEL of 15 mg/L, and maximum daily limit of 30 mg/L to meet numeric objectives and protect beneficial uses. A daily maximum effluent limitation for BOD₅ and TSS is included in the Order to ensure that the treatment works are not organically overloaded and operate in accordance with design capabilities. This Order also contains a limitation requiring an average of 85 percent removal of BOD₅ and TSS over each calendar month, as described in 40 CFR 133.102.
- b. **Flow.** The Facility was designed to provide secondary treatment up to a design average dry weather flow of 2.5 mgd. Therefore, this Order contains an average dry weather discharge flow effluent limit of 2.5 mgd.

- c. **pH.** The secondary treatment regulations at 40 CFR Part 133 also require that pH be maintained between 6.0 and 9.0 standard units. However, to ensure that Basin Plan water quality objectives are met, effluent pH is to be maintained between 6.5 and 8.5, as discussed in the following section.

**Summary of Technology-based Effluent Limitations
 Discharge Point No. EFF-001**

Table F-3. Summary of Technology-based Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
BOD ₅	mg/L	30	45	60	--	--
	lbs/day	626	938	1251	--	--
	% Removal	85	--	--	--	--
TSS	mg/L	30	45	60	--	--
	lbs/day	626	938	1251	--	--
	% Removal	85	--	--	--	--
pH	Standard units	--	--	--	6.0 ¹	9.0 ¹
¹ To meet Basin Plan objectives, this Order contains pH limitations of 6.5 to 8.5 as discussed in the Water Quality Based Effluent Limits section						

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. This Order contains requirements, expressed as a technology equivalence requirement, more stringent than secondary treatment requirements that are necessary to meet applicable water quality standards. The rationale for these requirements, which consist of advanced-secondary treatment or equivalent requirements or other provisions, is discussed in section IV.C.3 of this Fact Sheet.

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.*" for discharges in the Sacramento River and San Joaquin River Basins.

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.** Beneficial uses from Table II-1 of the Basin Plan applicable to Sacramento River (Shasta Dam to Colusa Basin Drain) are as follows:

Table F-4. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
EFF-001	<p align="center">Sacramento River (Shasta Dam to Colusa Basin Drain)</p>	<p>Municipal and domestic supply (MUN); Agricultural supply, including irrigation and stock watering (AGR); Industrial service supply (IND); Hydropower generation (POW); Water contact recreation, including canoeing and rafting (REC-1); Non-contact water recreation (REC-2); Warm freshwater habitat (WARM); Cold freshwater habitat (COLD); Migration of aquatic organisms, warm and cold (MIGR); Spawning, reproduction, and/or early development, warm and cold (SPWN); Wildlife habitat (WILD); and Navigation (NAV).</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 Discharger data from September 2008 through December 2012, which includes effluent and ambient background data submitted in SMRs and the Report of Waste Discharge (ROWD). In addition, Department of Water Resources (DWR) ambient water quality data from two water quality monitoring locations in the Sacramento River, located upstream and downstream of the discharge were evaluated as part of the RPA. The upstream DWR monitoring station, identified as *Sacramento River at Bend Bridge* (A0278500), is located approximately 8 miles upstream of the discharge. The downstream DWR monitoring station, identified as *Sacramento River at Red Bluff Diversion Dam* (A0275500), is located approximately 1 mile downstream of the discharge location. The DWR monitoring stations provided a combination of monthly and quarterly receiving water total and dissolved copper and zinc data and total dissolved and suspended solids data from January 2007 through December 2012. The *Sacramento River at Bend Bridge* monitoring station also provided continuous receiving water flow and turbidity data. ~~The continuous flow and turbidity data, along with the total dissolved and suspended solids data, were used to analyze the Discharger and DWR data sets with respect to peak flows associated with significant storm events, specifically, the validity of the copper and zinc data sets as representative of the ambient receiving water conditions for these two constituents.~~

After completing an analysis of the Discharger and DWR data sets, the DWR data set (*Sacramento River at Bend Bridge*) was selected in lieu of the Discharger data set for purposes of calculating assimilative capacity and setting effluent limits for copper and zinc, as discussed below. Background receiving water total recoverable copper and zinc data collected by DWR at the monitoring

~~station, Sacramento River at Bend Bridge, was used in the RPA and in the development of final WQBELs for copper and zinc.~~

~~–Section 1.2 of the SIP states that the Regional Water Board “shall use all available, valid, relevant, representative data and information, as determined by the Regional Water Board.” Section 1.2 of the SIP also states that the Regional Water Board “shall have the discretion to consider if any data are inappropriate or insufficient for use,” in the reasonable potential analysis. SIP examples where such a consideration is warranted include, but are not limited to, the following: “when evidence exists that a sample has been erroneously reported or is the data may not be representative of effluent or ambient receiving water quality; and/or questionable quality control/quality assurance practices; and varying seasonal conditions.”~~

Available. Both the Discharger and DWR data sets are available to the Regional Water Board through the Discharger’s monitoring reports, and the DWR data compilation website.

Valid. Measurement of total and dissolved metals at low concentrations requires careful and consistent sampling methods. The DWR monitoring stations are professionally managed with quality assurance plans that include quality control procedures. While the DWR quality assurance/quality control (QA/QC) procedures are more rigorous and robust than those of the Discharger, the Discharger does follow established procedures, and staff have been trained in acceptable sample collection procedures. Furthermore, both the DWR data and the Discharger data are based on samples analyzed at California-certified analytical laboratories. Therefore both the Discharger’s data set and the DWR data set ~~could~~ should be considered valid, at least on the basis of QA/QC issues. However, the SIP contains additional guidance on determining the validity of data. Specifically, section 1.4.3.1 of the SIP states that the Regional Water Board “shall have discretion to consider if any samples are **invalid** [emphasis added] for use as applicable data due to evidence that the sample ... is not representative of the ambient receiving water column that will mix with the discharge. For example, the RWQCB shall have discretion to consider samples to be **invalid** [emphasis added] that have been taken during peak flows of significant storm events.” Both the Discharger and DWR data sets include several individual data points for total recoverable concentrations of copper and zinc that exceed the applicable water quality criteria (if the criteria are expressed as a total recoverable concentration). If these data points were determined to be representative of the receiving water quality, then one would conclude that no assimilative capacity exists, and dilution credits would not be available for use in calculating effluent limits for copper and zinc. However, if these data points are determined not to be representative, then it can be concluded that the receiving water does have assimilative capacity for copper and zinc, and dilution credits can be further considered. These data points are spikes in the concentration of total recoverable copper and zinc, meaning the concentrations are well above the rest of the data set. Such spikes in the total recoverable metals concentration

are frequently due to high sediment loads associated with peak storm events. Therefore it is appropriate to determine whether or not the data point should be included in the final data set for further analysis. In order to conduct this evaluation, it is necessary to correlate the timing of the sample collection to a time that high flow, high sediment load, or peak storm events occurred. The DWR data set includes data for flow and total suspended solids that indicate that the data spikes observed in the DWR data set are associated with peak flows and high sediment loads. Therefore those spikes are considered invalid and have been removed from the data set. The Discharger data set, however, does not include receiving water flow or suspended solids data. Therefore, although we suspect that the spikes are due to high sediment loads, we are unable to correlate the spikes to high flow and sediment load, and are unable to determine the validity of the spikes in the Discharger data set.

Relevant. In order for a data set to be relevant, it must relate to the intended use of the data. In this case the data is used to determine if there is assimilative capacity in the receiving water for copper and zinc, and to calculate effluent limits. Both data sets provide data that can be used for this purpose, and therefore both the Discharger's data set and the DWR data set were determined to be relevant.

Representative. In order for a data set to be representative, it must accurately portray the characteristics of interest for the water body being evaluated. The Regional Water Board finds that in this case the DWR data set is representative, but the Discharger's data set is not representative because:

1. Both the Discharger and DWR data sets include several spikes at individual data points for total recoverable concentrations for copper and zinc. As presented in the "validity" discussion above, the lack of corresponding flow and total suspended solids data in the Discharger's data set makes it impossible to determine if the spikes in the Discharger's data set are due to peak flow events and suspended solids in the water column, and whether or not they should be included for further analysis. Therefore, although Regional Water Board staff suspect that the spikes in the Discharger's data set are due to elevated solids from peak flow events, there is insufficient information to screen the spikes out. On the other hand, the DWR data set does include data for flow and total suspended solids that indicate the spikes in the DWR data set are due to peak flow events and suspended solids in the water column. Therefore the spikes in the DWR data set have been determined to not be representative of the receiving water for the purposes of determining assimilative capacity and calculating effluent limit for copper and zinc, and were removed for the remainder of the analysis.

2. The applicable copper and zinc water quality criteria for protection of aquatic life are expressed as a dissolved concentration because it is the dissolved metal that is toxic to aquatic life, not the portion of the metal adsorbed onto suspended solids particles. Therefore, the aquatic life beneficial use is protected if the dissolved criteria are not exceeded in the receiving water. The DWR data set includes both total and dissolved data for copper and zinc and shows that the dissolved concentration of copper and zinc in the receiving water has not exceeded the dissolved criteria. The Discharger’s data set does not include dissolved concentrations and therefore cannot be directly compared to the applicable water quality criteria.

3. As discussed previously, DWR maintains water quality monitoring stations both above and below the discharge location in the receiving water. Both the upstream and downstream data sets for copper and zinc show that the dissolved concentrations of copper and zinc do not exceed the applicable water quality criteria, even allowing for any copper and zinc added to the receiving water by the discharge. This results in the conclusion that assimilative capacity for copper and zinc does exist in the receiving water. If the Regional Water Board was required to rely on the Discharger’s copper and zinc data (total recoverable) it would have to conclude that assimilative capacity does not exist in the receiving water—an illogical (and unnecessary) conclusion clearly not supported by consideration of the upstream and downstream DWR data.

4. The DWR data set exhibits a low variance (<1) and low standard deviation, whereas the Discharger’s receiving water copper and zinc data had a relatively high variance and standard deviation, as shown in the following table. This is further evidence of the relative quality of the DWR data sets.

Table F-5. Comparison of Receiving Water Data from Discharger and DWR

<u>Station ID</u>	<u>Date Range</u>	<u>Sample Count</u>	<u>Min. Conc.</u>	<u>Max. Conc.</u>	<u>Avg.</u>	<u>Median</u>	<u>Std. Dev.</u>	<u>CV</u>
<u>COPPER (µg/L)</u>								
<u>DWR (Upstream)</u>	<u>Jan. 2007 – Dec. 2012</u>	<u>29</u>	<u>0.7</u>	<u>3.19</u>	<u>1.6</u>	<u>1.33</u>	<u>0.7</u>	<u>0.43</u>
<u>Discharger (R-1)</u>	<u>Mar. 2009 – Dec. 2012</u>	<u>46</u>	<u>1.0</u>	<u>18.5</u>	<u>2.98</u>	<u>2.05</u>	<u>2.95</u>	<u>1.0</u>
<u>DWR (Downstream)</u>	<u>Jan. 2007 – Oct. 2009¹</u>	<u>23</u>	<u>0.82</u>	<u>3.88</u>	<u>1.65</u>	<u>1.5</u>	<u>0.72</u>	<u>.44</u>
<u>ZINC (µg/L)</u>								
<u>DWR (Upstream)</u>	<u>Jan. 2007 – Dec. 2012</u>	<u>29</u>	<u>1.4</u>	<u>7.79</u>	<u>3.84</u>	<u>3.7</u>	<u>1.6</u>	<u>0.41</u>
<u>Discharger (R-1)</u>	<u>Mar. 2009 – Dec. 2012</u>	<u>48</u>	<u>1.9</u>	<u>45.1</u>	<u>7.4</u>	<u>4.55</u>	<u>8.8</u>	<u>1.2</u>
<u>DWR (Downstream)</u>	<u>Jan. 2007 – Oct. 2009¹</u>	<u>23</u>	<u>2.22</u>	<u>6.85</u>	<u>3.48</u>	<u>3.12</u>	<u>1.12</u>	<u>.32</u>

1 Copper and zinc data from DWR station, Sacramento River at Red Bluff Diversion Dam, unavailable after October 2009.

Therefore, for the reasons discussed above, the Regional Water Board has exercised its discretion and has used the DWR data set in lieu of the Discharger’s data set for the determination of assimilative capacity and setting effluent limits for copper and zinc.

Separate from the analysis conducted for copper and zinc, the Discharger’s effluent data for ammonia was evaluated. This resulted in ~~in addition,~~ effluent ammonia data collected prior to January 2010 was not being included in the reasonable potential analysis for the following reasons. During the term of the past permit cycle the Discharger retained a contract operator to operate the Facility. Effluent ammonia concentrations significantly decreased after the change in operator which may be attributed to a change in operation at the Facility. Effluent ammonia data collected before and after the change in operator at the Facility are provided in the table below.

Effluent Ammonia (mg/L)	Pre-Change in Operator 2007 - 2009	Post-Change in Operator 2010 - 2012
Sample Count	37	35
Minimum	0.1	0.04
Maximum	17.7	3.45
Average	2.4	0.45
Median	0.9	0.1
Standard Deviation	3.4	0.8
Coefficient of Variation	1.4	1.9

Section 1.2 of the SIP states the Regional Water Board has the discretion to consider if any data are inappropriate or insufficient for use in the reasonable potential analysis. Examples where such a consideration is warranted include, but are not limited to, when evidence exists that the data may not be representative of the effluent quality and/or a change in operation at the Facility may have affected the quality of the effluent. For these reasons the Central Valley Water Board finds the effluent ammonia data collected prior to the change in operator to be not representative of current Facility performance with respect to effluent ammonia concentrations. Therefore, the Central Valley Water Board finds the effluent ammonia date range of January 2010 through December 2012 to be sufficient and adequate to use in the reasonable potential analysis.

b.c. Assimilative Capacity/Mixing Zone.

- i. **Regulatory Guidance for Dilution Credits and Mixing Zones.** The Discharger has requested mixing zones and dilution credits for compliance with aquatic-life and human health water quality criteria. The Central Valley Water Board has discretion to accept or deny mixing zones and dilution credits. The CWA directs states to adopt water quality standards to protect the quality of its waters. USEPA’s current water quality standards regulation

authorizes states to adopt general policies, such as mixing zones, to implement state water quality standards (40 CFR section 122.44 and section 122.45). The USEPA allows states to have broad flexibility in designing its mixing zone policies. Primary policy and guidance on determining mixing zone and dilution credits is provided by the SIP and the Basin Plan. If no procedure applies in the SIP or the Basin Plan, then the Central Valley Water Board may use the USEPA Technical Support Document for Water Quality-Based Toxics Control (EPA/505/2-90-001) (TSD).

The TSD defines a mixing zone as follows, “...a mixing zone is an area where an effluent discharge undergoes initial dilution and is extended to cover the secondary mixing in the ambient water body. A mixing zone is an allocated impact zone where water quality criteria can be exceeded as long as acutely toxic conditions are prevented.” The SIP provides guidance on mixing zones and dilution credits in establishing water quality-based effluent limitations. Water quality criteria and objectives must be met throughout a water body except within a mixing zone. All mixing zones shall be as small as practicable and must meet specific conditions.

The allowance of mixing zones by the Central Valley Water Board is discretionary and can be granted parameter-by-parameter and/or type of criteria (e.g., acute or chronic aquatic life criteria). The allowance of mixing zones by the Central Valley Water Board is discussed in the Basin Plan, Policy for Application of Water Quality Objectives, which states in part, “In conjunction with the issuance of NPDES and storm water permits, the Regional Board may designate mixing zones within which water quality objectives will not apply provided the discharger has demonstrated to the satisfaction of the Regional Board that the mixing zone will not adversely impact beneficial uses. If allowed, different mixing zones may be designated for different types of objectives, including, but not limited to, acute aquatic life objectives, chronic aquatic life objectives, human health objectives, and acute and chronic whole effluent toxicity objectives, depending in part on the averaging period over which the objectives apply. In determining the size of such mixing zones, the Regional Board will consider the applicable procedures and guidelines in the EPA’s Water Quality Standards Handbook and the [TSD]. Pursuant to EPA guidelines, mixing zones designated for acute aquatic life objectives will generally be limited to a small zone of initial dilution in the immediate vicinity of the discharge.”

For Priority Pollutants, the SIP supersedes the Basin Plan mixing zone provisions. Section 1.4.2 of the SIP states, in part, “...with the exception of effluent limitations derived from TMDLs, in establishing and determining compliance with effluent limitations for applicable human health, acute aquatic life, or chronic aquatic life priority pollutant criteria/objectives or the toxicity objective for aquatic life protection in a basin plan, the Regional Board may grant mixing zones and dilution credits to dischargers...The applicable priority pollutant criteria and objectives are to be met through a water body except within any mixing zone granted by the Regional Board. **The allowance of**

mixing zones is discretionary and shall be determined on a discharge-by-discharge basis. *The Regional Board may consider allowing mixing zones and dilution credits only for discharges with a physically identifiable point of discharge that is regulated through an NPDES permit issued by the Regional Board.”*

For completely-mixed discharges, the Central Valley Water Board may grant a mixing zone and apply a dilution credit in accordance with Section 1.4.2.1 of the SIP. For incompletely-mixed discharges, the Discharger must complete an independent mixing zone study to demonstrate to the Central Valley Water Board that a dilution credit is appropriate. In granting a mixing zone, Section 1.4.2.2 of the SIP requires the following to be met:

“A mixing zone shall be as small as practicable. *The following conditions must be met in allowing a mixing zone: [emphasis added]*

A: A mixing zone shall not:

1. *compromise the integrity of the entire water body;*
2. *cause acutely toxic conditions to aquatic life passing through the mixing zone;*
3. *restrict the passage of aquatic life;*
4. *adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws;*
5. *produce undesirable or nuisance aquatic life;*
6. *result in floating debris, oil, or scum;*
7. *produce objectionable color, odor, taste, or turbidity;*
8. *cause objectionable bottom deposits;*
9. *cause nuisance;*
10. *dominate the receiving water body or overlap a mixing zone from different outfalls; or*
11. *be allowed at or near any drinking water intake. A mixing zone is not a source of drinking water. To the extent of any conflict between this determination and the Sources of Drinking Water Policy (Resolution No. 88-63), this SIP supersedes the provisions of that policy.”*

Section 1.4.2.1 of the SIP establishes the authority for the Central Valley Water Board to consider dilution credits based on the mixing zone conditions in a receiving water. Section 1.4.2.1 in part states:

*“The dilution credit, D , is a numerical value associated with the mixing zone that accounts for the receiving water entrained into the discharge. The dilution credit is a value used in the calculation of effluent limitations (described in Section 1.4). **Dilution credits may be limited or denied on a pollutant-by-pollutant basis, which may result in a dilution credit for all, some, or no priority pollutants in the discharge.**”*

The mixing zone is thus an administrative construct defined as an area around the outfall that may exceed water quality objectives, but is otherwise protective of the beneficial uses. Dilution is defined as the amount of mixing that has occurred at the edge of this mixing zone under critical conditions, thus protecting the beneficial uses at the concentration and for the duration and frequency required.

- ii. **Dilution/Mixing Zone from Order R5-2007-0041.** Order R5-2007-0041 granted dilution credits for copper, zinc, chlorodibromomethane, and dichlorobromomethane. The dilution credits were based on the results of a 2006 Mixing Zone Study performed by the Discharger. The Study used the modeling software CORMIX to determine mixing zone dimensions and dilution factors. The resulting “effective” dilution credit granted in Order R5-2007-0041 for all of the subject constituents was 29:1. Since the time of the 2006 Study, the operation of the Red Bluff Diversion Dam, located approximately 1 mile downstream of the discharge, has been modified such that its new operation¹ affects the receiving water conditions at the Facility outfall. In order to account for the change in receiving water conditions as a result of the operational modification and to also account for a decrease in minimum receiving water flows in recent years, the Discharger updated the Mixing Zone Study in February 2012.
- iii. **Sacramento River and Facility Effluent Flows.** Flows in the Sacramento River are largely dependent on releases from upstream reservoirs, which are operated to meet various needs, such as flood control, water supply and storage, and aquatic habitat. These operations may result in minimum receiving water flows occurring during peak wet weather effluent flows at the Facility. Flows in the Sacramento River are recorded at the Bend Bridge USGS Monitoring Station (#11377100) near Red Bluff. The 2012 Mixing Zone Study presented the following critical flows for the receiving water and the effluent:

Receiving Water Flow (cfs)	Discharge Effluent Flows (mgd) (2007 - 2011)
4,220 (1Q10)	2.96 (Max daily)
4,280 (7Q10)	2.44 (Max 4-day)
9,120 (Harmonic Mean)	1.26 (Average)

- iv. **Outfall Configuration.** The Facility effluent outfall consists of a 30-inch-diameter concrete coated steel pipe entering from the right bank (looking downstream) of the receiving water adjacent to the Facility. The end of the line is an open-ended (i.e., no diffuser or nozzle) 30-inch discharge oriented horizontally and approximately perpendicular to the river flow. The river

¹ The Red Bluff Diversion Dam gates are no longer seasonally closed in order to divert by gravity irrigation water to the Corning and Tehama-Colusa Canal. As of 15 September 2011 the gates are now permanently fully open. This action has eliminated the seasonal lake created by the dam and as a result, the upstream water surface elevation of the river at the Facility’s discharge location is at a lower, year-round level.

channel width at the outfall location is not less than 377 feet at the lowest (1Q10) receiving water flow condition.

- v. **Dilution/Mixing Zone Study Results.** The Discharger’s 2012 Mixing Zone Study relied on CORMIX to model the mixing zone dimensions and dilution factors. The Study utilized the critical receiving water flows, as presented above, and paired these values with projected critical effluent flows based on calculated peaking factors. The effluent flows used in the Study were as follows:

Criterion	Projected Critical Effluent Flows (mgd)
Acute aquatic-life	5.87 (Max daily)
Chronic aquatic-life	4.70 (Max 4-day)
Human Health	2.50 (Average)

The 2012 Study determined that the discharge does not meet the conditions of a *completely-mixed* discharge, and that the discharge is an *incompletely-mixed* discharge. The distances downstream of the outfall, at which the discharge is completely mixed with the receiving water, for each criterion, are provided in the table below:

Criterion	Completely-Mixed Dilution	Distance to Complete Mix
Acute aquatic-life	465:1	14 miles
Chronic aquatic-life	588:1	15 miles
Human Health	2,358:1	20 miles

The 2012 Study presented dilution credits for each criterion condition (acute aquatic-life, chronic aquatic-life, and human-health) at one distance (164 feet) downstream of the discharge. The distance of 164 feet is the length of the acute mixing zone established in Order R5-2007-0041. The table below provides the 2012 Mixing Zone Study results:

Table F-6. Mixing Zone/Dilution Model Results

Condition	Distance Downstream	Width	Dilution Factor
Acute	164 ft.	17 ft.	20
Chronic	164 ft.	17 ft.	25
Human Health	164 ft.	17 ft.	91

The 2012 Study concluded that the available dilution is less than what was presented in the 2006 Study because (1) effluent flows have increased (peaking factors are larger than what was presented in the 2006 Study), (2) critical river flow determined from USGS records have decreased, and (3) the lower water surface elevation with the downstream diversion gates open reduces the ambient water available for dilution. The results shown above in Table F-6 demonstrate that the dilution credit associated with the previous Order’s mixing zone of 164 feet is now reduced as a result of these factors.

vi. **Evaluation of Available Dilution for Specific Constituents (Pollutant-by-Pollutant Evaluation).** When determining appropriate dilution credits for a specific pollutant, several factors must be considered, such as, available assimilative capacity, facility performance, and the resulting mixing zone size. The following table summarizes statistical information for each parameter under consideration for dilution credits and includes projected maximum effluent concentrations. Average monthly effluent limitations (AMELs) and maximum daily effluent limitations (MDEL) for each parameter, calculated with no dilution credit, have been provided for the purpose of comparison to the projected maximum effluent concentration. [As discussed in (ii) above, Order No. R5-2007-0041 established water quality-based effluent limitations using dilution credits for the same parameters listed in the table below, with the exception of ammonia].

Table F-7. Effluent Data and Projected Maximum Effluent Concentrations

Parameter	CDBM	Copper	DCBM	Zinc	Ammonia
Date Range	Sept.08- Dec.12	Sept.08- Dec.12	Sept.08- Dec.12	Sept.08- Dec.12	Jan.10- Dec.12
Sample Count	52	54	55	61	35
Units	µg/L	µg/L	µg/L	µg/L	mg/L
Minimum	<0.01	2.6	<0.1	9.4	0.04
Maximum	2.0	30.4	13.0	249	3.45
Mean	0.5	5.7	3.5	65.1	0.45
Median	0.40	4.9	2.9	57.1	0.1
Standard Deviation	0.41	3.9	2.9	37.6	0.84
Coefficient of Variation	0.83	0.67	0.82	0.58	1.9
Projected Maximum Effluent Concentration¹	[2.0]	[30.4]	13.2	[249]	[3.45]
No Dilution Effluent Limits	AMEL: 0.41 MDEL: 0.95	AMEL: 6.68 MDEL: 14.1	AMEL: 0.56 MDEL: 1.30	AMEL: 18.6 MDEL: 36.7	AMEL: 0.43 MDEL: 2.14

Metals are expressed as total recoverable.

CDBM: Chlorodibromomethane, DCBM: Dichlorobromomethane.

¹ Based on normally distributed data where 99.9% of the data will lie within 3.3 standard deviations of the mean (when there are ten sampling data points or more). If the maximum observed effluent concentration (MEC) was greater, then the MEC is listed in brackets [].

Data source: ROWD.

Based on existing effluent data, it appears the Facility cannot meet the end-of-pipe (no dilution) water quality-based effluent limitations (WQBELs) for chlorodibromomethane, copper, dichlorobromomethane, zinc, and ammonia. As discussed in Fact Sheet section IV.C.3, assimilative capacity is available in the receiving water for these parameters.

The Central Valley Water Board considered the projected maximum effluent concentration and the receiving water’s assimilative capacity for each individual pollutant in the determination of appropriately sized mixing zones. The consideration of these factors is necessary to avoid allocating an unnecessarily large portion of the receiving water’s assimilative capacity for each pollutant and possibly violate the Antidegradation Policy. Table F-8 below summarizes the dilution credits and associated mixing

zones that have been evaluated for each parameter. The numeric value of these dilution credits were developed to minimize the size of the mixing zone while taking into consideration the projected maximum effluent concentration and the assimilative capacity of the receiving water for each pollutant. The projected maximum effluent concentration for each parameter, provided in Table F-7 above, has been repeated in Table F-8 for comparison to the resulting effluent limitations based on the dilution credits provided.

Table F-8. Dilution Credits and Resulting Effluent Limits Comparison

Parameter	Dilution Credit	Mixing Zone (distance downstream)	Resulting AMEL ¹ (µg/L)	Resulting MDEL ¹ (µg/L)	Projected Maximum Effluent Concentration
CDBM (µg/L)	8:1 (Human Health)	14 ft.	3.1	7.3	2.0
Copper (µg/L)	18:1 (Acute) 22:1 (Chronic)	148 ft. (Acute) 144 ft. (Chronic)	34.0	71.8	30.4
DCBM (µg/L)	34:1 (Human Health)	61 ft.	14.5	33.6	13.2
Zinc (µg/L)	51:1 (Acute) 4:1 (Chronic)	600 ft. (Acute) 26 ft. (Chronic)	275.4	543.9	249
Ammonia (mg/L)	8:1 (Acute) 3:1 (Chronic)	66 ft. (Acute) 20 ft. (Chronic)	3.8	19.3	3.45

¹ AMEL: Average Monthly Effluent Limit, MDEL: Monthly Average Effluent Limit

Section 1.4.2.2 of the SIP provides specific conditions for mixing zones and those conditions are discussed in further detail in (vii) below.

- vii. Evaluation of Available Dilution for Applicable Water Quality Criteria.** The Discharger has requested acute and chronic aquatic-life mixing zones for compliance with acute and chronic water quality criteria/objectives for copper, zinc, and ammonia. The Discharger has also requested a human health mixing zone for compliance with human health water quality criteria for chlorodibromomethane and dichlorobromomethane. Based on the results of the Mixing Zone/Dilution Study, the largest acute aquatic-life mixing zone under evaluation is approximately 600 feet and the largest chronic aquatic-life mixing zone is approximately 144 feet (see Table F-8 above). The largest human health criteria mixing zone is approximately 61 feet.

The acute and chronic aquatic-life mixing zones of 600 feet and 144 feet, respectively, and the human health mixing zone of 61 feet downstream of the diffuser meet the requirements of the SIP as follows:

- (1) Shall not compromise the integrity of the entire water body** – The TSD states that, “If the total area affected by elevated concentrations within all mixing zones combined is small compared to the total area of a waterbody (such as a river segment), then mixing zone are likely to have little effect on the integrity of the waterbody as a whole, provided that the mixing zone does not impinge on unique or critical habitats.”

The receiving water surface width at the outfall is approximately 377 feet during the lowest receiving water flow conditions. The largest aquatic-life mixing zone of 600 feet is approximately 33 feet wide at the furthest downstream edge of the mixing zone. The human health mixing zone is not applicable to aquatic life criteria. The human health mixing zone does not compromise the integrity of the entire waterbody.

- (2) *Shall not cause acutely toxic conditions to aquatic life passing through the mixing zone* - The mixing zone does not allow acute aquatic-life criteria to be exceeded and this Order requires acute bioassays to be conducted using 100% effluent. Compliance with these requirements ensures that acutely toxic conditions to aquatic life passing through the chronic mixing zone do not occur. The current discharge has not been shown to result in acute or chronic toxic conditions.
- (3) *Shall not restrict the passage of aquatic life* - The size of the zone of passage varies on either side of the river depending on the river geometry. The width of the river at the outfall is approximately 377 feet at the water surface. At 600 feet downstream, the mixing zone is approximately 33 feet in width, which provides a cross section of over 340 feet for fish to pass.
- (4) *Shall not adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws* -The acute mixing zone will not cause acutely toxic conditions, allows adequate zone of passage, and is sized appropriately to ensure that there will be no adverse impacts to biologically sensitive or critical habitats.
- (5) *Shall not produce undesirable or nuisance aquatic life; result in floating debris, oil, or scum; produce objectionable color, odor, taste, or turbidity; cause objectionable bottom deposits, cause nuisance* -The current discharge has not been shown to result in floating debris, oil, or scum; produce objectionable color, odor, taste, or turbidity; cause objectionable bottom deposits; or cause nuisance.
- (6) *Shall not dominate the receiving water body or overlap a mixing zone from different outfalls.* – The acute mixing zone is small relative to the water body, so it will not dominate the water body. The mixing zone does not overlap with mixing zones from other outfalls. There are no outfalls or mixing zones within the vicinity of the discharge.
- (7) *Shall not be allowed at or near any drinking water intake. A mixing zone is not a source of drinking water. To the extent of any conflict between this determination and the Sources of Drinking Water Policy (Resolution No. 88-63), this SIP supersedes the provisions of that policy.*” – The drinking water supply for the City of Red Bluff is entirely

groundwater. No other known drinking water intakes are near the mixing zone.

viii. Final Dilution Credits – The final dilution credits and associated mixing zones lengths for each pollutant receiving dilution credit(s) are summarized below in Table F-9. The dilution credits allowed in this Order are in accordance with Section 1.4.2.2 of the SIP and are a discretionary act by the Central Valley Water Board.

Table F-9. Final Dilution Credits

Pollutant	Units	Dilution Credit			Mixing Zone/ Distance Downstream (ft.)		
		Acute	Chronic	Human Health	Acute	Chronic	Human Health
CDBM	µg/L	--	--	8	--	--	14
Copper	µg/L	18	22	--	148	144	--
DCBM	µg/L	--	--	34	--	--	61
Zinc	µg/L	51	4	--	600	26	--
Ammonia	mg/L	8	3	--	66	26	--

CDBM: Chlorodibromomethane, DCBM: Dichlorobromomethane

The distance downstream of the mixing zones have been estimated using a linear interpolation of the dilution credits provided in the Mixing Zone Study. The widths of all of the human health mixing zones are estimated as less than 33 feet.

ix. Regulatory Compliance for Dilution Credits and Mixing Zones. To fully comply with all applicable laws, regulations and policies of the State, Central Valley Water Board approved a mixing zone and the associated dilution credits shown in Table F-9 based on the following:

- Mixing zones are allowed under the SIP provided all elements contained in Section 1.4.2.2 are met. Based on the mixing zone study conducted by the Discharger the Central Valley Water Board has determined that these factors are met.
- Section 1.4.2.2 of the SIP requires mixing zones to be as small as practicable. Based on the mixing zone study conducted by the Discharger the Central Valley Water Board has determined the mixing zone is as small as practicable.
- In accordance with Section 1.4.2.2 of the SIP, the Board has determined the mixing zone is as small as practicable, will not compromise the integrity of the entire water body, restrict the passage of aquatic life, dominate the water body or overlap existing mixing zones from different outfalls. The mixing zones are small relative to the large size of the receiving water, are not at or near a drinking water intake, and do not overlap a mixing zone from a different outfall.

- As required by the SIP, in determining the extent of or whether to allow a mixing zone and dilution credit, the Central Valley Water Board has considered the presence of pollutants in the discharge that are carcinogenic, mutagenic, teratogenic, persistent, bioaccumulative, or attractive to aquatic organisms, and concluded that the allowance of the mixing zone and dilution credit is adequately protective of the beneficial uses of the receiving water.
- The Central Valley Water Board has determined mixing zone complies with the SIP for priority pollutants.
- The Central Valley Water Board has determined the mixing zone complies with the Basin Plan for non-priority pollutants. The Basin Plan requires a mixing zone not adversely impact beneficial uses. Beneficial uses will not be adversely affected for the same reasons discussed above. In determining the size of the mixing zone, the Central Valley Water Board has considered the procedures and guidelines in Section 5.1 of USEPA's *Water Quality Standards Handbook, 2nd Edition* (updated July 2007) and Section 2.2.2 of the TSD. The SIP incorporates the same guidelines.
- The Central Valley Water Board has determined that allowing dilution factors that exceed those proposed by this Order would not comply with the State Anti-degradation Policy for receiving waters outside the allowable mixing zone for copper, zinc, ammonia, chlorodibromomethane, and dichlorobromomethane. 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 and requires that existing quality of waters be maintained unless degradation is justified based on specific findings. Item 2 of Resolution 68-16 states:

“Any activity which produces or may produce a waste or increased volume or concentration of waste and which dischargers or proposed to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.”

If the facility performance, treatment or characteristics of the discharge or receiving water should change this Order provides a reopener to allow the Board to reconsider and revise the dilution factors granted, including increasing the allowed dilution credit if necessary.

The final effluent limitations for chlorodibromomethane, copper, dichlorobromomethane, zinc, and ammonia were developed using the Facility's past performance as the Discharger's current wastewater treatment capability. Therefore, the Central Valley Water Board determined

the effluent limitations required by this Order will result in the Discharger implementing best practicable treatment or control of the discharge necessary to assure that pollution or nuisance will not occur and the highest water quality consistent with maximum benefit to the people of the State will be maintained. The Central Valley Water Board also determined the Discharger will be in immediate compliance with the effluent limitations.

The Central Valley Water Board also determined establishing effluent limitations for copper, zinc, ammonia, chlorodibromomethane, and dichlorobromomethane is consistent with Section 1.4.2.2B of the SIP that requires the Central Valley Water Board to deny or significantly limit a mixing zone and dilution credits as necessary to comply with other regulatory requirements.

- Therefore, the Central Valley Water Board has determined the effluent limitations established in the Order for chlorodibromomethane, copper, dichlorobromomethane, zinc, and ammonia are appropriate and necessary to comply with the Basin Plan, SIP, federal anti-degradation regulations, and State Board Resolution 68-16.

b.d. 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 conversions factors contained in Appendix 3 of the SIP were used to convert the applicable criteria to total recoverable criteria.

e. 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 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), Table 4, note 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

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.

for calculating criteria can be the downstream receiving water hardness, after mixing with the effluent (Order WQO 2008-0008, p. 11). The Regional Water Board thus has considerable discretion in determining ambient hardness (*Id.*, p.10.).

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 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. **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 water quality-based effluent limitations (WQBELs) if the MEC is equal to or 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 of 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

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.

reasonable worst-case downstream ambient hardness is outlined in subsection ii, below.

- b) The SIP requires WQBELs 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 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 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 CTR⁴, is as follows:

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

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 WQBELs in accordance with Section 1.4 of the SIP.

⁴ 40 CFR § 131.38(b)(2).

H = hardness (as CaCO_3)
 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:

$ECA = C + D(C-B); \text{ when } C > B$	(Equation 2)
$ECA = C ; \text{ when } C \leq B$	(Equation 3)

Where:

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

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

for Concave Down Metals, where no dilution credit has been granted, the CTR criteria have been calculated using the downstream ambient hardness under this condition. For Concave Down Metals, where a dilution credit *has* been granted (e.g., copper and zinc), the criteria have been calculated using the hardness at the edge of the allocated mixing zone.

Concave Down Metals – No Dilution Credit. The effluent hardness ranged from 106 mg/L to 140 mg/L (as CaCO₃), based on 3 samples from March 2009 to October 2011. The upstream receiving water hardness varied from 44 mg/L to 94 mg/L (as CaCO₃), based on 31 samples from to March 2009 to October 2011. Using a hardness of 106 mg/L (as CaCO₃) to calculate the ECA for all Concave Down Metals will result in water quality-based effluent limitations that are protective under all potential effluent/receiving water mixing scenarios and under all known hardness conditions, as demonstrated in the example using copper shown in Table F-10, below. This example assumes the following conservative conditions for the upstream receiving water:

- Upstream receiving water always at the lowest observed upstream receiving water hardness (i.e., 44 mg/L as CaCO₃);
- Upstream receiving water copper concentration always at the CTR criteria (i.e., no assimilative capacity).

Using these reasonable worst-case conditions, the discharge can be mixed with the receiving water and a resulting downstream mixed hardness (or metals concentration) can be calculated for all discharge and mixing conditions (e.g., 0% effluent to 100% effluent) based on a simple mass balance as shown in Equation 3, below. By evaluating all discharge conditions the reasonable worst-case downstream hardness can be determined for adjusting the CTR criteria.

$C_{MIX} = C_{RW} \times (1 - EF) + C_{Eff} \times (EF)$	(Equation 4)
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Where:

- C_{MIX} = Mixed concentration (e.g. metals or hardness)
- C_{RW} = Upstream receiving water concentration
- C_{Eff} = Effluent concentration
- EF = Effluent Fraction

Using a hardness of 106 mg/L (as CaCO₃) to calculate the ECA for Concave-Down Metals ensures the discharge is protective under all discharge and mixing conditions. In this example, the effluent is in compliance with the CTR criteria and any mixture of the effluent and receiving water is in compliance

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.

with the CTR criteria. An ECA based on a lower hardness (e.g. lowest upstream receiving water hardness) would also be protective, but would result in unreasonably stringent effluent limits considering the known conditions. Therefore, in this Order the ECA for all Concave-Down Metals with no dilution credits has been calculated using Equation 1 with a hardness of 106 mg/L (as CaCO₃).

Table F-10. Copper ECA Evaluation (No Dilution Credit)

		Lowest Observed Effluent Hardness			106 mg/L (as CaCO₃)
		Lowest Observed Upstream Receiving Water Hardness			44 mg/L (as CaCO₃)
		Highest Assumed Upstream Receiving Water Copper Concentration			4.6 µg/L¹
		Copper ECA_{chronic}²			9.8 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%	44.6	4.68	4.68	Yes
	5%	47.1	4.90	4.88	Yes
	15%	53.3	5.45	5.40	Yes
	25%	59.5	5.99	5.92	Yes
	50%	75.0	7.30	7.22	Yes
	75%	90.5	8.57	8.51	Yes
	100%	106.0	9.81	9.81	Yes

- ¹ Highest assumed upstream receiving water copper concentration calculated using Equation 1 for chronic criterion at a hardness of **44 mg/L**.
- ² ECA calculated using Equation 1 for chronic criterion at a hardness of **106 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).

Concave Down Metals- Dilution Credit Allowed In this site-specific case and as discussed in Section IV.C.2.c, above, dilution credits for copper and zinc have been allowed in the calculation of water quality-based effluent limits for these hardness-dependent criteria parameters. As discussed in Section IV.C.2.c., above, the allowed copper dilution credit for acute aquatic life criteria is 18, which represents an effluent fraction of 5.3%, while the dilution credit for copper chronic aquatic life criteria is 22, representing an effluent fraction of 4.3%. The allowed zinc dilution credit for acute aquatic life criteria is 51, which represents an effluent fraction of 1.9%, while the dilution credit for zinc chronic aquatic life criteria is 4, representing an effluent fraction of 20%. These values define the points in the receiving water (i.e., edge of mixing zone) that must be in compliance with aquatic life criteria. The effluent hardness ranged from 106 mg/L to 140 mg/L (as CaCO₃). While the

upstream receiving water hardness varied from 44 mg/L to 94 mg/L (as CaCO₃). When the effluent and receiving water are at their respective minimum observed hardness values (i.e., 106 mg/L and 44 mg/L as CaCO₃, respectively), and the effluent fraction is 5.3%, the mixed hardness is 47.3 mg/L (as CaCO₃). Therefore, a hardness of 47.3 mg/L (as CaCO₃) has been used in this Order for calculating hardness-dependent copper acute criteria. Similarly, a hardness of 46.7 mg/L (as CaCO₃) has been used for calculating hardness-dependent copper chronic criteria.

Similarly for zinc, when the effluent and receiving water are at their respective minimum observed hardness values and the effluent fraction is 1.9%, the mixed hardness is 45.2 mg/L (as CaCO₃). Therefore, a hardness of 45.2 mg/L (as CaCO₃) has been used in this Order for calculating hardness-dependent zinc acute criteria. Similarly, a hardness of 56.4 mg/L (as CaCO₃) has been used for calculating hardness-dependent zinc chronic criteria. Using the ambient hardness to calculate the hardness-dependent metals criteria is consistent with the CTR and the SIP.

Table F-11, below, is an example demonstrating that protective effluent limitations result when using this approach for determining the appropriate hardness. In this example the mixed receiving water copper concentration does not exceed the mixed CTR criteria for copper. The same approach was used for calculating the effluent limitations for zinc.

Table F-11. Copper Hardness Evaluation (Dilution Credit present)

Hardness		46.7 mg/L (as CaCO₃)	
CTR Copper Chronic Criterion		4.9 µg/L	
Dilution Credit		22	
Maximum Background Copper		3.19 µg/L	
Acute Effluent Concentration Allowance (ECA) for Copper¹		42.5 µg/L	
Effluent Fraction	Mixed Downstream Ambient Concentration		
	Hardness² (mg/L) (as CaCO₃)	Criteria³ (µg/L)	Copper⁴ (µg/L)
1%	44.6	4.7	3.6
2%	45.2	4.7	4.0
3%	45.9	4.8	4.4
4%	46.5	4.9	4.8
4.3%	46.7	4.9	4.9

¹ Effluent Concentration Allowance calculated per Section 1.4 of the SIP.

² Mixed downstream ambient hardness is the mixture of the receiving water and effluent hardness using the lowest observed hardness values (i.e., 44 mg/L and 106 mg/L for the receiving water and effluent, respectively)

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 conditions (see Equation 5, below).

The ECA, as calculated using Equation 5, 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 5 is not used in place of the CTR equation (Equation 1). Rather, Equation 5, 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.

$ECA = \left[\frac{m(H_e - H_{rw})(e^{m(\ln(H_{rw})) + b})}{H_{rw}} \right] e^{-m(\ln(H_{rw})) - b} \quad \text{(Equation 5)}$

Where:

- m, b = criterion specific constants (from CTR)
 - H_e = minimum observed effluent hardness
 - H_{rw} = minimum observed upstream receiving water hardness when the minimum effluent hardness is always greater than observed upstream receiving water hardness ($H_{rw} < H_e$)
- or-
- maximum observed upstream receiving water hardness when the minimum effluent hardness is always less than observed upstream receiving water hardness ($H_{rw} > H_e$)¹

A similar example as was done for the Concave Down Metals is shown for lead, a Concave Up Metal, in Table F-12, below. As previously mentioned, the minimum effluent hardness is 106 mg/L (as CaCO₃), while the upstream receiving water hardness ranged from 44 mg/L to 94 mg/L (as CaCO₃). In

¹ When the minimum effluent hardness falls within the range of observed receiving water hardness concentrations, Equation 3 is used to calculate two ECAs, one based on the minimum observed upstream receiving water hardness and one based on the maximum observed upstream receiving water hardness. The minimum of the two calculated ECAs represents the ECA that ensures any mixture of effluent and receiving water is in compliance with the CTR criteria.

this case, the minimum effluent concentration is greater than the range of observed upstream receiving water hardness concentrations. Thus, the ECA was calculated (Equation 4) based on the minimum observed upstream receiving water hardness, no receiving water assimilative capacity for lead (i.e., ambient background lead concentration is at the CTR chronic criterion) and the minimum effluent hardness.

Using Equation 5 to calculate the ECA for all Concave Up Metals will result in water quality-based effluent limitations that are protective under all potential effluent/receiving water mixing scenarios and under all known hardness conditions. Under this condition, the effluent is in compliance with the CTR criteria and any mixture of the effluent and receiving water is in compliance with the CTR criteria. Use of a lower ECA (e.g., calculated based solely on the lowest upstream receiving water hardness) is also protective, but would lead to unreasonably stringent effluent limits considering the known conditions. Therefore, Equation 5 has been used to calculate the ECA for all Concave Up Metals in this Order.

Table F-12. Lead ECA Evaluation

		Lowest Observed Effluent Hardness			106 mg/L
		Reasonable Worst-case Upstream Receiving Water Hardness			44 mg/L
		Reasonable Worst-case Upstream Receiving Water Lead Concentration			1.1 µg/L¹
		Lead ECA_{chronic}²			3.1 µg/L
		Fully Mixed Downstream Ambient Concentration			
Effluent Fraction⁶		Hardness³ (mg/L) (as CaCO₃)	CTR Criteria⁴ (µg/L)	Lead⁵ (µg/L)	Complies with CTR Criteria
High Flow  Low Flow	1%	44.6	1.1	1.1	Yes
	5%	47.1	1.2	1.2	Yes
	15%	53.3	1.4	1.4	Yes
	25%	59.5	1.6	1.6	Yes
	50%	75.0	2.2	2.1	Yes
	75%	90.5	2.8	2.6	Yes
100%	106.0	3.4	3.1	Yes	

- ¹ Reasonable worst-case upstream receiving water lead concentration calculated using Equation 1 for chronic criterion at a hardness of **44 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-13 lists all the CTR hardness-dependent metals and the associated ECA used in this Order.

Table F-13. Summary of ECA Evaluations for CTR Hardness-dependent Metals

CTR Metals	ECA (µg/L, total recoverable)		
	CTR Acute	CTR Chronic	Basin Plan
Copper ¹	75.6	42.5	71.8
Chromium III	1800	217.1	--
Cadmium	4.6	2.6	0.67
Lead	80.2	3.1	--
Nickel	--	54.8	--
Silver	3.4	--	12
Zinc ²	3450.0	338.8	543.9

¹ Copper dilution credit (D) granted. D_{acute}=18:1 @ Hardness=47.3 mg/L as CaCO₃, D_{chronic}= 22:1@Hardness=46.7 mg/L as CaCO₃.
² Zinc dilution credit (D) granted. D_{acute}=55:1 @ Hardness=45.2 mg/L as CaCO₃, D_{chronic}= 4:1@Hardness=56.4 mg/L as CaCO₃.

3. Determining the Need for WQBELs

- a. The Regional 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 Regional 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 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; however, monitoring for those pollutants is established in this Order as required by the SIP. If the results of effluent monitoring demonstrate reasonable potential, this Order may be reopened and modified by adding an appropriate effluent limitation.

 Most constituents with no reasonable potential are not discussed in this Order. However, the following constituents were found to have no reasonable potential after assessment of the data:
 - i. **Electrical Conductivity (see Section IV.3.c. Salinity, below)**
 - ii. **Total Dissolved Solids (see Section IV.3.c. Salinity, below)**
- c. **Constituents with Limited Data.** Reasonable potential cannot be determined for the following constituents because effluent data are limited or ambient

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

background concentrations are not available. The Discharger is required to continue to monitor for these constituents in the effluent using analytical methods that provide the best feasible detection limits. When additional data become available, further analysis will be conducted to determine whether to add numeric effluent limitations or to continue monitoring.

i. Aluminum

- (a) WQO.** Aluminum is not a CTR constituent. USEPA developed National Recommended Ambient Water Quality Criteria (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. Secondary Maximum Contaminant Level - Consumer Acceptance Limit for aluminum is 200 µg/L.

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 (<10 mg/L as CaCO₃).

USEPA recommends that the ambient criteria are protective of the aquatic beneficial uses of receiving waters in lieu of site-specific criteria. Monitoring data demonstrates that these conditions are not similar to those in the Sacramento River, which consistently has an upstream hardness concentrations ranging from 44 and 94 mg/L as CaCO₃. This condition is not supportive of the applicability of the NAWQC for aluminum, according to USEPA's development document.

- (b) RPA Results.** To date, the Discharger has not been required to test for aluminum in the effluent, therefore effluent aluminum data is unavailable. The maximum background¹ aluminum concentration in the receiving water was 511 mg/L and the maximum background annual average was 211.5 mg/L. Section 1.3, Step 8 of the SIP allows the Central Valley Water Board to require additional monitoring for a pollutant in place of an effluent limitation if data are unavailable or insufficient. Therefore, the Central Valley Water Board is not establishing effluent limitations for aluminum at this time. Instead of limitations, effluent and receiving water monitoring has been established for aluminum and the Discharger must conduct a Constituent Study for aluminum. Should the monitoring and/or Study results indicate that the discharge has the reasonable potential to cause or contribute to an exceedance of a water quality standard, then this Order may be reopened and modified by adding an appropriate effluent limitation for aluminum.

¹ As measured at DWR Monitoring Station Sacramento River at Bend Bridge. Date range: January 2007 through December 2012.

ii. Nitrate and Nitrite.

- (a) **WQO.** DPH has adopted Primary MCLs for the protection of human health for nitrite and nitrate that are equal to 1 mg/L and 10 mg/L (measured as nitrogen), respectively. DPH has also adopted a primary MCL of 10 mg/L for the sum of nitrate and nitrite, measured as nitrogen.

USEPA has developed a primary MCL and an MCL goal of 1 mg/L for nitrite (as nitrogen). For nitrate, USEPA has developed Drinking Water Standards (10 mg/L as Primary MCL) and NAWQC for protection of human health (10 mg/L for non-cancer health effects). Recent toxicity studies have indicated a possibility that nitrate is toxic to aquatic organisms.

- (b) **RPA Results.** To date, the Discharger has not been required to test for nitrate and nitrite in the effluent, therefore effluent nitrate and nitrite data is unavailable. Section 1.3, Step 8 of the SIP allows the Central Valley Water Board to require additional monitoring for a pollutant in place of an effluent limitation if data are unavailable or insufficient. Therefore, the Central Valley Water Board is not establishing effluent limitations for nitrate and nitrite at this time. Instead of limitations, additional monitoring has been established for nitrate and nitrite. Additionally, this Order requires the Discharger to conduct a Constituent Study for nitrate and nitrite. Should the monitoring and/or Study results indicate that the discharge has the reasonable potential to cause or contribute to an exceedance of a water quality standard, then this Order may be reopened and modified by adding an appropriate effluent limitations for nitrate and nitrite.

iii. Salinity

- (a) **WQO.** 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 are no USEPA numeric water quality criteria for the protection of agricultural, live stock, and industrial uses. Numeric values for the protection of these uses are typically 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-14. Salinity Water Quality Criteria/Objectives

Parameter	Secondary MCL ²	USEPA NAWQC	Effluent	
			Max Annual Average	Maximum
EC (µmhos/cm)	900, 1600, 2200	N/A	534	676
TDS (mg/L)	500, 1000, 1500	N/A	389	482
Sulfate (mg/L)	250, 500, 600	N/A	N/A	N/A
Chloride (mg/L)	250, 500, 600	860 1-hr 230 4-day	N/A	N/A

² 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 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 µmhos/cm as a recommended level, 1600 µmhos/cm as an upper level, and 2200 µmhos/cm as a short-term maximum. The Basin Plan contains a site-specific receiving water EC limit not to exceed 230 µmhos/cm (50 percentile) or 235 µmhos/cm (90 percentile) in the at Sacramento River (at Knights Landing above Colusa Basin Drain), based upon the previous 10 years of record. Knights Landing is located approximately 150 miles downstream of the discharge location.

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 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.** The previous Order did not require the Discharger to monitor for chloride in the effluent or in the background receiving water. Therefore reasonable potential cannot be determined at this time due to the lack of chloride effluent and receiving water data. This Order establishes chloride monitoring in the effluent and receiving water.
- (2) **Electrical Conductivity.** A review of the Discharger's monitoring reports from January 2007 through December 2012 shows an average effluent EC of 497 $\mu\text{mhos/cm}$, with a range from 113 to 676 $\mu\text{mhos/cm}$. The maximum annual average effluent EC concentration was 534 $\mu\text{mhos/cm}$. These levels do not exceed the Secondary MCL EC limit of 900 $\mu\text{mhos/cm}$. The background receiving water EC averaged 249 $\mu\text{mhos/cm}$, with a maximum annual average of 358 $\mu\text{mhos/cm}$.
- (3) **Sulfate.** The previous Order did not require the Discharger to monitor for sulfate in the effluent or in the background receiving water. Therefore reasonable potential cannot be determined at this time due to the lack of effluent and receiving water sulfate data. This Order establishes chloride monitoring in the effluent and receiving water.
- (4) **Total Dissolved Solids.** A review of the Discharger's monitoring reports from January 2007 through December 2012 shows the average TDS effluent concentration was 343 mg/L with concentrations ranging from 258 mg/L to 482 mg/L, with a maximum annual effluent concentration of 389 mg/L. These levels do not exceed the Secondary MCL TDS limit of 500. The background receiving water TDS ranged

from 67 mg/L to 114 mg/L, with a maximum annual average of 86 mg/L.

- (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.*”

Based on the relatively low reported electrical conductivity and total dissolved solids, the discharge does not have reasonable potential to cause or contribute to an in-stream excursion of water quality objectives for electrical conductivity or total dissolved solids. Therefore, the EC and TDS effluent limitations from Order No. R5-2007-0041 have been removed. Chloride and sulfate data is unavailable at this time, therefore this Order establishes effluent and receiving water monitoring for chloride and sulfate.

Since the Discharger discharges to the Sacramento River and eventually the Sacramento-San Joaquin Delta, of additional concern is the salt

contribution to Delta waters. In order to ensure that the Discharger will continue to control the discharge of salinity, this Order includes a requirement to develop and implement a salinity evaluation and minimization plan. Also water supply monitoring is required to evaluate the relative contribution of salinity from the source water to the effluent.

- d. Constituents with Reasonable Potential.** The Regional 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 ammonia, BOD₅, TSS, chlorine residual, chlorodibromomethane, copper, dichlorobromomethane, pathogens, and zinc. WQBELs for these constituents are included in this Order. A summary of the RPA is provided in Attachment G, and a detailed discussion of the RPA for each constituent is provided below.

i. Ammonia

- (a) WQO.** The NAWQC for the protection of freshwater aquatic life for total ammonia, recommends acute (1-hour average; criteria maximum concentration or CMC) standards based on pH and chronic (30-day average; criteria continuous concentration or CCC) standards based on pH and temperature. USEPA also recommends that no 4-day average concentration should exceed 2.5 times the 30-day CCC. USEPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. Salmonids were more sensitive to acute toxicity effects than other species. However, while the acute toxicity of ammonia was not influenced by temperature, it was found that invertebrates and young fish experienced increasing chronic toxicity effects with increasing temperature. Because the Sacramento River has a beneficial use of cold freshwater habitat and the presence of salmonids and early fish life stages in the Sacramento River is well-documented, the recommended criteria for waters where salmonids and early life stages are present were used.

The maximum permitted effluent pH is 8.5, as the Basin Plan objective for pH in the receiving stream is the range of 6.5 to 8.5. In order to protect against the worst-case short-term exposure of an organism, a pH value of 8.5 was used to derive the acute criterion. The resulting acute criterion is 2.14 mg/L.

The maximum observed 30-day rolling average temperature and the maximum 30-day rolling average pH of the receiving water downstream of the discharge were used to calculate the 30-day CCC. The maximum observed 30-day average receiving water temperature was 54.0°F (12.25°C). The maximum 30-day rolling average receiving water pH value was 7.9. Using a pH value of 7.9 and the temperature value of 54.0°F (12.25°C) on a rolling 30-day basis, the resulting 30-day CCC is 2.8 mg/L (as N). The 4-day average concentration is derived in accordance with the USEPA criterion as 2.5 times the 30-day CCC. Based on the 30-day

CCC of 2.8 mg/L (as N), the 4-day average concentration that should not be exceeded is 7.0 mg/L (as N).

(b) RPA Results. The facility type may be used as information to aid in determining if the discharge may cause or contribute to an exceedance of a water quality objective and a WQBEL is required. The Facility treats domestic wastewater, which inherently contains ammonia at levels that can cause or threaten to cause an exceedance of a water quality objective. Nitrification is the biological process that converts ammonia to nitrates. Denitrification is a process that converts nitrates to nitrogen gas, which is then released to the atmosphere. The Discharger does not currently incorporate a dedicated process to fully nitrify the wastewater, however the use aeration basins that provide some nitrification. Potential inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream. Ammonia is known to cause toxicity to aquatic organisms in surface waters, so discharges of ammonia in concentrations that produce detrimental physiological responses to human, plant, animals, or aquatic life would violate the Basin Plan narrative toxicity objective. The maximum effluent concentration (MEC) for ammonia from January 2010 through December 2012 was 3.45 mg/L. Therefore, ammonia in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective and water-quality based effluent limits are required for ammonia. NAWQC. However, since June 2010 to present, monthly monitoring of ammonia in the effluent has not been detected above 1.0 mg/L.

(c) WQBELs. The Central Valley Water Board calculates WQBELs in accordance with SIP procedures for non-CTR constituents, and ammonia is a non-CTR constituent. The SIP procedure assumes a 4-day averaging period for calculating the long-term average discharge condition (LTA). However, USEPA recommends modifying the procedure for calculating permit limits for ammonia using a 30-day averaging period for the calculation of the LTA corresponding to the 30-day CCC. Therefore, while the LTAs corresponding to the acute and 4-day chronic criteria were calculated according to SIP procedures, the LTA corresponding to the 30-day CCC was calculated assuming a 30-day averaging period. The lowest LTA representing the acute, 4-day CCC, and 30-day CCC is then selected for deriving the average monthly effluent limitation (AMEL) and the maximum daily effluent limitation (MDEL). The remainder of the WQBEL calculation for ammonia was performed according to the SIP procedures. As discussed in Fact Sheet Section IV.C.2.c., an allowance for an acute aquatic-life dilution credit of 8:1 and chronic aquatic-life dilution credit of 3:1 may be granted. This Order contains a final average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for ammonia of 3.8 µg/L and 19.3 µg/L, respectively.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the MEC of 3.45 mg/L (as N) is less than the applicable WQBELs. Therefore, the Central Valley Water Board concludes that immediate compliance with these effluent limits is feasible

ii. Biochemical Oxygen Demand (BOD₅) and Total Suspended Solids (TSS)

(a) WQO. There are no applicable water quality objectives for BOD₅ and TSS for the receiving water. However, these compounds are oxygen-demanding substances that can reduce dissolved oxygen concentrations in the receiving water. The Basin Plan contains a water quality objective for the Sacramento River from Keswick Dam to Hamilton City for dissolved oxygen of 9.0 mg/L, from 1 June to 31 August, and 7.0 mg/L at all other times. Furthermore, the Basin Plan contains a water quality objective for suspended material that states, *“Waters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses.”*

(b) RPA Results. The Facility provides advanced-secondary filtration, therefore, based on water quality data for the effluent the discharge does not demonstrate reasonable potential to cause or contribute to the applicable water quality objectives. However, the facility type may be used as information to aid in determining if a water quality-based effluent limitation is required. BOD₅ is a measure of the amount of oxygen used in the biochemical oxidation of organic matter. The Discharger is a POTW that treats domestic wastewater. Domestic wastewater inherently contains BOD₅ and TSS. Unless properly treated, the discharge of BOD₅ and TSS can cause or contribute to the applicable water quality objectives in the receiving water.

(c) WQBELs. There are no numeric water quality objectives that are available to calculate WQBELs for BOD₅ and TSS. However, this facility provides advanced-secondary treatment and the process includes filtration. The principal design parameter for wastewater treatment plants is the daily BOD₅ and TSS loading rates and the corresponding removal rate of the system. The advanced-secondary treatment process removes BOD₅ and TSS and these compounds are used as indicators of the effectiveness of the treatment processes. Consequently, this Order ~~contains~~ includes effluent limits for BOD₅ and TSS ~~based on that reflect~~ the technical capability of the advanced-secondary (or tertiary) filtration process, protect the beneficial uses of the receiving water, and minimize degradation, to ensure compliance with the Antidegradation Policy, which states, “Any activity which produces or may produce a waste or increased volume or concentration of waste and which discharges or proposes to discharge to existing high quality waters will be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that (a) a pollution or

~~nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.”~~

This Order contains Average Monthly Effluent Limitations and Average Weekly Effluent Limitations for BOD₅ and TSS of 10 mg/L and ~~15~~ 15 mg/L, respectively, which is technically based on the capability of an advanced-secondary or tertiary system. In addition to the average weekly and average monthly effluent limitations, daily maximum effluent limitations for BOD₅ and TSS at 30 mg/L are included in the Order to ensure that the treatment works are not organically overloaded and operate in accordance with design capabilities.

(d) Plant Attainability. Analysis of the effluent data shows the Facility can meet these WQBELs.

iii. Chlorine Residual

(a) WQO. USEPA developed NAWQC for protection of freshwater aquatic life for chlorine residual. The recommended 4-day average (chronic) and 1-hour average (acute) criteria for chlorine residual are 0.011 µg/L and 0.019 µg/L, respectively. These criteria are protective of the Basin Plan’s narrative toxicity objective.

(b) RPA Results. Federal regulations at 40 C.F.R. §122.44(d)(1)(i) requires that, “*Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines 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.*” For priority pollutants, the SIP dictates the procedures for conducting the RPA. Chlorine is not a priority pollutant. Therefore, the Central Valley Water Board is not restricted to one particular RPA method. Due to the site-specific conditions of the discharge, the Central Valley Water Board has used its judgment in determining the appropriate method for conducting the RPA for this non-priority pollutant constituent.

USEPA’s September 2010 NPDES Permit Writer’s Manual, page 6-30, states, “*State implementation procedures might allow, or even require, a permit writer to determine reasonable potential through a qualitative assessment process without using available facility-specific effluent monitoring data or when such data are not available...A permitting authority might also determine that WQBELs are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBELs for pathogens in all permits for POTWs discharging to contact recreational waters).*” USEPA’s TSD also recommends that factors other than effluent data should be considered in the RPA, “*When determining whether or not a discharge causes, has the*

reasonable potential to cause, or contributes to an excursion of a numeric or narrative water quality criterion for individual toxicants or for toxicity, the regulatory authority can use a variety of factors and information where facility-specific effluent monitoring data are unavailable. These factors also should be considered with available effluent monitoring data.” With regard to POTWs, USEPA recommends that, *“POTWs should also be characterized for the possibility of chlorine and ammonia problems.”* (TSD, p. 50)

Treated domestic wastewater contains pathogens and viruses at levels that are harmful to human health if not adequately disinfected prior to discharge. The Discharger uses chlorine for disinfection, which is extremely toxic to aquatic organisms. The Discharger uses a sodium bisulfite process to dechlorinate the effluent prior to discharge to the Sacramento River. Due to the existing chlorine use and the potential for chlorine to be discharged, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the NAWQC. Therefore this order establishes effluent limitations for chlorine.

(c) WQBELs. The USEPA *Technical Support Document for Water Quality-Based Toxics Control* [EPA/505/2-90-001] contains statistical methods for converting chronic (4-day) and acute (1-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. However, because chlorine is an acutely toxic constituent that can and will be monitored continuously, an average 1-hour limitation is considered more appropriate than an average daily limitation. This Order contains a 4-day average effluent limitation and 1-hour average effluent limitation for chlorine residual of 0.011 µg/L and 0.019 µg/L, respectively, based on USEPA’s NAWQC, which implements the Basin Plan’s narrative toxicity objective for protection of aquatic life.

(d) Plant Performance and Attainability. Analysis of the effluent data shows the Facility can meet these WQBELs.

iv. Chlorodibromomethane

(a) WQO. The CTR includes a criterion of 0.41 µg/L for chlorodibromomethane for the protection of human health for waters from which both water and organisms are consumed.

(b) RPA Results. From September 2008 through December 2012 fifty-two effluent samples were collected and analyzed for chlorodibromomethane. The maximum effluent concentration (MEC) for chlorodibromomethane was 2.0 µg/L while the maximum observed upstream receiving water concentration was <0.07 µg/L (below the minimum RL of 0.5 µg/L). Section 1.3, Step 4 of the SIP states that if the maximum effluent

concentration is greater than or equal to the applicable criteria, an effluent limitation is required. Therefore, chlorodibromomethane in the discharge has reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for the protection of human health.

(c) WQBELs. The receiving water contains assimilative capacity for chlorodibromomethane, therefore, as discussed in section IV.C.2.c., a dilution credit of 8:1 was allowed in the development of the WQBELs for chlorodibromomethane. This Order contains a final average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for chlorodibromomethane of 3.1 µg/L and 7.3 µg/L, respectively, based on the CTR criterion for the protection of human health.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the MEC of 2.0 µg/L is less than the applicable WQBELs. Therefore, the Central Valley Water Board concludes that immediate compliance with these effluent limitations is feasible.

v. Copper

WQO. The Basin Plan and CTR include hardness dependent criteria for the protection of freshwater aquatic life for copper. Using USEPA conversion factors and reasonable worst-case measured hardness, as described in section VI.C.2.e. of this Fact Sheet, the applicable CTR criteria and Basin Plan objective are as follows:

Hardness (mg/L as CaCO ₃)	Water Quality Criterion/Objective (Total Recoverable, µg/L)		
	CTR acute	CTR chronic	Basin Plan Max
44 ¹	6.5	4.6	6.4
106 ²	14.8	9.8	14.1
47.3 ³	7.0	--	6.8
46.7 ⁴	--	5.0	--

¹ Minimum receiving water hardness.

² Minimum effluent hardness.

³ Applicable to site-specific conditions of an acute mixing zone of 18:1 only.

⁴ Applicable to site-specific conditions of a chronic mixing zone of 22:1 only.

(a) RPA Results From September 2008 through December 2012 fifty-four effluent samples were collected and analyzed for copper, total recoverable. The maximum effluent concentration (MEC) for copper was 30.4 µg/L (as total recoverable) while the maximum observed upstream receiving water concentration was 3.19 µg/L¹ (as total recoverable). Section 1.3, Step 4 of the SIP states that if the maximum effluent

¹ Data source: DWR Monitoring Station *Sacramento River at Bend Bridge*, January 2007 through December 2012.

concentration is greater than or equal to the applicable criteria, an effluent limitation is required. Therefore, copper in the discharge has reasonable potential to cause or contribute to an in-stream excursion above the CTR aquatic-life criteria and the Basin Plan Objective.

(b) WQBELs. The receiving water contains assimilative capacity for copper, therefore, as discussed in section IV.C.2.c., an acute aquatic-life dilution credit of 18:1 and a chronic aquatic-life dilution credit of 22:1 were allowed in the development of the WQBELs for copper. This Order contains a final average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for copper of 34.0 µg/L and 71.8 µg/L, respectively, based on the CTR criteria for the protection of freshwater aquatic life and the Basin Plan Objective.

(c) Plant Performance and Attainability. Analysis of the effluent data shows that the MEC of 30.4 µg/L is less than the applicable WQBELs. Therefore, the Central Valley Water Board concludes that immediate compliance with these effluent limitations is feasible.

vi. Dichlorobromomethane

(a) WQO. The CTR includes a criterion of 0.56 µg/L for dichlorobromomethane for the protection of human health for waters from which both water and organisms are consumed.

(b) RPA Results. From September 2008 through December 2012 fifty-five effluent samples were collected and analyzed for dichlorobromomethane. The maximum effluent concentration (MEC) for dichlorobromomethane was 13.0 µg/L while the maximum observed upstream receiving water concentration was <0.15 µg/L (less than the minimum RL of 0.5 µg/L). Section 1.3, Step 4 of the SIP states that if the maximum effluent concentration is greater than or equal to the applicable criteria, an effluent limitation is required. Therefore, dichlorobromomethane in the discharge has reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for the protection of human health.

(c) WQBELs. The receiving water contains assimilative capacity for dichlorobromomethane, therefore, as discussed in section IV.C.2.c., a dilution credit of 34:1 was allowed in the development of the WQBELs for dichlorobromomethane. This Order contains a final average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for dichlorobromomethane of 14.5 µg/L and 33.6 µg/L, respectively, based on the CTR criterion for the protection of human health.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the MEC of 13.0 µg/L is less than the applicable WQBELs. Therefore, the Central Valley Water Board concludes that immediate compliance with these effluent limitations is feasible.

vii. Pathogens

- (a) **WQO.** In a letter to the Regional Water Board dated 8 April 1999, DPH indicated it would consider wastewater discharged to water bodies with identified beneficial uses of irrigation or contact recreation and where the wastewater receives dilution of more than 20:1 (receiving water to effluent) to be adequately disinfected if the effluent coliform concentration does not exceed 23 MPN/100 mL as a 7-day median and if the effluent coliform concentration does not exceed 240 MPN/100 mL more than once in any 30 day period.
- (b) **RPA Results.** Municipal and domestic supply, agricultural irrigation, and body contact water recreation are beneficial uses of the Sacramento River. River flow to design effluent flow dilution of 20:1 is available, therefore, the DPH requirements are applicable to the discharge.
- (c) **WQBELs.** Pursuant to guidance from DPH, this Order includes effluent limitations for total coliform organisms of 23 MPN/100 mL as a 7-day median and 240 MPN/100 mL, not to be exceeded more than once in a 30-day period, in addition to a daily maximum not to exceed 500 MPN/100 mL. These coliform limits are imposed to protect the beneficial uses of the receiving water, including public health through contact recreation and drinking water pathways.
- (d) **Plant Performance and Attainability.** Analysis of the effluent data shows the Facility can meet these WQBELs.

viii. 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.** Federal regulations at 40 C.F.R. §122.44(d)(1)(i) requires that, *“Limitations must control all pollutants or pollutant parameters (either conventional, nonconventional, or toxic pollutants) which the Director determines 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.”* For priority pollutants, the SIP dictates the procedures for conducting the RPA. pH is not a priority pollutant. Therefore, the Central Valley Water Board is not restricted to one particular RPA method. Due to the site-specific conditions of the discharge, the Central Valley Water Board has used professional judgment in determining the appropriate method for conducting the RPA for this non-priority pollutant constituent.

USEPA’s September 2010 NPDES Permit Writer’s Manual, page 6-30, states, *“State implementation procedures might allow, or even require, a*

permit writer to determine reasonable potential through a qualitative assessment process without using available facility-specific effluent monitoring data or when such data are not available...A permitting authority might also determine that WQBELs are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBELs for pathogens in all permits for POTWs discharging to contact recreational waters).” USEPA’s TSD also recommends that factors other than effluent data should be considered in the RPA, “When determining whether or not a discharge causes, has the reasonable potential to cause, or contributes to an excursion of a numeric or narrative water quality criterion for individual toxicants or for toxicity, the regulatory authority can use a variety of factors and information where facility-specific effluent monitoring data are unavailable. These factors also should be considered with available effluent monitoring data.” (TSD, p. 50). The discharge of secondary treated wastewater has 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. Analysis of the effluent data shows the Facility can meet these WQBELs.

ix. Zinc

(a) WQO. The Basin Plan and CTR include hardness dependent criteria for the protection of freshwater aquatic life for zinc. Using USEPA conversion factors and reasonable worst-case measured hardness, as described in section VI.C.2.e. of this Fact Sheet, the applicable CTR criteria and Basin Plan objective are as follows:

Hardness (mg/L as CaCO ₃)	Water Quality Criterion/Objective (Total Recoverable, µg/L)		
	CTR acute	CTR chronic	Basin Plan Max
44 ¹	60	60	17.7
106 ²	126	126	36.7
45.2 ³	61	--	18.1
56.4 ⁴	--	74	--

¹ Minimum receiving water hardness.

² Minimum effluent hardness.

³ Applicable to site-specific conditions of an acute mixing zone of 51:1 only.

⁴ Applicable to site-specific conditions of a chronic mixing zone of 4:1 only.

(b) RPA Results. From September 2008 through December 2012 sixty-one effluent samples were collected and analyzed for zinc, total recoverable. The maximum effluent concentration (MEC) for zinc was 249 µg/L (as total recoverable) while the maximum observed upstream receiving water concentration was 7.79 µg/L¹ (as total recoverable). Section 1.3, Step 4 of the SIP states that if the maximum effluent concentration is greater than or equal to the applicable criteria, an effluent limitation is required. Therefore, zinc in the discharge has reasonable potential to cause or contribute to an in-stream excursion above the CTR aquatic-life criteria and the Basin Plan Objective.

(c) WQBELs. The receiving water contains assimilative capacity for zinc, therefore, as discussed in section IV.C.2.c., an acute aquatic-life dilution credit of 51:1 and a chronic aquatic-life dilution credit of 4:1 were allowed in the development of the WQBELs for zinc. This Order contains a final average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for zinc of 275.4 µg/L and 543.9 µg/L, respectively, based on the CTR criteria for the protection of freshwater aquatic life and the Basin Plan Objective.

(d) Plant Performance and Attainability. Analysis of the effluent data shows that the MEC of 249 µg/L is less than the applicable WQBELs. Therefore, the Central Valley Water Board concludes that immediate compliance with these effluent limitations is feasible.

e. Constituents with TMDL Waste Load Allocation. This Order includes WQBELs for constituents that have a TMDL waste load allocation.

i. Chlorpyrifos and Diazinon

(a) WQO. The Sacramento River has been identified on the 303(d) list as an impaired water body due to elevated concentrations of diazinon and chlorpyrifos. The Central Valley Water Board completed a TMDL for diazinon and chlorpyrifos in the Sacramento River and amended the Basin Plan to include water quality objectives and waste load allocations. The Basin Plan Amendment for the Control of Diazinon and Chlorpyrifos was adopted by the Central Valley Water Board on 21 October 2005 and was approved by the State Water Board on 2 May 2006. The Basin Plan amendment was approved by the Office of Administrative Law on 30 June 2006 and is now State law. The amendment was approved by USEPA and went into effect on 20 December 2006.

The amendment "...modifies the Basin Plan Chapter III (Water Quality Objectives) to establish site specific numeric objectives for chlorpyrifos and diazinon in the Sacramento River, and identifies the requirement to

¹ Data source: DWR Monitoring Station *Sacramento River at Bend Bridge*, January 2007 through December 2012.

meet the additive toxicity formula already in Basin Plan Chapter IV (Implementation), for the additive toxicity of diazinon and chlorpyrifos.”

The amendment provides that: *“The Waste Load Allocations (WLA) for all NPDES-permitted dischargers... shall not exceed the sum (S) of one (1) ad defined below.*

$$S = \frac{C_D}{WQO_D} + \frac{C_C}{WQO_C} \leq 1.0 \quad \text{(Equation 6)}$$

where

- C_D = diazinon concentration in $\mu\text{g/L}$ of the point source discharge...
- C_C = chlorpyrifos concentration in $\mu\text{g/L}$ of the point source discharge...
- WQO_D = acute or chronic diazinon water quality objective in $\mu\text{g/L}$
- WQO_C = acute or chronic chlorpyrifos water quality objective in $\mu\text{g/L}$

Available samples collected within the applicable averaging period for the water quality objective will be used to determine compliance with the allocations and loading capacity. For purposes of calculating the sum (S) above, analytical results that are reported as ‘non detectable’ concentrations are considered to be zero.”

- (b) RPA Results.** Effluent and receiving water data for the Facility is not available. However, the waste load allocation applies to all NPDES discharges. As stated above, chlorpyrifos and diazinon have been identified as constituents of concern in the Sacramento River, to which the discharge occurs.
- (c) WQBELs.** Average monthly effluent limitations and maximum daily effluent limitations have been calculated using the procedures in Section 1.4 of the SIP and consistent with the TMDL waste load allocation resulting in the following effluent limits for chlorpyrifos and diazinon.

Average Monthly Effluent Limitation

$$S_{AMEL} = \frac{C_{D-avg}}{0.079} + \frac{C_{C-avg}}{0.012} \leq 1.0$$

- C_{D-avg} = average monthly diazinon effluent concentration in $\mu\text{g/L}$
- C_{C-avg} = average monthly chlorpyrifos effluent concentration in $\mu\text{g/L}$

Maximum Daily Effluent Limitation

$$S_{MDEL} = \frac{C_{D-max}}{0.16} + \frac{C_{C-max}}{0.025} \leq 1.0$$

C_{D-max} = maximum daily diazinon effluent concentration in µg/L
 C_{C-max} = maximum daily chlorpyrifos effluent concentration in µg/L

(d) Plant Performance and Attainability. No data is available from the Facility to indicate the presence or absence of chlorpyrifos and diazinon. It is unlikely that chlorpyrifos and diazinon will be detected at concentrations exceeding applicable water quality objectives, as sales of all non-agricultural uses of diazinon were banned on 31 December 2004 and sales of the majority of non-agricultural uses of chlorpyrifos were banned in December 2001.

4. WQBEL Calculations

- a. This Order includes WQBELs for ammonia, chlorodibromomethane, copper, dichlorobromomethane, and zinc. 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.

$$AMEL = mult_{AMEL} \left[\min \left(\overbrace{M_A ECA_{acute}}^{LTA_{acute}}, M_C ECA_{chronic} \right) \right] \quad \text{(Equation 7)}$$

$$MDEL = mult_{MDEL} \left[\min \left(M_A ECA_{acute}, \underbrace{M_C ECA_{chronic}}_{LTA_{chronic}} \right) \right] \quad \text{(Equation 8)}$$

$$MDEL_{HH} = \left(\frac{mult_{MDEL}}{mult_{AMEL}} \right) AMEL_{HH} \quad \text{(Equation 9)}$$

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}

Table F-15. Summary of Water Quality-Based Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Conventional Pollutants						
Biochemical Oxygen Demand (5-day @ 20° C)	mg/L	10	15	30	--	--
	lbs/day ¹	209	313	626	--	--
Total Suspended Solids	mg/L	10	15	30	--	--
	lbs/day ¹	209	313	626	--	--
pH	s.u.	--	--	--	6.5	8.5
Priority Pollutants						
Chlorodibromomethane	µg/L	3.1	--	7.3	--	--
Chlorpyrifos	µg/L	WLA calculation ²	--	WLA calculation ²	--	--
Copper, Total Recoverable	µg/L	34.0	--	71.8	--	--
Diazinon	µg/L	WLA calculation ²	--	WLA calculation ²	--	--

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Conventional Pollutants						
Dichlorobromomethane	µg/L	14.5	--	33.6	--	--
Zinc, Total Recoverable	µg/L	275.4	--	543.9	--	--
Non-Conventional Pollutants						
Ammonia Nitrogen, Total (as N)	mg/L	3.8	--	19.3	--	--
Chlorine, Total Residual	mg/L	--	0.011 4-day avg.	0.019 1-hr avg.	--	--
Total Coliform Organisms	MPN/100 mL	240 ³	23 ⁴	500	--	--

¹ Based on a design dry weather treatment capacity of 2.5 mgd

² See Fact Sheet, Section IV.C.3.e.

³ Not to be exceeded more than once in 30-day period.

⁴ 7-day median limitation.

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 for discharges in the Sac/SJ Basins) The Basin Plan also states that, “*...effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate...*”.

For priority pollutants, the SIP dictates the procedures for conducting the RPA. Acute toxicity is not a priority pollutant. Therefore, the Central Valley Water Board is not restricted to one particular RPA method. Acute whole effluent toxicity is not a priority pollutant. Therefore, due to the site-specific conditions of the discharge, the Central Valley Water Board has used professional judgment in determining the appropriate method for conducting the RPA. USEPA’s September 2010 NPDES Permit Writer’s Manual, page 6-30, states, “*State implementation procedures might allow, or even require, a permit writer to determine reasonable potential through a qualitative assessment process without using available facility-specific effluent monitoring data or when such data are not available...A permitting authority might also determine that WQBELs are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBELs for pathogens in all permits for POTWs*

discharging to contact recreational waters).” Although the discharge has been consistently in compliance with the acute effluent limitations, the Facility is a POTW that treats domestic wastewater containing ammonia and other acutely toxic pollutants. Acute toxicity effluent limits are required to ensure compliance with the Basin Plan’s narrative toxicity objective.

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.*" Accordingly, 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 for discharges in the Sac/SJ Basins.) Based on chronic WET testing performed by the Discharger from January 2007 through December 2011, 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 Table F-16 below.

Table F-16. Whole Effluent Chronic Toxicity Testing Results

Date	Fathead Minnow		Water Flea		Green Algae
	<i>Pimephales promelas</i>		<i>Ceriodaphnia dubia</i>		<i>Selenastrum capricornutum</i>
	Survival (Tuc)	Growth (Tuc)	Survival (Tuc)	Reproduction (Tuc)	Growth (Tuc)
7 September 2011	1	1	1	1	1
17 September 2010	1	1	1	1	1
4 August 2009	1	1	1	1	1
4 August 2008	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 Regional 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. Dilution has been granted for the chronic condition. Therefore, this Order includes a monitoring trigger of 2 TU_c.

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 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

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)

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 based upon the design flow (Average Dry Weather Flow) permitted in section IV.A.1.f. of this Order.

2. Averaging Periods for Effluent Limitations

40 CFR 122.45 (d) requires average weekly and average monthly discharge limitations for publicly owned treatment works (POTWs) unless impracticable. However, for toxic pollutants and pollutant parameters in water quality permitting, USEPA recommends the use of a maximum daily effluent limitation in lieu of average weekly effluent limitations for two reasons. *“First, the basis for the 7-day average for POTWs derives from the secondary treatment requirements. This basis is not related to the need for assuring achievement of water quality standards. Second, a 7-day average, which could comprise up to seven or more daily samples, could average out peak toxic concentrations and therefore the discharge’s potential for causing acute toxic effects would be missed.”* (TSD, pg. 96) This Order utilizes maximum daily effluent limitations in lieu of average weekly effluent limitations for copper, zinc, ammonia, diazinon, chlorpyrifos, dichlorobromomethane, and chlorodibromomethane as recommended by the TSD for the achievement of water quality standards and for the protection of the beneficial uses of the receiving stream. Furthermore, for chlorine residual, and pH weekly average effluent limitations have been replaced or supplemented with effluent limitations utilizing shorter averaging periods. The rationale for using shorter averaging periods for these constituents 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 previous Order, with the exception of effluent limitations for copper, dichlorobromomethane, zinc, electrical conductivity, total dissolved solids, and temperature. The effluent limitations for these pollutants are less stringent than those in Order No. R5-2007-0041. This relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations, as explained below.

The following is a comparison of the copper, dichlorobromomethane, zinc, EC, TDS, and temperature effluent limitations in Order No. R5-2007-0041 to the new final effluent limitations:

Constituent	Order No. R5-2007-0041 Effluent Limits	New Final Limits
Copper, Total Recoverable	AMEL: 15.56 µg/L MDEL: 31.21 µg/L	AMEL: 34.0 µg/L MDEL: 71.8 µg/L
Dichlorobromomethane	AMEL: 13.32 µg/L MDEL: 26.72 µg/L	AMEL: 14.5 µg/L MDEL: 33.6 µg/L
Zinc, Total Recoverable	AMEL: 116.25 µg/L MDEL: 233.25 µg/L	AMEL: 275.4 µg/L MDEL: 543.9 µg/L
Electrical Conductivity	AMEL: 700 µmhos/cm	No limit
Total Dissolved Solids	AMEL: 450 mg/L MDEL: 1,000 mg/L	No limits
Temperature	Max temperature not to exceed background temperature by more than 20°F.	No limit

Order No. R5-2007-0041 established effluent limitations for copper, dichlorobromomethane, and zinc with dilution credits. During the past permit cycle the Discharger collected new effluent and receiving water copper and zinc data and conducted an update to the original (2006) Mixing Zone Study. Effluent and receiving water hardness data was also collected during the term of the past permit

cycle for the purpose of updating hardness-dependent metals criteria specific to the Facility location. The Mixing Zone update included an update to minimum and maximum receiving water and effluent flows, respectively. As discussed in section IV.C.2.c. of this Fact Sheet, mixing zones and dilution credits for aquatic-life and human health criteria are appropriate for copper, dichlorobromomethane, and zinc and assimilative capacity is available, based on updated information that was not available at the time Order No. R5-2007-0041 was adopted, which supports the calculation of less stringent effluent limits for copper, dichlorobromomethane, and zinc. This Order does not allocate all of the available assimilative capacity and establishes effluent limitations based on available dilution credit and past facility performance.

Order No. R5-2007-0041 also included effluent limitations on electrical conductivity, total dissolved solids, and temperature. Based on the new information obtained by the effluent and receiving water monitoring data collected during the past permit cycle, the discharge does not indicate reasonable potential to exceed water quality objectives or criteria for electrical conductivity, total dissolved solids, and temperature. Furthermore, this Order includes receiving water temperature limitations based on the Basin Plan receiving water temperature objective for the Sacramento River.

The Sacramento River, downstream of the discharge, is not listed as impaired for any of the subject constituents. Furthermore, the quality of the receiving water exceeds or otherwise meets the water quality standards for each of the subject constituents (i.e., the water quality standards have been attained).

Relaxation and removal of the WQBELs in the previous permit is in accordance with CWA section 303(d)(4), which allow for the relaxation or removal of WQBELs for attainment waters where antidegradation requirements are satisfied. Satisfaction of the Antidegradation Policy is discussed in the following section below. The relaxation and removal of the WQBELs is also in accordance with CWA section 402(o)(1)(B), which allows for the relaxation or removal of WQBELs when new information is available which was not available at the time of the previous permit issuance.

The Central Valley Water Board finds that the revised WQBELs will not cause the receiving water to violate the applicable state water quality standards adopted under the authority of CWA section 303. Relaxation or removal of the WQBELs is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Therefore, the modifications to these effluent limitations do not violate anti-backsliding requirements.

4. Satisfaction of Antidegradation Policy

This Order does not allow for an increase in flow or mass of pollutants to the receiving water. However, the effluent limitations for copper, dichlorobromomethane, and zinc have been increased relative to the previous

Order, as discussed above in section IV.D.3. The impact of the increase in concentration for each constituent is limited to within the boundaries of applicable mixing zones, as described in section IV.C.2(c). No new degradation will occur as a result of the change in effluent limitations. The characterization of the effluent is not expected to change. 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.** Domestic wastewater contains constituents such as total dissolved solids (TDS), specific conductivity, pathogens, nitrates, organics, metals and oxygen demanding substances (BOD). Percolation from the ponds, and digesters 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.

A groundwater limitation for total coliform organisms and nitrate (as N) has been included in this Order for protection of the MUN beneficial use of groundwater.

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 flow and percent removal requirements for BOD₅, and total suspended solids. The WQBELs consist of restrictions on acute toxicity, ammonia, BOD₅, chlorodibromomethane, copper, dichlorobromomethane, pH, total residual chlorine, total coliform bacteria, total suspended solids, diazinon, chlorpyrifos, and zinc. This Order’s technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements. The WQBELs implement numeric objectives to protect beneficial uses. The rationale for including these limitations is explained in the Fact Sheet.

This Order contains pollutant restrictions that are more stringent than applicable federal requirements and standards. Specifically, this Order includes effluent limitations for BOD₅ and TSS that are more stringent than applicable federal standards, but that are nonetheless necessary to meet numeric objectives or protect beneficial uses. The rationale for including these limitations is explained in section IV.C.3 of this Fact Sheet.

Table F-17. Summary of Final Effluent Limitations

Parameter	Units	Effluent Limitations					Basis ¹
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
Average Dry Weather Flow	mgd	--	--	2.5	--	--	DC
Biochemical Oxygen Demand 5-day @ 20°C	mg/L	10	15	30	--	--	TTC
	lbs/day	209	313	626	--	--	
	% Removal	85	--	--	--	--	CFR
Total Suspended Solids	mg/L	10	15	30	--	--	TTC
	lbs/day	209	313	626	--	--	
	% Removal	85	--	--	--	--	CFR
pH	s.u.	--	--	--	6.5	8.5	BP
CDBM	µg/L	3.1	--	7.3	--	--	CTR
Copper, Total Recoverable	µg/L	34.0	--	71.8	--	--	CTR
DCBM	µg/L	14.5	--	33.6	--	--	CTR
Zinc, Total Recoverable	µg/L	275.4	--	543.9	--	--	BP
Ammonia Nitrogen, Total (as N)	mg/L	3.8	--	19.3	--	--	NAWQC
Chlorine, Total Residual	mg/L	--	0.011 ²	0.019 ³	--	--	NAWQC
Chlorpyrifos	µg/L	See footnote 4	--	See footnote 5	--	--	TMDL
Diazinon	µg/L		--		--	TMDL	

Parameter	Units	Effluent Limitations					Basis ¹
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
Total Coliform Organisms	MPN/100 mL	240 ⁶	23 ⁷	500	--	--	DPH

¹ Based on an ADWF of 2.5 MGD.

² 4-day average limitation.

³ 1-hour average limitation.

⁴ Effluent concentrations of chlorpyrifos and diazinon shall not exceed the sum of one (1) as defined:

$$S_{AMEL} = \frac{C_{D-avg}}{0.079} + \frac{C_{C-avg}}{0.012} \leq 1.0$$

, where C_{D-avg} = average monthly diazinon effluent concentration in µg/L and C_{C-avg} = average monthly chlorpyrifos effluent concentration in µg/L.

⁵ Effluent concentrations of chlorpyrifos and diazinon shall not exceed the sum of one (1) as defined:

$$S_{MDEL} = \frac{C_{D-max}}{0.16} + \frac{C_{C-max}}{0.025} \leq 1.0$$

, where C_{D-max} = maximum daily diazinon effluent concentration in µg/L and C_{C-max} = maximum daily chlorpyrifos effluent concentration in µg/L.

⁶ No more than once in any 30-day period.

⁷ 7-day median limitations.

ND: Non Detect

DC – Based on the design capacity of the Facility.

TTC – Based on advanced-secondary/tertiary treatment capability. These effluent limitations reflect the capability of a properly operated advanced-secondary/tertiary treatment plant.

CFR – Based on secondary treatment standards contained in 40 CFR Part 133.

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.

TMDL – Based on the TMDL for chlorpyrifos and diazinon in the Sacramento River and Feather River Basins.

MCL – Based on the Primary Maximum Contaminant Level.

DPH – Based on CA Department of Public Health recommendations.

E. Interim Effluent Limitations – Not Applicable

F. Land Discharge Specifications

1. Land discharge specifications are necessary to protect the beneficial uses of the groundwater. The Discharger currently uses sludge storage basins that have the potential to affect the beneficial uses of groundwater.
2. Anaerobic (lacking oxygen) processes tend to produce aesthetically undesirable odors. To minimize production of undesirable odors, the Discharger is required to maintain some (at least 1.0 mg/L) dissolved oxygen in the upper one foot of the ponds.

G. Reclamation Specifications

Treated wastewater discharged for reclamation is regulated under separate reclamation requirements and must meet the requirements of CCR, Title 22.

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 Regional 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. Groundwater limitations are required to protect the beneficial uses of the underlying groundwater.

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 Regional 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

1. Influent monitoring is required to collect data on the characteristics of the wastewater and to assess compliance with effluent limitations (e.g., BOD₅ and TSS reduction requirements). The monitoring frequencies for BOD and TSS, weekly have been retained from Order No. R5-2007-0041.

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 for ammonia (monthly), BOD₅ (weekly), flow (continuous), pH (daily), total coliforms (twice per week), total residual chlorine (continuous), copper (monthly), zinc (monthly) dichlorobromomethane (monthly), chlorodibromomethane (monthly), and TSS (weekly) have been retained from Order No. R5-2007-0041 to determine compliance with effluent limitations for these parameters. Additional monitoring of hardness (monthly) and diazinon (yearly)

and chlorpyrifos (yearly) are required to determine compliance with effluent limitations for these parameters.

3. Effluent monitoring frequency for priority pollutants has changed from once per year to quarterly during the third year of the Order. In accordance with Section 1.3 of the SIP, periodic monitoring is required for priority pollutants for which criteria or objectives apply and for which no effluent limitations have been established. See Attachment I for more detailed requirements related to performing priority pollutant monitoring.
4. 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 pursuant 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 C.F.R. § 136.3(e), Table II).

C. Whole Effluent Toxicity Testing Requirements

1. **Acute Toxicity.** Quarterly 96-hour bioassay testing is required to demonstrate compliance with the effluent limitation for acute toxicity.
2. **Chronic Toxicity.** Annual chronic whole effluent toxicity testing is required in order to demonstrate compliance with the Basin Plan's narrative toxicity objective.

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. Receiving water monitoring frequencies and sample types for dissolved oxygen (weekly), electrical conductivity (weekly), fecal coliform organisms (monthly), hardness (monthly), pH (weekly), temperature (weekly), and turbidity (weekly) have been retained from Order R5-2007-0041.
- c. This Order establishes monthly receiving water monitoring requirements for hardness to ensure that adequate data is available to properly adjust water quality criteria for hardness-based metals.

- d. Priority pollutant data for the receiving water has been provided by the Discharger over the term of Order R5-2007-0041 and was used to conduct a meaningful RPA. In accordance with Section 1.3 of the SIP, periodic monitoring is required for priority pollutants for which criteria or objectives apply and for which no effluent limitations have been established. Consistent with Order R5-2007-0041, this Order requires monitoring for priority pollutants and other pollutants of concern, performed concurrently with effluent monitoring, in order to collect data to conduct an RPA for the next permit renewal. See Attachment I for more detailed requirements related to performing priority pollutant monitoring.

E. Other Monitoring Requirements

1. Biosolids Monitoring

Biosolids monitoring is required to ensure compliance with the biosolids disposal requirements contained in the Special Provision contained in section VI.C.6.a. of this Order. Biosolids disposal requirements are imposed pursuant to 40 CFR Part 503 to protect public health and prevent groundwater degradation.

2. Effluent and Receiving Water Characterization Study.

An effluent and receiving water monitoring study is required to ensure adequate information is available for the next permit renewal. During the third year of this permit term, the Discharger is required to conduct quarterly monitoring of the effluent at EFF-001 and of the receiving water at RSW-001 for all priority pollutants and other constituents of concern as described in Attachment I.

3. Land Discharge Monitoring

Land discharge monitoring is required to ensure that the discharge to the land disposal area complies with the Land Discharge Specifications in section IV.B. of this Order.

4. Reclamation Discharge Monitoring

Reclamation discharge monitoring for total coliform organisms is required in accordance with chapter 3, division 4, Title 22, CCR, Section 60321(a) and (c).

5. Water Supply Monitoring

Water supply monitoring is required to evaluate the source of constituents in the wastewater.

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 CWC is more stringent. In lieu of these conditions, this Order incorporates by reference CWC section 13387(e).

B. Special Provisions

1. Reopener Provisions

- a. **Mercury.** This provision allows the Regional Water Board to reopen this Order in the event mercury is found to be causing toxicity based on acute or chronic toxicity test results, or if a TMDL program is adopted. In addition, this Order may be reopened if the Regional Water Board determines that a mercury offset program is feasible for dischargers subject to NPDES permits.
- 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.
- c. **Water Effects Ratio (WER) and Metal Translators.** A default WER of 1.0 has been used in this Order for calculating CTR criteria for applicable priority pollutant inorganic constituents. In addition, default dissolved-to-total metal translators have been used to convert water quality objectives from dissolved to total recoverable when developing effluent limitations for copper and zinc. If the Discharger performs studies to determine site-specific WERs and/or site-specific dissolved-to-total metal translators, this Order may be reopened to modify the effluent limitations for the applicable inorganic constituents.

- d. Constituent Study.** There are indications that the discharge may contain constituents that have a reasonable potential to cause or contribute to an exceedance of water quality objectives. This Order requires the Discharger to complete a study of these constituents' potential effect in the receiving water. This reopener provision allows the Central Valley Water Board to reopen this Order for addition of effluent limitations and requirements for these constituents if after review of the study results it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of a water quality objective.
- e. Mixing Zone/Dilution Confirmation Study.** This Order requires the Discharger to submit a Mixing Zone/Dilution Confirmation Study. This Order may be reopened to modify dilution credits based on the results of the confirmation study, if necessary.
- f. Dilution Credits.** This provision allows the Central Valley Water Board to reopen this Order, as appropriate; to modify dilution credits should the facility performance, treatment or characteristics of the discharge or receiving water change. Modification of the dilution credit may include increasing the allowed dilution credit, if necessary.
- g. Ammonia Reduction Study.** Upon completion of the Ammonia Reduction Study, this Order may be reopened to add or modify final ammonia effluent limitations and/or mixing zone, as appropriate.
- h. Drinking Water Policy.** This provision allows the Central Valley Water Board to reopen this Order and incorporate monitoring of drinking water constituents to implement the Drinking Water Policy.
- i. Diazinon and Chlorpyrifos Basin Plan Amendment.** This provision allows the Central Valley Water Board to reopen this Order to modify diazinon and chlorpyrifos effluent limitations, as appropriate, in accordance with an amendment to the Basin Plan.

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 for discharges in the Sac/SJ Basins.) Based on whole effluent chronic toxicity testing performed by the Discharger from January 2007 through December 2011, 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 Regional 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 a toxicity is demonstrated.

Monitoring Trigger. A numeric toxicity monitoring trigger of > 2 TUc (where TUc = $100/\text{NOEC}$) is applied in the provision, because this Order does allow dilution for the chronic condition. Therefore, accelerated monitoring and requirements for a-TRE initiation is-are triggered when the effluent exhibits toxicity at less than 50% 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.

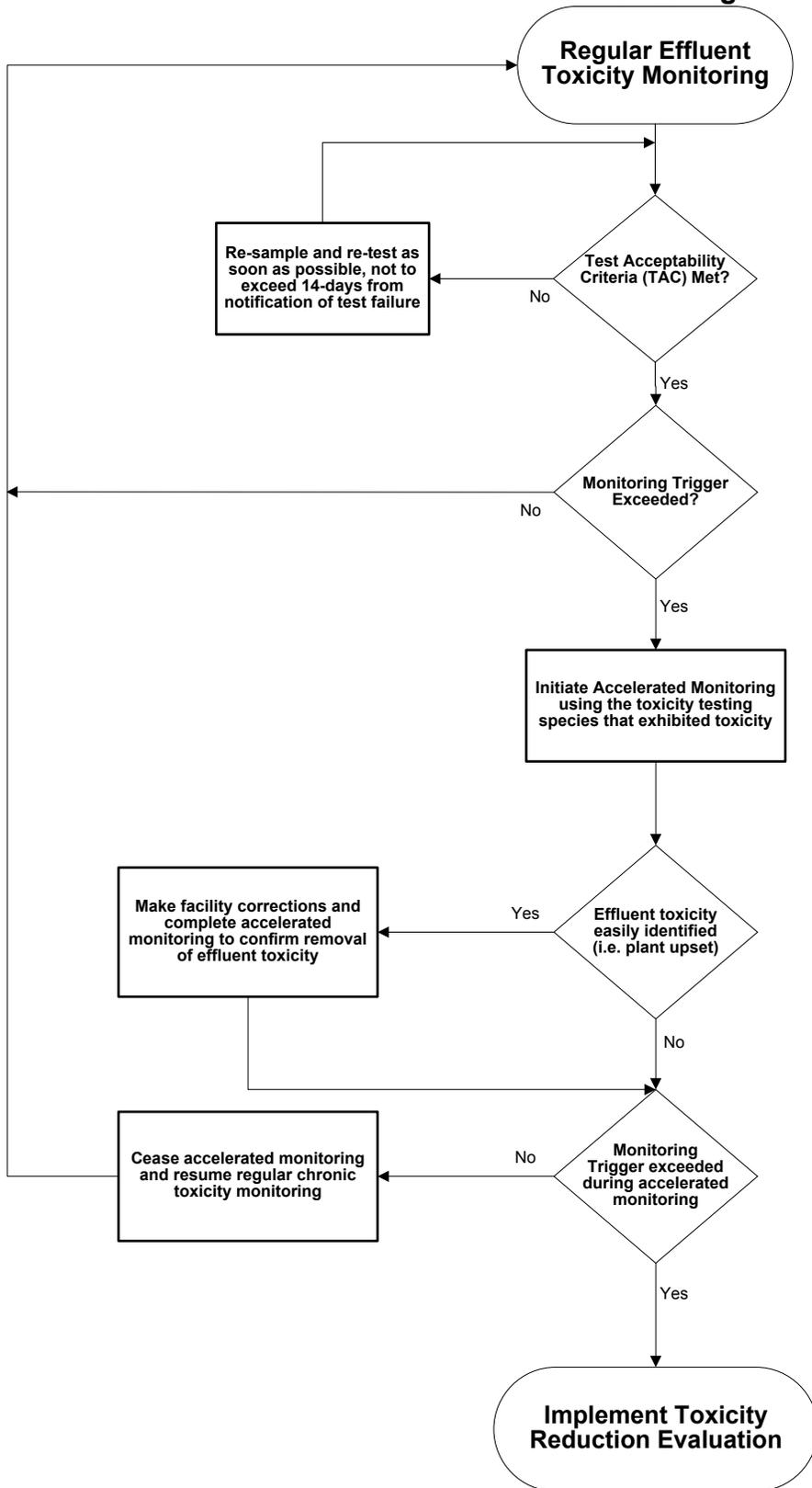
See the WET Accelerated Monitoring Flow Chart (Figure F-1), below, for further clarification of the accelerated monitoring requirements and for the decision points for determining the need for TRE initiation.

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. Constituent Study.** Effluent and receiving water monitoring data for aluminum and nitrate was insufficient for the purposes of determining whether reasonable potential to cause or contribute to an exceedance of water quality objectives for aluminum and nitrate exists. This Order requires the Discharger to complete a study in order to obtain monitoring data on aluminum and nitrate. If after a review of the study results it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of a water quality objective this Order may be reopened and effluent limitations added for the subject constituents
- c. Mixing Zone/Dilution Confirmation Study.** The Discharger is required to perform a Mixing Zone/Dilution Confirmation study, using a dye tracer, to verify the model results of the 2012 Mixing Zone and Dilution Study, within two years of the effective date of this Order. A Mixing Zone/Dilution Confirmation study is necessary to confirm the results of the numerical model results presented in the 2012 Mixing Zone and Dilution Study. The combined results of the numerical Mixing Zone and Dilution Study with the Dye Tracer study are essential to determining actual mixing zone conditions.
- d. Outfall Design Study.** The discharge outfall is a single-port outfall through a 2.5 feet diameter pipe located near the bottom of the river (i.e., the outfall does not have a multi-port diffuser). The Discharger is required to submit a study that evaluates the affects a multi-port diffuser on the outfall may have on minimizing the size of applicable mixing zones for each pollutant that has a mixing zone. A cost-benefit analysis on continuing the use of the single-port outfall versus installing a multi-port diffuser on the outfall shall be included in the Study. The Study shall also address impacts to receiving water biology as a result of the two design scenarios (single-port vs. multi-port).
- e. Ammonia Reduction Study.** An Ammonia Reduction Study is necessary to evaluate whether the facility's current treatment and control measures are resulting in an ammonia mixing zone that is as small as practicable. The study shall include a description of ammonia reduction measures implemented during the current permit cycle and/or scheduled for future implementation, site-specific constraints, if any, related to effluent ammonia reduction, and an evaluation of whether there are additional practicable ammonia reduction measures that may be implemented at the facility in order to reduce ammonia concentrations in the effluent and minimize the size of the ammonia mixing zone. The study shall be submitted by the Discharger 180 days prior to the expiration date of this Order.

3. Best Management Practices and Pollution Prevention

- a. Salinity Evaluation and Minimization Plan.** The Discharger shall prepare a salinity evaluation and minimization plan to identify and address sources of salinity from the Facility and evaluate efforts to minimize salt loading to the Sacramento River. The plan shall be completed and submitted to the Central Valley Water Board **within 9 months of the adoption date of this Order** for the approval by the Executive Officer.

4. Special Provisions for Municipal Facilities (POTWs Only)

a. Pretreatment Requirements.

The average dry weather design flow for the Facility is less than 5 mgd and the Facility does not receive discharges from Significant Industrial Users. Under these conditions, the Discharger is not required to develop a pretreatment program pursuant to USEPA regulations.

b. Continuous Monitoring Systems. This Order, and the Monitoring and Reporting Program which is a part of this Order, requires that certain parameters be monitored on a continuous basis. The Discharger has a system in place to automatically contact Facility operators in the event of alarms generated at the wastewater treatment plant. The Discharger is required to establish an electronic system for operator notification based on continuous recording device alarms. For any future facility upgrades, the Discharger shall upgrade the continuous monitoring and notification system simultaneously.

c. The State Water Board issued General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order No. 2006-0003-DWQ (General Order) on 2 May 2006. The General Order requires public agencies that own or operate sanitary sewer systems with greater than one mile of pipes or sewer lines to enroll for coverage under the General Order. The General Order requires agencies to develop sanitary sewer management plans (SSMPs) and report all sanitary sewer overflows (SSOs), among other requirements and prohibitions.

Furthermore, the General Order contains requirements for operation and maintenance of collection systems and for reporting and mitigating sanitary sewer overflows. Inasmuch that the Discharger's collection system is part of the system that is subject to this Order, certain standard provisions are applicable as specified in Provisions, section VI.C.5. For instance, the 24-hour reporting requirements in this Order are not included in the General Order. The Discharger must comply with both the General Order and this Order. The Discharger and public agencies that are discharging wastewater into the facility were required to obtain enrollment for regulation under the General Order by 1 December 2006.

5. Other Special Provisions

a. Ownership Change. To maintain the accountability of the operation of the Facility, the Discharger is required to notify the succeeding owner or operator of the existence of this Order by letter if, and when, there is any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger.

6. Compliance Schedules – Not Applicable

VIII. PUBLIC PARTICIPATION

The Regional 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 Regional Water Board staff has developed tentative WDRs. The Regional Water Board encourages public participation in the WDR adoption process.

A. Notification of Interested Parties

The Regional 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 physical posting, mailing and internet posting.

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 Regional Water Board at the address above on the cover page of this Order.

To be fully responded to by staff and considered by the Regional Water Board, written comments must be received at the Regional Water Board offices by 5:00 p.m. on **6 May 2013**.

C. Public Hearing

The Regional 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: 30/31 May 2013
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 Regional 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 Regional 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 5:00 p.m., Monday through Friday. Copying of documents may be arranged through the Regional Water Board by calling (530) 224-4845.

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 Regional 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 Greg Cash at (530) 224-3208.

ATTACHMENT G – SUMMARY OF REASONABLE POTENTIAL ANALYSIS

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
Aluminum (aquatic)	µg/L	NA	511	87	750	87 ⁽⁴⁾	--	--	--	--	Insufficient Data
Aluminum (HH)	µg/L	NA	211.5 ⁽⁶⁾⁽⁹⁾	200	--	--	--	--	--	200 ⁽³⁾	Insufficient Data
Ammonia Nitrogen, Total (as N)	mg/L	3.45	NA	2.14	2.14	2.8 ⁽⁷⁾ 7.0 ⁽⁸⁾	--	--	--	--	Yes
Cadmium	µg/L	0.07	<0.06	0.26 ⁽¹⁾ 0.76 ⁽²⁾	1.8 ⁽¹⁾ 4.8 ⁽²⁾	1.3 ⁽¹⁾ 2.6 ⁽²⁾	--	--	0.26 ⁽¹⁾ 0.76 ⁽²⁾	5 ⁽⁵⁾	No
Copper	µg/L	30.4	3.19 ⁽⁶⁾	4.6 ⁽¹⁾ 9.8 ⁽²⁾	6.5 ⁽¹⁾ 14.8 ⁽²⁾	4.6 ⁽¹⁾ 9.8 ⁽²⁾	1300	--	6.4 ⁽¹⁾ 14.1 ⁽²⁾	1000 ⁽⁵⁾	Yes
Chlorodibromomethane	µg/L	2.0	<0.07	0.41	--	--	0.41	46	--	80 ⁽⁵⁾	Yes
Dichlorobromomethane	µg/L	13.0	<0.15	0.56	--	--	0.56	--	--	80 ⁽⁵⁾	Yes
Dieldrin	µg/L	<0.002	<0.002	0.00014	0.24	0.056	0.00014	0.00014	--	--	No
Electrical Conductivity	µmhos/cm	676 534 ⁽⁹⁾	455 358 ⁽⁹⁾	900	--	--	--	--	--	900 ⁽³⁾	No
Lead	µg/L	2.0	<0.1	1.1 ⁽¹⁾ 3.4 ⁽²⁾	29 ⁽¹⁾ 88 ⁽²⁾	1.1 ⁽¹⁾ 3.4 ⁽²⁾	--	--	--	15 ⁽⁵⁾	No
Mercury	µg/L	0.0079	0.00094	0.77	1.4	0.77	0.05	--	--	--	No
Nitrate (as N)	mg/L	NA	NA	10	--	--	10	--	--	10	Insufficient Data
Nitrite (as N)	mg/L	NA	NA	1	--	--	--	--	--	1	Insufficient Data
Mercury	µg/L	0.0079	0.00094	0.77	1.4	0.77	0.05	--	--	--	No
PCBs sum (119 – 125)	µg/L	<0.05	<0.05	0.00017	--	0.014	0.00017	0.00017	--	0.5 ⁵	No
Total Dissolved Solids	mg/L	482 389 ⁽⁹⁾	114 ⁽⁶⁾ 86 ⁽⁶⁾⁽⁹⁾	500	--	--	--	--	--	500 ⁽⁵⁾	No
Silver	µg/L	0.46	0.8	0.99 ⁽¹⁾ 4.5 ⁽²⁾	0.99 ⁽¹⁾ 4.5 ⁽²⁾	--	--	--	12	100 ⁽³⁾	No
Zinc	µg/L	249	7.79 ⁽⁶⁾	17.7 ⁽¹⁾ 36.7 ⁽²⁾	60 ⁽¹⁾ 126 ⁽²⁾	60 ⁽¹⁾ 126 ⁽²⁾	--	--	17.7 ⁽¹⁾ 36.7 ⁽²⁾	5000 ⁽³⁾	Yes
4,4' -DDT	µg/L	<0.002	<0.002	0.00059	1.1 ¹⁰	0.001	0.00059	0.00059	--	--	No
4,4' -DDE (linked to DDT)	µg/L	<0.002	<0.002	0.00059	1.1 ^{4,10}	0.001 ⁴	0.00059	0.00059	--	--	No

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
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General Note: All inorganic concentrations are given as a total recoverable.

Data Date Range: 2008-2012, unless otherwise noted.

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) Based on receiving water hardness = 44 mg/L as CaCo₃

(2) Based on effluent hardness = 106 mg/L as CaCo₃

(3) Secondary MCL

(4) NAWQC

(5) Primary MCL

(6) DWR Monitoring Station Sacramento River at Bend Bridge
(Jan. 2007-Dec. 2012, excluding 2/23/09 data)

(7) 30-day CCC

(8) 4-day CCC

(9) Max. Annual Average

(10) Maximum (Instantaneous)

ATTACHMENT H – CALCULATION OF WQBELS

Parameter	Units	Most Stringent Criteria			Dilution Factors			HH Calculations			Aquatic Life Calculations									Final Effluent Limitations	
		HH	CMC	CCC	HH	CMC	CCC	ECA _{HH} = AMEL _{HH}	AMEL/MDEL Multiplier _{HH}	MDEL _{HH}	ECA Multiplier _{acute}	LTA _{acute}	ECA Multiplier _{chronic}	LTA _{chronic}	Lowest LTA	AMEL Multiplier ₉₅	AMEL _{AL}	MDEL Multiplier ₉₉	MDEL _{AL}	Lowest AMEL	Lowest MDEL
Ammonia Nitrogen, Total (as N)	mg/L	--	2.14	2.8	--	8	3	--	--	--	0.121	2.33	0.214	2.39	2.33	1.64	3.8	8.26	19.3	3.8	19.3
Copper, Total Recoverable	µg/L	1000	6.8 ¹	5.0 ²	--	18	22	1000	2.11	2112	0.292	21.0	0.49	22.1	21.0	1.62	34.0	3.4	71.8	34.0	71.8
Zinc, Total Recoverable	µg/L	5000	18.1 ³	74 ⁴	--	51	4	5000	1.97	9874	0.33	179.7	0.54	182.2	179.7	1.53	275.4	3.0	543.9	275.4	543.9
CDBM	µg/L	0.41	--	--	8	--	--	3.1	2.33	7.3	--	--	--	--	--	--	--	--	--	3.1	7.3
DCBM	µg/L	0.56	--	--	34	--	--	14.5	2.32	33.6	--	--	--	--	--	--	--	--	--	14.5	33.6
Chlorpyrifos ⁵	µg/L	--	0.025	0.015	--	--	--	--	--	--	0.321	0.008	0.527	0.0079	0.0079	1.55	0.012	3.11	0.025	0.012	0.025
Diazinon ⁵	µg/L	--	0.16	0.10	--	--	--	--	--	--	0.321	0.051	0.527	0.053	0.051	1.55	0.079	3.11	0.015	0.079	0.016

¹ Basin Plan WQO. Hardness = 47.3 mg/L CaCO₃, D_{acute}= 18:1

² Hardness = 46.7 mg/L CaCO₃, D_{chronic}= 22:1.

³ Basin Plan WQO. Hardness = 45.2 mg/L CaCO₃, D_{acute}= 55:1

⁴ Hardness = 56.4 mg/L CaCO₃, D_{chronic}= 4:1

⁵ The calculated AMEL and MDEL for chlorpyrifos and diazinon were used to determine effluent limitations consistent with the TMDL waste load allocation.

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 Regional 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. **Quarterly Monitoring.** Quarterly priority pollutant samples shall be collected from the effluent and upstream receiving water (EFF-001 and RSW-001) and analyzed for the constituents listed in Table I-1 **during the third year of the permit.** Quarterly monitoring shall be conducted for 1 year (4 consecutive samples, evenly distributed throughout the third year of the permit cycle) and the results of such monitoring be submitted to the Regional Water Board, during the fourth year of the permit term. 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.
- C. Sample type.** All effluent samples shall be taken as 24-hour flow proportioned composite samples. All receiving water samples shall be taken as grab samples.
- D. Sample type.** All effluent samples shall be taken as 24-hour time or flow proportioned composite samples¹⁸. All receiving water samples shall be taken as grab samples. Receiving water metals shall be analyzed for both dissolved and total recoverable concentrations.
- E. Additional Monitoring/Reporting Requirements.** The Discharger shall conduct the monitoring and reporting in accordance with the General Monitoring Provisions and Reporting Requirements in Attachment E.

Table I-1. Priority Pollutants and Other Constituents of Concern

CTR #	Constituent	CAS Number	Maximum Reporting Level ¹⁹ µg/L or noted
28	1,1-Dichloroethane	75343	1
30	1,1-Dichloroethene	75354	0.5
41	1,1,1-Trichloroethane	71556	2
42	1,1,2-Trichloroethane	79005	0.5
37	1,1,2,2-Tetrachloroethane	79345	0.5
75	1,2-Dichlorobenzene	95501	2
29	1,2-Dichloroethane	107062	0.5
	cis-1,2-Dichloroethene	156592	
31	1,2-Dichloropropane	78875	0.5
101	1,2,4-Trichlorobenzene	120821	1
76	1,3-Dichlorobenzene	541731	2
32	1,3-Dichloropropene	542756	0.5
77	1,4-Dichlorobenzene	106467	2
17	Acrolein	107028	2
18	Acrylonitrile	107131	2
19	Benzene	71432	0.5
20	Bromoform	75252	2

¹⁸ Volatile constituents shall be sampled in accordance with 40 CFR Part 136 or by methods approved by the Central Valley Water Board or the State Water Board.

¹⁹ The reporting levels required in these tables for priority pollutant constituents are established based on Section 2.4.2 and Appendix 4 of the SIP.

CTR #	Constituent	CAS Number	Maximum Reporting Level ¹⁹ µg/L or noted
34	Bromomethane	74839	2
21	Carbon tetrachloride	56235	0.5
22	Chlorobenzene (mono chlorobenzene)	108907	2
24	Chloroethane	75003	2
25	2- Chloroethyl vinyl ether	110758	1
26	Chloroform	67663	2
35	Chloromethane	74873	2
23	Dibromochloromethane	124481	0.5
27	Dichlorobromomethane	75274	0.5
36	Dichloromethane	75092	2
33	Ethylbenzene	100414	2
88	Hexachlorobenzene	118741	1
89	Hexachlorobutadiene	87683	1
91	Hexachloroethane	67721	1
94	Naphthalene	91203	10
38	Tetrachloroethene	127184	0.5
39	Toluene	108883	2
40	trans-1,2-Dichloroethylene	156605	1
43	Trichloroethene	79016	2
44	Vinyl chloride	75014	0.5
	Methyl-tert-butyl ether (MTBE)	1634044	
	Trichlorofluoromethane	75694	
	1,1,2-Trichloro-1,2,2-Trifluoroethane	76131	
	Styrene	100425	
	Xylenes	1330207	
60	1,2-Benzanthracene	56553	5
85	1,2-Diphenylhydrazine	122667	1
45	2-Chlorophenol	95578	5
46	2,4-Dichlorophenol	120832	5
47	2,4-Dimethylphenol	105679	2
49	2,4-Dinitrophenol	51285	5
82	2,4-Dinitrotoluene	121142	5
55	2,4,6-Trichlorophenol	88062	10
83	2,6-Dinitrotoluene	606202	5
50	2-Nitrophenol	25154557	10

CTR #	Constituent	CAS Number	Maximum Reporting Level ¹⁹ µg/L or noted
71	2-Chloronaphthalene	91587	10
78	3,3'-Dichlorobenzidine	91941	5
62	3,4-Benzofluoranthene	205992	10
52	4-Chloro-3-methylphenol	59507	5
48	4,6-Dinitro-2-methylphenol	534521	10
51	4-Nitrophenol	100027	10
69	4-Bromophenyl phenyl ether	101553	10
72	4-Chlorophenyl phenyl ether	7005723	5
56	Acenaphthene	83329	1
57	Acenaphthylene	208968	10
58	Anthracene	120127	10
59	Benzidine	92875	5
61	Benzo(a)pyrene (3,4-Benzopyrene)	50328	2
63	Benzo(g,h,i)perylene	191242	5
64	Benzo(k)fluoranthene	207089	2
65	Bis(2-chloroethoxy) methane	111911	5
66	Bis(2-chloroethyl) ether	111444	1
67	Bis(2-chloroisopropyl) ether	39638329	10
68	Bis(2-ethylhexyl) phthalate	117817	5
70	Butyl benzyl phthalate	85687	10
73	Chrysene	218019	5
81	Di-n-butylphthalate	84742	10
84	Di-n-octylphthalate	117840	10
74	Dibenzo(a,h)-anthracene	53703	0.1
79	Diethyl phthalate	84662	10
80	Dimethyl phthalate	131113	10
86	Fluoranthene	206440	10
87	Fluorene	86737	10
90	Hexachlorocyclopentadiene	77474	5
92	Indeno(1,2,3-c,d)pyrene	193395	0.05
93	Isophorone	78591	1
98	N-Nitrosodiphenylamine	86306	1
96	N-Nitrosodimethylamine	62759	5
97	N-Nitrosodi-n-propylamine	621647	5
95	Nitrobenzene	98953	10

CTR #	Constituent	CAS Number	Maximum Reporting Level ¹⁹ µg/L or noted
53	Pentachlorophenol	87865	1
99	Phenanthrene	85018	5
54	Phenol	108952	1
100	Pyrene	129000	10
	Aluminum	7429905	50
1	Antimony	7440360	5
2	Arsenic	7440382	10
15	Asbestos	1332214	
	Barium	7440393	
3	Beryllium	7440417	2
4	Cadmium	7440439	0.25
5a	Chromium (III)	7440473	50
5b	Chromium (VI)	18540299	10
6	Copper	7440508	2
14	Cyanide	57125	5
	Fluoride	7782414	
	Iron	7439896	
7	Lead	7439921	0.5
8	Mercury	7439976	0.5
	Manganese	7439965	
	Molybdenum	7439987	
9	Nickel	7440020	2
10	Selenium	7782492	5
11	Silver	7440224	0.25
12	Thallium	7440280	1
	Tributyltin	688733	
13	Zinc	7440666	10
110	4,4'-DDD	72548	0.05
109	4,4'-DDE	72559	0.05
108	4,4'-DDT	50293	0.01
112	alpha-Endosulfan	959988	0.02
103	alpha-Hexachlorocyclohexane (BHC)	319846	0.01
	Alachlor	15972608	
102	Aldrin	309002	0.005
113	beta-Endosulfan	33213659	0.01

CTR #	Constituent	CAS Number	Maximum Reporting Level ¹⁹ µg/L or noted
104	beta-Hexachlorocyclohexane	319857	0.005
107	Chlordane	57749	0.1
106	delta-Hexachlorocyclohexane	319868	0.005
111	Dieldrin	60571	0.01
114	Endosulfan sulfate	1031078	0.05
115	Endrin	72208	0.01
116	Endrin Aldehyde	7421934	0.01
117	Heptachlor	76448	0.01
118	Heptachlor Epoxide	1024573	0.01
105	Lindane (gamma-Hexachlorocyclohexane)	58899	0.02
119	PCB-1016	12674112	0.5
120	PCB-1221	11104282	0.5
121	PCB-1232	11141165	0.5
122	PCB-1242	53469219	0.5
123	PCB-1248	12672296	0.5
124	PCB-1254	11097691	0.5
125	PCB-1260	11096825	0.5
126	Toxaphene	8001352	0.5
	Atrazine	1912249	
	Bentazon	25057890	
	Carbofuran	1563662	
	2,4-D	94757	
	Dalapon	75990	
	1,2-Dibromo-3-chloropropane (DBCP)	96128	
	Di(2-ethylhexyl)adipate	103231	
	Dinoseb	88857	
	Diquat	85007	
	Endothal	145733	
	Ethylene Dibromide	106934	
	Glyphosate	1071836	
	Methoxychlor	72435	
	Molinate (Ordram)	2212671	
	Oxamyl	23135220	
	Picloram	1918021	
	Simazine (Princep)	122349	

CTR #	Constituent	CAS Number	Maximum Reporting Level ¹⁹ µg/L or noted
	Thiobencarb	28249776	
16	2,3,7,8-TCDD (Dioxin)	1746016	
	2,4,5-TP (Silvex)	93765	
	Diazinon	333415	
	Chlorpyrifos	2921882	
	Ammonia (as N)	7664417	
	Chloride	16887006	
	Flow		
	Hardness (as CaCO ₃)		
	Foaming Agents (MBAS)		
	Mercury, Methyl	22967926	
	Nitrate (as N)	14797558	
	Nitrite (as N)	14797650	
	pH		
	Phosphorus, Total (as P)	7723140	
	Specific conductance (EC)		
	Sulfate		
	Sulfide (as S)		
	Sulfite (as SO ₃)		
	Temperature		
	Total Dissolved Solids (TDS)		