CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

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ORDER R5-2017-0010

NPDES NO. CA0079731

WASTE DISCHARGE REQUIREMENTS FOR THE CITY OF REDDING CLEAR CREEK WASTEWATER TREATMENT PLANT SHASTA COUNTY

The following Discharger is subject to waste discharge requirements (WDR's) set forth in this Order:

Table 1. Discharger Information

Discharger	**City of Redding**
Name of Facility	**Clear Creek Wastewater Treatment Plant**
Facility Address	**2220 Metz Road**
	Anderson, CA 96007
	Shasta County

Table 2. Discharge Location

Discharge Point	Effluent Description	Discharge Point Latitude (North)	Discharge Point Longitude (West)	Receiving Water
001	**Advanced-Secondary Treated Wastewater**	**40.49903°**	**-122.36014°**	**Sacramento River**

Table 3. Administrative Information

This Order was adopted on:	**24 February 2017**
This Order shall become effective on:	**1 April 2017**
This Order shall expire on:	**31 March 2022**
The Discharger shall file a Report of Waste Discharge as an application for reissuance of WDR's in accordance with title 23, California Code of Regulations, and an application for reissuance of a National Pollutant Discharge Elimination System (NPDES) permit no later than:	**2 October 2021**
The U.S. Environmental Protection Agency (U.S. EPA) and the California Regional Water Quality Control Board, Central Valley Region have classified this discharge as follows:	**Major discharge**

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of the Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 24 February 2017.

Original Signed By
PAMELA C. CREEDON, Executive Officer

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I. FACILITY INFORMATION

Information describing the Clear Creek Wastewater Treatment Plant (Facility) is summarized in Table 1 and in sections I and II of the Fact Sheet (Attachment F). Section I of the Fact Sheet also includes information regarding the Facility's permit application.

II. FINDINGS

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

A. Legal Authorities. This Order serves as WDR's pursuant to article 4, chapter 4, division 7 of the California Water Code (commencing with section 13260).This Order is also issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. EPA and chapter 5.5, division 7 of the Water Code (commencing with section 13370). It shall serve as an NPDES permit for point source discharges from this facility to surface waters.

B. 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 the requirements in this Order, is hereby incorporated into and constitutes Findings for this Order. Attachments A through E and G through H are also incorporated into this Order.

C. Provisions and Requirements Implementing State Law. The provisions/requirements in subsections IV.B, IV.C, and V.B 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.

D. Monitoring and Reporting. 40 C.F.R. section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorize the Central Valley Water Board to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement federal and State requirements. The Monitoring and Reporting Program is provided in Attachment E.

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 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 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.

E. Notification of Interested Parties. The Central Valley Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe WDR's for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of the notification are provided in the Fact Sheet.

F. 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 R5-2010-0096. is rescinded upon the effective date of this Order except for enforcement purposes, and, in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the CWA and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order. This action in no way prevents the Central Valley Water Board from taking enforcement action for past violations of the previous Order.

III. DISCHARGE PROHIBITIONS

A. Discharge of wastewater from the Facility, as the Facility is specifically described in the Fact Sheet in section II.B, in a manner different from that described in this Order 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 Water Code.

D. The Discharger shall not allow pollutant-free wastewater to be discharged into the treatment or disposal system in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means rainfall, groundwater, cooling waters, and condensates that are essentially free of pollutants.

E. Discharge or application of waste classified as 'hazardous', as defined in California Code of Regulations, Title 23, Section 2521(a) is prohibited.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Discharge Point 001

1. Final Effluent Limitations – Discharge Point 001

The Discharger shall maintain compliance with the following effluent limitations at Discharge Point 001, with compliance measured at Monitoring Location EFF-001 as described in the Monitoring and Reporting Program, Attachment E:

a. The Discharger shall maintain compliance with the effluent limitations specified in Table 4:

Table 4. 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]	734	1101	2202	--	--

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Total Suspended Solids	mg/L	10	15	30	--	--
	lbs/day[1]	734	1101	2202	--	--
pH	standard units	--	--	--	6.0	8.0
Non-Conventional Pollutants						
Ammonia Nitrogen, Total (as N)	mg/L	2.80	4.83	--	--	--
	lbs/day[1]	250	354	--	--	--
Nitrate plus Nitrite, Total (as N)	mg/L	19.9	27.7	--	--	--
Priority Pollutants						
Copper, Total Recoverable	µg/L	20.2	--	32.0	--	--
Chlorodibromomethane	µg/L	3.56	--	7.20	--	--
Dichlorobromomethane	µg/L	15.56	--	29.22	--	--
Zinc, Total Recoverable	µg/L	79.7	--	116.7		

[1] Mass-based effluent limitations are based on a permitted average dry weather flow of 8.8 mgd.

b. **Percent Removal:** The average monthly percent removal of 5-day biochemical oxygen demand (BOD_5) 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. **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.

e. **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.

f. **Average Dry Weather Flow.** The average dry weather discharge flow shall not exceed 8.8 mgd.

g. **Chlorpyrifos and Diazinon.** Effluent chlorpyrifos and diazinon concentrations shall not exceed the sum of one (1.0) as defined below:

   i. **Average Monthly Effluent Limitation (AMEL)**

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

$C_{D\,M\text{-}avg}$ = average monthly diazinon effluent concentration (µg/L).
$C_{C\,M\text{-}avg}$ = average monthly chlorpyrifos effluent concentration (µg/L).

ii. **Average Weekly Effluent Limitation (AWEL)**

$$S_{AWEL} = \frac{C_{D\ W-avg}}{0.14} + \frac{C_{C\ W-avg}}{0.021} \leq 1.0$$

$C_{D\ W\text{-}avg}$ = weekly average diazinon effluent concentration (µg/L).
$C_{C\ W\text{-}avg}$ = weekly average chlorpyrifos effluent concentration (µg/L).

2. Interim Effluent Limitations – Not Applicable

B. Land Discharge Specifications – Not Applicable

C. Recycling Specifications – Not Applicable.

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

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

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 (MCL's) 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 0.16 µg/L (1-hour average) or 0.10 µg/L (4-day average) to occur more than once in a three year period.

i. Chlorpyrifos concentrations in excess of 0.025 µg/L (1-hour average) or 0.015 µg/L (4-day average) to occur more than once in a three year period.

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 MCL's specified in Table 64442 of section 64442 and Table 64443 of section 64443 of Title 22 of the California Code of Regulations.

11. **Salinity.** Electrical conductivity (at 25°C) shall not exceed 230 µmhos/cm (50 percentile) or 235 µmhos/cm (90 percentile) at Knights Landing above Colusa Basin Drain or 240 µmhos/cm (50 percentile) or 340 µmhos/cm (90 percentile) at I Street Bridge, 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 more stringent of the following applies:

    a. The natural receiving water temperature shall not be increased by more than 5°F at any time.

b. The receiving water temperature shall not be elevated above 56°F in the reach from Keswick Dam to Hamilton City during periods when temperature increases will be detrimental to the fishery.

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. Controllable factors shall not cause downstream turbidity to exceed 2 Nephelometric Turbidity Units (NTU) where natural turbidity is less than 1 NTU;

b. Shall not increase more than 1 NTU where natural turbidity is between 1 and 5 NTUs;

c. Shall not increase more than 20 percent where natural turbidity is between 5 and 50 NTUs;

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

e. Shall not increase more than 10 percent where natural turbidity is greater than 100 NTUs.

B. Groundwater Limitations

1. Release of waste constituents from any portion of the facility shall not cause groundwater to:

a. Contain constituents in concentrations that exceed either the Primary or Secondary MCLs established in the Title 22 of the California Code of Regulations, or natural background water quality, whichever is greater;

b. Contain total coliform organisms over any 7-day period equaling or exceeding 2.2 MPN/100 mL; or

c. Contain taste or odor-producing constituents, toxic substances, or any other constituents in concentrations that cause nuisance or adversely affect beneficial uses.

VI. PROVISIONS

A. Standard Provisions

1. The Discharger shall comply with all Standard Provisions included in Attachment D.

2. The Discharger shall comply with the following provisions. In the event that there is any conflict, duplication, or overlap between provisions specified by this Order, the more stringent provision shall apply:

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:

i. *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.

ii. *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.

iii. *Change in sludge use or disposal practice.* Under 40 CFR section 122.62(a)(1), a change in the Discharger's sludge use or disposal practice is a cause for modification of the permit. It is cause for revocation and reissuance if the Discharger requests or agrees.

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

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

The Discharger shall comply with effluent standards and prohibitions within the time provided in the regulations that establish those standards or prohibitions, even if this Order has not yet been modified.

d. This Order shall be modified, or alternately revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:

i. Contains different conditions or is otherwise more stringent than any effluent limitation in the Order; or

ii. Controls any pollutant limited in the Order.

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

e. The provisions of this Order are severable. If any provision of this Order is found invalid, the remainder of this Order shall not be affected.

f. The Discharger shall take all reasonable steps to minimize any adverse effects to waters of the State or users of those waters resulting from any discharge or sludge

use or disposal in violation of this Order. Reasonable steps shall include such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge or sludge use or disposal.

g. The Discharger shall ensure compliance with any existing or future pretreatment standard promulgated by USEPA under section 307 of the CWA, or amendment thereto, for any discharge to the municipal system.

h. A copy of this Order shall be maintained at the discharge facility and be available at all times to operating personnel. Key operating personnel shall be familiar with its content.

i. Safeguard to electric power failure:

   i. The Discharger shall provide safeguards to assure that, should there be reduction, loss, or failure of electric power, the discharge shall comply with the terms and conditions of this Order.

   ii. Upon written request by the Central Valley Water Board, the Discharger shall submit a written description of safeguards. Such safeguards may include alternate power sources, standby generators, retention capacity, operating procedures, or other means. A description of the safeguards provided shall include an analysis of the frequency, duration, and impact of power failures experienced over the past 5 years on effluent quality and on the capability of the Discharger to comply with the terms and conditions of the Order. The adequacy of the safeguards is subject to the approval of the Central Valley Water Board.

   iii. Should the treatment works not include safeguards against reduction, loss, or failure of electric power, or should the Central Valley Water Board not approve the existing safeguards, the Discharger shall, within 90 days of having been advised in writing by the Central Valley Water Board that the existing safeguards are inadequate, provide to the Central Valley Water Board and USEPA a schedule of compliance for providing safeguards such that in the event of reduction, loss, or failure of electric power, the Discharger shall comply with the terms and conditions of this Order. The schedule of compliance shall, upon approval of the Central Valley Water Board, become a condition of this Order.

j. The Discharger, upon written request of the Central Valley Water Board, shall file with the Board a technical report on its preventive (failsafe) and contingency (cleanup) plans for controlling accidental discharges, and for minimizing the effect of such events. This report may be combined with that required under the Central Valley Water Board Standard Provision contained in section VI.A.2.i of this Order.

   The technical report shall:

   i. Identify the possible sources of spills, leaks, untreated waste by-pass, and contaminated drainage. Loading and storage areas, power outage, waste treatment unit outage, and failure of process equipment, tanks and pipes should be considered.

   ii. Evaluate the effectiveness of present facilities and procedures and state when they became operational.

iii. Predict the effectiveness of the proposed facilities and procedures and provide an implementation schedule containing interim and final dates when they will be constructed, implemented, or operational.

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

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

l. The Discharger shall submit technical reports as directed by the Executive Officer. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code, sections 6735, 7835, and 7835.1. To demonstrate compliance with Title 16, CCR, sections 415 and 3065, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

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

n. For publicly owned treatment works, prior to making any change in the point of discharge, place of use, or purpose of use of treated wastewater that results in a permanent decrease of flow in any portion of a watercourse, the Discharger must file a petition with the State Water Board, Division of Water Rights, and receive approval for such a change. (Water Code section 1211).

o. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Central Valley Water Board.

To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the state of incorporation if a corporation, address and telephone number of the persons responsible for contact with the Central Valley Water Board and a statement. The

statement shall comply with the signatory and certification requirements in the federal Standard Provisions (Attachment D, section V.B) and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.

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 the Discharger does not comply or will be unable to comply for any reason, with any prohibition, effluent limitation, discharge specification, receiving water limitation, or groundwater limitation of 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 five days, unless the Central Valley Water Board waives confirmation. The written notification shall state the nature, time, duration, and cause of noncompliance, and shall describe the measures being taken to remedy the current noncompliance and prevent recurrence including, where applicable, a schedule of implementation. Other noncompliance requires written notification as above at the time of the normal monitoring report.

B. Monitoring and Reporting Program (MRP) Requirements

The Discharger shall comply with the MRP, and future revisions thereto, in Attachment E.

C. Special Provisions

1. Reopener Provisions

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

i. If new or amended applicable water quality standards are promulgated or approved pursuant to section 303 of the CWA, or amendments thereto, this permit may be reopened and modified in accordance with the new or amended standards.

ii. When new information, that was not available at the time of permit issuance, would have justified different permit conditions at the time of issuance.

b. 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 an applicable TMDL program is adopted, this Order shall be reopened and the mass effluent limitation modified (higher or lower) or an effluent

concentration limitation imposed. If the Central Valley 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 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 numeric 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 criteria for applicable 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 total recoverable 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.

f. **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 a water quality objective this Order may be reopened and effluent limitations added for the subject constituents.

g. **Drinking Water Policy.** On 26 July 2013 the Central Valley Water Board adopted Resolution No. R5-2013-0098 amending the Basin Plan and establishing a Drinking Water Policy. The State Water Board approved the Drinking Water Policy on 3 December 2013. This Order may be reopened to incorporate monitoring of drinking water constituents to implement the Drinking Water Policy.

h. **Effluent Limits Based on Facility Performance.** This Order may be reopened to revise interim and/or final effluent limitations where Facility performance was considered in development of the limitations (e.g., performance-based effluent limitations for copper, zinc, nitrate, disinfection byproducts) should the Discharger provide information demonstrating the increase in discharge concentrations have been caused by water conservation efforts, drought conditions, and/or the change in disinfection chemicals.

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.**

j. **Chronic Toxicity Trigger.** This Order may be reopened to revise the chronic toxicity monitoring trigger specified in Section VI.C.2.a if the Discharger provides new information demonstrating a higher trigger will ensure compliance with the Basin Plan's narrative toxicity objective. The new information, at a minimum, must include three species chronic whole effluent toxicity testing on the receiving water and effluent. This chronic toxicity testing shall be performed using the dilution series shown in Table E-4 to evaluate synergistic and/or additive toxicity effects in

the effluent and receiving water mixture. The information may be obtained through an individual or group study.

2. Special Studies, Technical Reports and Additional Monitoring Requirements

a. **Toxicity Reduction Evaluation Requirements.** 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 MRP 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 exceeds the numeric toxicity monitoring trigger during accelerated monitoring established in this Provision, the Discharger is required to initiate a Toxicity Reduction Evaluation (TRE) in accordance with an approved TRE Work Plan, 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 whole 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. The Discharger may request approval from the Executive Officer to participate in an approved group Toxicity Evaluation Study instead of a TRE or TRE/TIE if the Discharger has completed a TRE or TRE/TIE and has been unsuccessful in identifying the toxicant within the past 12 months.

i. **TRE Work Plan. Within 90 days of the effective date of this Order**, the Discharger shall submit to the Central Valley Water Board a TRE Work Plan for approval by the Executive Officer. The TRE Work Plan shall outline the procedures for identifying the source(s) of, and reducing or eliminating effluent toxicity. The TRE Work Plan must be developed in accordance with U.S. EPA guidance (See Fact Sheet VI.B.2.a for guidance reference) and be of adequate detail to allow the Discharger to immediately initiate a TRE as required in this Provision.

ii. **Accelerated Monitoring and TRE Initiation.** When the numeric toxicity monitoring trigger is exceeded during regular chronic toxicity monitoring, and the testing meets all test acceptability criteria, 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 TUc (where TUc = 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.

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 chronic toxicity

tests conducted once every two 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 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 a pattern 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 consecutive accelerated tests do not exceed the monitoring trigger. Upon confirmation that the effluent toxicity has been removed, the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring.

(c) If the result of any accelerated toxicity test exceeds the monitoring trigger, the Discharger shall cease accelerated monitoring and begin a TRE to investigate the cause(s) of, and identify corrective actions to reduce or eliminate effluent toxicity. Within thirty (30) days of notification by the laboratory of any test result exceeding the monitoring trigger during accelerated monitoring, the Discharger shall submit a TRE Action Plan to the Central Valley Water Board including, at minimum:

(1) Specific actions the Discharger will take to investigate and identify the cause(s) of toxicity, including a TRE WET monitoring schedule;

(2) Specific actions the Discharger will take to mitigate the impact of the discharge and prevent the recurrence of toxicity; and

(3) A schedule for these actions.

b. **Constituent Study.** There are indications that the discharge may contain constituents that have a reasonable potential to cause or contribute to an exceedance of the water quality objective for indeno (1,2,3-cd) pyrene. The Discharger shall conduct, at minimum, quarterly effluent monitoring and semi-annual receiving water monitoring for indeno (1,2,3-cd) pyrene during the first two 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 by **1 December 2019**.

3. Best Management Practices and Pollution Prevention

a. **Salinity Evaluation and Minimization Plan.** The Discharger shall continue to implement a salinity evaluation and minimization plan to identify and address sources of salinity discharged from the Facility. The Discharger shall evaluate the effectiveness of the salinity evaluation and minimization plan and provide a summary with the Report of Waste Discharge, **due 180 days prior to the permit expiration date**. The summary shall include municipal water supply quality and quantity data from within the Discharger's service area. Total dissolved solids and electrical conductivity or specific conductance shall be reported as a weighted average of groundwater and surface water quality using the most recent published information from the Discharger's service area and other databases available to the public.

4. Construction, Operation and Maintenance Specifications

a. **Pond Operating Requirements (Flow-Equalization Basins, Emergency Storage Ponds, and Facultative Sludge Lagoons).**

i. The treatment facilities 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. Freeboard for the ponds shall never be less than 2 feet (measured vertically to the lowest point of overflow).

v. The discharge of waste classified as "hazardous" as defined in section 2521(a) of title 23 of the CCR, or "designated", as defined in Water Code section 13173, to the treatment ponds is prohibited.

vi. 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).

vii. Ponds shall not have a pH less than 6.0 or greater than 9.0.

viii. As means of discerning compliance with item vi. Above, the dissolved oxygen content in the upper zone (1 foot) of wastewater in ponds shall not be less than 1.0 mg/L.

b. **Effluent Diffuser Line.** The effluent outfall and diffuser line shall be maintained to ensure proper function and flow-through capacity.

5. Special Provisions for Municipal Facilities (POTW's Only)

a. **Pretreatment Requirements**

i. The Discharger shall be responsible and liable for the performance of all Control Authority pretreatment requirements contained in 40 C.F.R. part 403, including any subsequent regulatory revisions to 40 C.F.R. part 403. Where 40 C.F.R. part 403 or subsequent revision places mandatory actions upon the Discharger as Control Authority but does not specify a timetable for completion of the actions, the Discharger shall complete the required actions within 6 months from the issuance date of this permit or the effective date of the 40 CFR Part 403 revisions, whichever comes later. For violations of pretreatment requirements, the Discharger shall be subject to enforcement actions, penalties, fines, and other remedies by USEPA or other appropriate parties, as provided in the CWA. USEPA may initiate enforcement action against a

nondomestic user for noncompliance with applicable standards and requirements as provided in the CWA.

ii. The Discharger shall enforce the requirements promulgated under sections 307(b), 307(c), 307(d), and 402(b) of the CWA with timely, appropriate and effective enforcement actions. The Discharger shall cause all nondomestic users subject to federal categorical standards to achieve compliance no later than the date specified in those requirements or, in the case of a new nondomestic user, upon commencement of the discharge.

iii. The Discharger shall perform the pretreatment functions as required in 40 C.F.R. part 403 including, but not limited to:

(a) Implement the necessary legal authorities as provided in 40 CFR section 403.8(f)(1);

(b) Enforce the pretreatment requirements under 40 C.F.R. section 403.5 and 403.6;

(c) Implement the programmatic functions as provided in 40 C.F.R.section 403.8(f)(2); and

(d) Provide the requisite funding and personnel to implement the pretreatment program as provided in 40 C.F.R. section 403.8(f)(3).

iv. **Pretreatment Reporting Requirements.** Pretreatment reporting requirements are included in the Monitoring and Reporting Program, section X.D.4 of Attachment E.

v. **Within 3 years of the permit effective date**, and as required by 40 CFR 122.44(j)(2)(ii), the Discharger shall submit a written technical evaluation of the need to revise local limits under 40 CFR 403.5(c)(1).

b. **Sludge/Biosolids Treatment or 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 C.F.R. 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, storage, 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.

Sludge and solid waste shall be removed from screens, sumps, ponds, clarifiers, etc. as needed to ensure optimal plant performance.

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.

ii. The use, disposal, storage, and transportation of biosolids shall comply with existing federal and state laws and regulations, including permitting requirements and technical standards included in 40 C.F.R. part 503. If the State Water Board and the Central Valley Water Board are given the authority to implement regulations contained in 40 C.F.R. 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 C.F.R. part 503 whether or not they have been incorporated into this Order.

iii. The Discharger shall comply with Section IX.A. Biosolids of the Monitoring and Reporting Program, Attachment E.

iv. 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.

v. **Within 180 days of the permit effective date,** the Discharger shall submit an updated biosolids use or disposal plan to the Central Valley Water Board. The plan shall describe at a minimum:

(a) Sources and amounts of 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 present classification of the landfill; and the name and location of the landfill.

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

Limited portions of the wastewater collection system may be outside the service area of the Discharger. The Discharger shall establish multijurisdictional agreements whenever another jurisdiction, or industrial user located within another jurisdiction, contributes wastewater to the discharger's collection system. The multijurisdictional agreements shall contain, at a minimum, a requirement that the user comply with all applicable portions of the Discharger's sewer use ordinance, including requirements for maintenance of the collection system. The agreements shall also include provisions specifying which pretreatment implementation activities, such as inspection, sampling and enforcement, will be conducted by the contributing jurisdiction; which of these activities will be conducted by the Discharger; and which of these activities will be conducted jointly by the contributing

jurisdiction and the Discharger. The Discharger shall comply with the following time schedule:

Task		Compliance Date
i.	Submit interagency agreements for existing connections	90 days after effective date
ii.	Submit interagency agreements for new connections	30 days prior to connection

d. **Anaerobically Digestible Material.** If the Discharger proposes to receive hauled-in anaerobically digestible material for injection into an anaerobic digester for co-digestion, the Discharger shall notify the Central Valley Water Board and develop and implement standard operating procedures (SOP's) for this activity prior to initiation of the hauling. The SOP's shall address material handling, including unloading, screening, or other processing prior to anaerobic digestion; transportation; spill prevention; and spill response. In addition, the SOP's shall address avoidance of the introduction of materials that could cause interference, pass-through, or upset of the treatment processes; avoidance of prohibited material, vector control, odor control, operation and maintenance, and the disposition of any solid waste segregated from introduction to the digester. The Discharger shall provide training to its staff on the SOP's and shall maintain records for a minimum of three years for each load received, describing the hauler, waste type, and quantity received. In addition, the Discharger shall maintain records for a minimum of three years for the disposition, location, and quantity of accumulated pre-digestion-segregated solid waste hauled off-site.

6. Other Special Provisions – Not Applicable

7. Compliance Schedules – Not Applicable

VII. COMPLIANCE DETERMINATION

A. BOD_5 and TSS Effluent Limitations (Section IV.A.1.a. and IV.A.1.b.). Compliance with the final effluent limitations for BOD_5 and TSS required in Limitations and Discharge Requirements section IV.A.1 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 BOD_5 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 (Section IV.A.1.g.). 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. Instantaneous Minimum and Maximum Effluent Limitation for pH (Section IV.A.1.a.). If the analytical result of a single grab sample is lower than the instantaneous minimum effluent limitation for a parameter, the Discharger will be considered out of compliance for that parameter for that single sample. Non-compliance for each sample will be considered separately (e.g., the results of two grab samples taken within a calendar day that both are lower than the instantaneous minimum effluent limitation would result in two instances of non-compliance with the instantaneous minimum effluent limitation). If pH is monitored continuously, the Discharger shall be in compliance with pH limitations provided that the total excursion time does not exceed 20 minutes within a calendar day. For the purpose of establishing a pH excursion, a 20-minute running average may be used (measured continuously at no greater than 5 second intervals).

E. Total Residual Chlorine Effluent Limitations (Section IV.A.1.d.). 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. 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:

Mass (lbs/day) = Flow (MGD) x Concentration (mg/L) x 8.34 (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.

G. 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.

H. Dissolved Oxygen Receiving Water Limitation (Section V.A.5.a-d). The Facility provides a high level of treatment including tertiary filtration and nitrification, which results in minimal dissolved oxygen impacts in the receiving water. Weekly receiving water monitoring is required in the Monitoring and Reporting Program (Attachment E) and is sufficient to evaluate the impacts of the discharge and compliance with this Order. Weekly receiving water monitoring data, measured at monitoring locations RSW-001 and RSW-002, will be used to determine compliance with part “c” and “d” of the dissolved oxygen receiving water limitation to ensure the discharge does not cause the dissolved oxygen concentrations in the Sacramento River to be reduced below 7.0 mg/L (or below 9.0 mg/L from 1 June to 31 August) at any time. However, should more frequent dissolved oxygen and temperature receiving water monitoring be conducted, Central Valley Water Board staff may evaluate compliance with parts “a” and “b”.

I. Acute Whole Effluent Toxicity Effluent Limitation (Section IV.A.1.c). For each 96-hour acute bioassay test result, compliance with the acute WET 90% median survival effluent limitation shall be determined based on the median of that test result and the previous two test results.

J. Turbidity Receiving Water Limitation (Section V.A.18). Compliance shall be determined using data samples from Monitoring Location RSW-002 and analyzed with data samples for natural turbidity at Monitoring Location RSW-001.

K. pH Receiving Water Limitation (Section V.A.8.). Compliance shall be determined using data samples from Monitoring Location RSW-002 and analyzed with data samples for natural pH at Monitoring Location RSW-001.

L. Temperature Receiving Water Limitation (Section V.A.16.). Compliance shall be determined using data samples from Monitoring Location RSW-002 and analyzed with data samples for natural temperature at Monitoring Location RSW-001.

M. Chlorpyrifos and Diazinon Effluent Limitations (Section IV.A.1.h.). 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.

N. 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.

O. Whole Effluent Chronic Toxicity (Test of Significant Toxicity). The Discharger may elect to use the test of significant toxicity (TST) to verify the results of the NOEC when the numeric chronic toxicity trigger is exceeded. If the results of a chronic toxicity monitoring test results in a “Pass” using the TST, then the discharge is considered in compliance with the numeric chronic toxicity monitoring trigger.

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 one 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. Sample results reported as DNQ are estimated concentrations.

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 U.S. EPA guidance (Technical Support Document For Water Quality-based Toxics Control, March 1991, second printing, EPA/505/2-90-001).

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

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

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

Inland Surface Waters
All surface waters of the state that do not include the ocean, enclosed bays, or estuaries.

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

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

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

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

Method Detection Limit (MDL)
MDL is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in in 40 C.F.R. part 136, Attachment B, revised as of July 3, 1999.

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

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

Not Detected (ND)
Sample results which are less than the laboratory's MDL.

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

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

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

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

clear environmental benefits of such an approach are identified to the satisfaction of the State Water Resources Control Board (State Water Board) or Central Valley Water Board.

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 Central Valley Water Board Basin Plan.

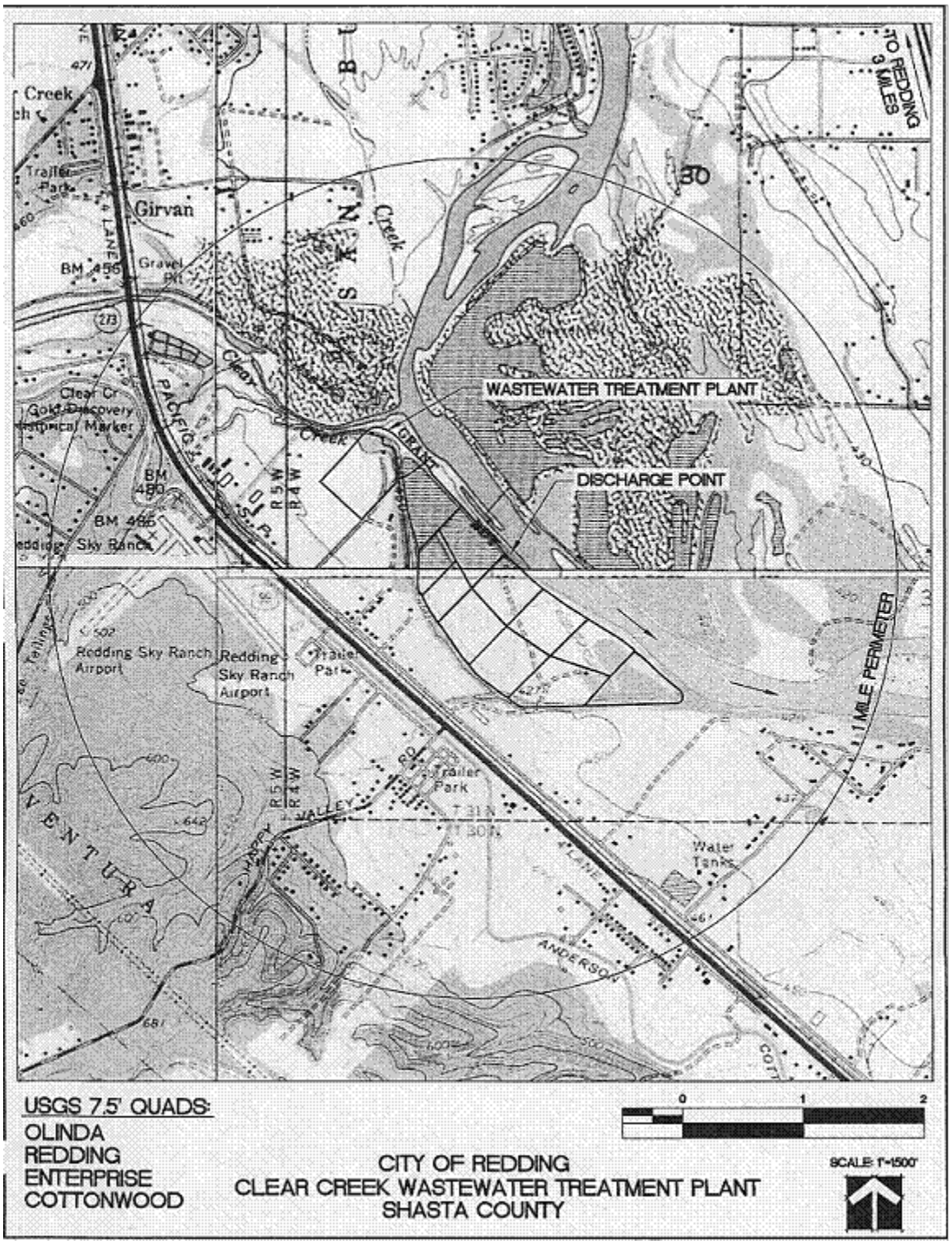
Standard Deviation (σ)
Standard Deviation is a measure of variability that is calculated as follows:

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

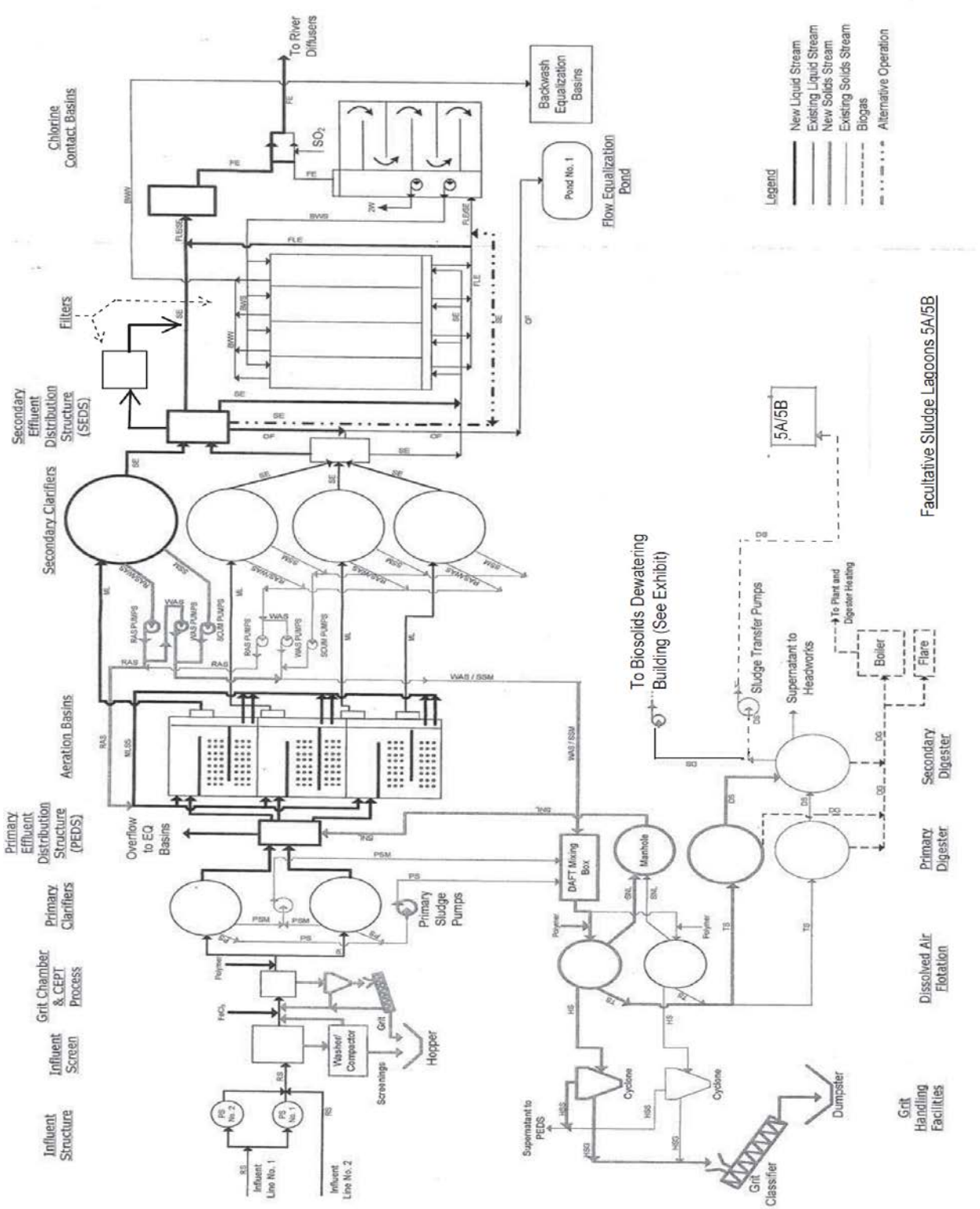
where:
x is the observed value;
μ is the arithmetic mean of the observed values; and
n is the number of samples.

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



ATTACHMENT C –FLOW SCHEMATIC



ATTACHMENT D – STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the terms, requirements, and conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code and is grounds for enforcement action; permit termination, revocation and reissuance, or modification; denial of a permit renewal application; or a combination thereof. (40 C.F.R. § 122.41(a); Wat. Code, §§ 13261, 13263, 13265, 13268, 13000, 13001, 13304, 13350, 13385.)

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 C.F.R. § 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 C.F.R. § 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 C.F.R. § 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 C.F.R. § 122.41(e).)

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges. (40 C.F.R. § 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 C.F.R. § 122.5(c).)

F. Inspection and Entry

The Discharger shall allow the Central Valley Water Board, State Water Board, U.S. EPA, 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 (33 U.S.C. § 1318(a)(4)(B); 40 C.F.R. § 122.41(i); Wat. Code, § 13267, 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 (33 U.S.C § 1318(a)(4)(B)(ii); 40 C.F.R. § 122.41(i)(1); Wat. Code, §§ 13267, 13383);

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (33 U.S.C. § 1318(a)(4)(B)(ii); 40 C.F.R. § 122.41(i)(2); Wat. Code, §§ 13267, 13383);

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (33 U.S.C § 1318(a)(4)(B)(ii); 40 C.F.R. § 122.41(i)(3); Wat. Code, § 13267, 13383); and

4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location. (33 U.S.C § 1318(a)(4)(B); 40 C.F.R. § 122.41(i)(4); Wat. Code, §§ 13267, 13383.)

G. Bypass

1. Definitions

   a. “Bypass” means the intentional diversion of waste streams from any portion of a treatment facility. (40 C.F.R. § 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 C.F.R. § 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 C.F.R. § 122.41(m)(2).)

3. Prohibition of bypass. Bypass is prohibited, and the Central Valley Water Board may take enforcement action against a Discharger for bypass, unless (40 C.F.R. § 122.41(m)(4)(i)):

   a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage (40 C.F.R. § 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 C.F.R. § 122.41(m)(4)(i)(B)); and

   c. The Discharger submitted notice to the Central Valley Water Board as required under Standard Provisions – Permit Compliance I.G.5 below. (40 C.F.R. § 122.41(m)(4)(i)(C).)

4. The Central Valley Water Board may approve an anticipated bypass, after considering its adverse effects, if the Central Valley Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above. (40 C.F.R. § 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 C.F.R. § 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 C.F.R. § 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 C.F.R. § 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 C.F.R. § 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 C.F.R. § 122.41(n)(3)):

   a. An upset occurred and that the Discharger can identify the cause(s) of the upset (40 C.F.R. § 122.41(n)(3)(i));

   b. The permitted facility was, at the time, being properly operated (40 C.F.R. § 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 C.F.R. § 122.41(n)(3)(iii)); and

   d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above. (40 C.F.R. § 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 C.F.R. § 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 C.F.R. § 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 C.F.R. § 122.41(b).)

C. Transfers

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

III. STANDARD PROVISIONS – MONITORING

A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 C.F.R. § 122.41(j)(1).)

B. Monitoring results must be conducted according to test procedures approved under 40 C.F.R. part 136 for the analyses of pollutants unless another method is required under 40 C.F.R. subchapters N or O. In the case of pollutants for which there are no approved methods under 40 C.F.R. part 136 or otherwise required under 40 C.F.R. subchapters N or O, monitoring must be conducted according to a test procedure specified in this Order for such pollutants. (40 C.F.R. § 122.41(j)(4); 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 five years (or longer as required by 40 C.F.R. 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 Central Valley Water Board Executive Officer at any time. (40 C.F.R. § 122.41(j)(2).)

B. Records of monitoring information shall include:

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

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

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

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the Central Valley Water Board, State Water Board, or U.S. EPA within a reasonable time, any information which the Central Valley Water Board, State Water Board, or U.S. EPA 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 Central Valley Water Board, State Water Board, or U.S. EPA copies of records required to be kept by this Order. (40 C.F.R. § 122.41(h); Wat. Code, §§ 13267, 13383.)

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Central Valley Water Board, State Water Board, and/or U.S. EPA 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 C.F.R. § 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 U.S. EPA). (40 C.F.R. § 122.22(a)(3).).
3. All reports required by this Order and other information requested by the Central Valley Water Board, State Water Board, or U.S. EPA 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 C.F.R. § 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 C.F.R. § 122.22(b)(2)); and
    c. The written authorization is submitted to the Central Valley Water Board and State Water Board. (40 C.F.R. § 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 Central Valley Water Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 C.F.R. § 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 C.F.R. § 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 C.F.R. § 122.41(l)(4).)
2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Central Valley Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. (40 C.F.R. § 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 C.F.R. part 136, or another method required for an industry-specific waste stream under 40 C.F.R. subchapters N or O, the results of such monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Central Valley Water Board. (40 C.F.R. § 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 C.F.R. § 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 C.F.R. § 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 C.F.R. § 122.41(l)(6)(i).)
2. The following shall be included as information that must be reported within 24 hours under this paragraph (40 C.F.R. § 122.41(l)(6)(ii)):
    a. Any unanticipated bypass that exceeds any effluent limitation in this Order. (40 C.F.R. § 122.41(l)(6)(ii)(A).)
    b. Any upset that exceeds any effluent limitation in this Order. (40 C.F.R. § 122.41(l)(6)(ii)(B).)
3. The Central Valley 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 C.F.R. § 122.41(l)(6)(iii).)

F. Planned Changes

The Discharger shall give notice to the Central Valley 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 C.F.R. § 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 section 122.29(b) (40 C.F.R. § 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 not subject to effluent limitations in this Order. (40 C.F.R. § 122.41(l)(1)(ii).)

G. Anticipated Noncompliance

The Discharger shall give advance notice to the Central Valley Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with this Order's requirements. (40 C.F.R. § 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 C.F.R. § 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 Central Valley Water Board**,** State Water Board, or U.S. EPA, the Discharger shall promptly submit such facts or information. (40 C.F.R. § 122.41(l)(8).)

VI. STANDARD PROVISIONS – ENFORCEMENT

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

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Publicly-Owned Treatment Works (POTW's)

All POTW's shall provide adequate notice to the Central Valley Water Board of the following (40 C.F.R. § 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 C.F.R. § 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 C.F.R. § 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 C.F.R. § 122.42(b)(3).)

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ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations (40 C.F.R. § 122.48) requires that all NPDES permits specify monitoring and reporting requirements. Water Code sections 13267 and 13383 also authorize the Central Valley Water Board to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements that implement federal and California regulations.

I. GENERAL MONITORING PROVISIONS

A. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring locations specified below and, unless otherwise specified, before the monitored flow joins or is diluted by any other waste stream, body of water, or substance. Monitoring locations shall not be changed without notification to and the approval of the Central Valley Water Board.

B. Effluent samples shall be taken downstream of the last addition of wastes to the treatment or discharge works where a representative sample may be obtained prior to mixing with the receiving waters. Samples shall be collected at such a point and in such a manner to ensure a representative sample of the discharge.

C. Chemical, bacteriological, and bioassay analyses of any material required by this Order shall be conducted by a laboratory certified for such analyses by the State Water Resources Control Board (State Water Board), Division of Drinking Water (DDW; formerly the Department of Public Health). 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, dissolved oxygen (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.

D. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary, at least yearly, to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year to ensure continued accuracy of the devices.

E. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this Monitoring and Reporting Program.

F. Laboratories analyzing monitoring samples shall be certified by DDW, in accordance with the provision of Water Code section 13176, and must include quality assurance/quality control data with their reports.

G. The Discharger shall ensure that the results of the Discharge Monitoring Report-Quality Assurance (DMR-QA) Study or the most recent Water Pollution Performance Evaluation Study are submitted annually to the State Water Resources Control Board at the following address:

State Water Resources Control Board Quality Assurance Program Officer
Office of Information Management and Analysis
State Water Resources Control Board
1001 I Street, Sacramento, CA 95814

H. The Discharger shall file with the Central Valley Water Board technical reports on self-monitoring performed according to the detailed specifications contained in this Monitoring and Reporting Program.

I. The results of all monitoring required by this Order shall be reported to the Central Valley Water Board, and shall be submitted in such a format as to allow direct comparison with the limitations and requirements of this Order. Unless otherwise specified, discharge flows shall be reported in terms of the monthly average and the daily maximum discharge flows.

II. MONITORING LOCATIONS

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

Table E-1. Monitoring Station Locations

Discharge Point Name	Monitoring Location Name	Monitoring Location Description
--	INF-001	Location where a representative sample of the Facility's influent (to headworks) can be obtained.
--	INF-002	Location where representative sample of the Facility's influent pump station discharge to equalization basin can be obtained.
001	EFF-001	Location where a representative sample of the Facility's effluent can be obtained. Latitude: 40.49876° Longitude: -122.36024°
--	INT-001	Location where representative sample of the Facility's centrifuge(s) centrate can be obtained.
--	RSW-001	Located in the Sacramento River 200 feet upstream of Discharge Point 001. Latitude: 40.4992° Longitude: -122.3608°
--	RSW-002	Located in the Sacramento River 300 feet downstream of Discharge Point 001. Latitude: 40.4984° Longitude: -122.3591°
--	GW-001	Monitoring Well 001 – Located between Pond 2 and 4
--	GW-003	Monitoring Well 003 – Located between WWTP and Pond 1
--	GW-005	Monitoring Well 005 – Located between Pond 3B and 5A
--	GW-008	Monitoring Well 008 – Located between Pond 2, 3B, 4, and 5B
--	GW-009	Monitoring Well 009 – Located adjacent to Pond 6 near effluent outfall.
--	GW-011	Monitoring Well 011 – Located adjacent to Biosolids Handling Building (Upgradient Well)
--	PND-002	Pond 2 – Emergency Storage
--	PND-003a	Pond 3a – Emergency Storage
--	PND-003b	Pond 3b – Emergency Storage
--	PND-004	Pond 4 – Emergency Storage
--	PND-006	Pond 6 – Emergency Storage
--	PND-007	Pond 7 – Emergency Storage
--	PND-008	Pond 8 – Emergency Storage
--	PND-009	Pond 9 – Emergency Storage

--	PND-010	Pond 10 – Emergency Storage
--	BIO-001	Location for sampling dewatered biosolids
--	SPL-001	Location where a representative sample of the municipal supply water can be obtained. If this is impractical, water quality data provided by the water supplier(s) may be used.

The North latitude and West longitude information in Table E-1 are approximate for administrative purposes.

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Location INF-001

1. 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	Continuous	--
pH	standard units	Meter [2]	Continuous	[1]
Biochemical Oxygen Demand(5-day @ 20°C)	mg/L	24-hr Composite [3]	1/Week	[1]
	lbs/day			
Total Suspended Solids	mg/L	24-hr Composite [3]	1/Week	[1]
	Lbs/day			
Hardness, Total (as $CaCO_3$)	mg/L	24-hr Composite [3]	1/Quarter	[1]
Total Recoverable Metals[4]	µg/L	24-hr Composite [3]	1/Quarter	[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 to be collected every 30 minutes whenever the continuous pH meter is offline for 30 minutes or longer.
[3] 24-hour flow proportional composite.
[4] Cadmium, copper, lead, nickel, silver, and zinc. Influent hardness and pH shall be determined at the same time. Samples shall be collected at the same time effluent sample is collected for metals analysis.

B. Monitoring Location INF-002

1. The Discharger shall monitor daily influent flow (MGD) to the Facility at INF-002.

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF-001

1. The Discharger shall monitor effluent at Monitoring Location 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	Required Analytical Test Method
Flow	MGD	Meter	Continuous	--
Conventional Pollutants				
Biochemical Oxygen Demand (5-day @ 20° C)	mg/L	24-hr Composite [2]	1/Week	[1]
	lbs/day	Calculate	1/Week	--
Total Suspended Solids	mg/L	24-hr Composite [2]	1/Week	[1]
	lbs/day	Calculate	1/Week	--
pH	standard units	Meter[12]	Continuous [3, 4]	[1]
Priority Pollutants				
Chlorodibromomethane	µg/L	Grab	1/Month	[1, 5]
Copper, Total Recoverable	µg/L	24-hr Composite [2]	1/Month	[1, 5]
Dichlorobromomethane	µg/L	Grab	1/Month	[1, 5]
Zinc, Total Recoverable	µg/L	24-hr Composite [2]	1/Month	[1, 5]
Priority Pollutants and Other Constituents of Concern	See Section IX.E	See Section IX.E	See Section IX.E	[1, 5]
Non-Conventional Pollutants				
Ammonia Nitrogen, Total (as N)	mg/L	24-hr Composite[2]	2/Week [3, 7]	[1]
Chlorine, Total Residual	mg/L	Meter	Continuous	[1, 8]
Chlorpyrifos	µg/L	Grab	1/Year	[1, 6]
Diazinon	µg/L	Grab	1/Year	[6]
Electrical Conductivity @ 25°C	µmhos/cm	24-hr Composite [2]	1/Month	[1]
Hardness, Total (as $CaCO_3$)	mg/L	24-hr Composite [2]	1/Month [9]	[1]
Nitrate Nitrogen, Total (as N)	mg/L	24-hr Composite [2]	1/Week [10]	[1]
Nitrite Nitrogen, Total (as N)	mg/L	24-hr Composite [2]	1/Week [10]	[1]
Nitrate + Nitrite (as N)	mg/L	Calculate	1/Week	--
Standard Minerals[11]	mg/L	24-hr Composite [2]	1/Year	[1]
Temperature	°F	Meter	Continuous [4]	[1]
Total Coliform Organisms	MPN/100 mL	Grab	2/Week	[1]
Total Dissolved Solids	mg/L	24-hr Composite [2]	1/Month	[1]
Other				
Whole Effluent Toxicity (see Section V. below)	--	--	--	--

[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] 24-hour flow-proportional composite.

[3] pH and temperature shall be recorded at the time of ammonia sample collection.

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

[5] For priority pollutant constituents the reporting level shall be consistent with Sections 2.4.2 and 2.4.3 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (See Attachment E, Table E-10).

[6] US EPA Method 625M, Method 8141, or equivalent. Minimum reporting limits: <100 ng/L diazinon; <15 ng/L chlorpyrifos.

[7] Concurrent with whole effluent toxicity monitoring

[8] Total chlorine residual must be monitored with a method sensitive to and accurate at the permitted level of 0.01 mg/L.

[9] Hardness samples shall be collected concurrently with metals samples.

[10] Monitoring for nitrite and nitrate shall be conducted concurrently.

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

[12] Grab samples to be collected every 30 minutes whenever the continuous pH meter is offline for 30 minutes or longer.

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 shall use flow-through testing. If the flow-through bioassay is not available for use, static renewal testing may be used. For static renewal testing, the samples shall be flow proportional 24-hour composites and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at 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 semi-annual (twice per year) three species chronic toxicity testing. The Discharger shall offset the chronic toxicity testing from the acute toxicity testing such that the WET testing will occur on six different occasions through any given year (four acute toxicity tests and 2 chronic toxicity tests).
2. *Sample Types* – Effluent samples shall be flow proportional 24-hour composites and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at Monitoring Location EFF-001. The receiving water samples shall be grab samples obtained from Monitoring Locations RSW-001, 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:
   a. The cladoceran, water flea, *Ceriodaphnia dubia* (survival and reproduction test);
   b. The fathead minnow, *Pimephales promelas* (larval survival and growth test); and
   c. The green alga, *Selenastrum capricornutum* (growth test).
5. Methods – The presence of chronic toxicity shall be estimated as specified in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition*, EPA/821-R-02-013, October 2002.

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

7. *Dilutions* –The chronic toxicity testing shall be performed using the dilution series identified in Table E-4, below. For accelerated monitoring and TRE monitoring, the chronic toxicity testing shall be performed using the dilution series identified in Table E-4, below, unless an alternative dilution series is detailed in the submitted TRE Action Plan. A receiving water control or laboratory water control may be used as the diluent.

Table E-4. Chronic Toxicity Testing Dilution Series

Sample	Dilutions[a] (%)					Control
	100	75	50	25	12.5	
% Effluent	100	75	50	25	12.5	0
% Control Water	0	25	50	75	87.5	100

[a] Receiving water control or laboratory water control may be used as the diluent.

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

   a. The reference toxicant test or the effluent test does not meet all test acceptability criteria as specified in the *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition*, EPA/821-R-02-013, October 2002 (Method Manual), and its subsequent amendments or revisions; or

   b. The percent minimum significant difference (PMSD) measured for the test exceeds the upper PMSD bound variability criterion in Table 6 on page 52 of the Method Manual. (A retest is only required in this case if the test results do not exceed the monitoring trigger specified in the Special Provision at section VI. 2.a.iii. of the Order.)

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

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

1. **Chronic WET Reporting.** Regular chronic toxicity monitoring results shall be reported to the Central Valley Water Board with the semi-annual self-monitoring report and shall contain, at minimum:

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

2. **Acute WET Reporting.** Acute toxicity test results shall be submitted with the quarterly 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 – NOT APPLICABLE

VII. RECYCLING MONITORING REQUIREMENTS – NOT APPLICABLE

VIII. RECEIVING WATER MONITORING REQUIREMENTS

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-5. Receiving Water Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow[1]	cfs	Gauge[4]	1/Day	--
Conventional Pollutants				
pH	standard units	Grab	1/Week	[2]
Priority Pollutants				
Chlorodibromomethane	µg/L	Grab	1/Year[1]	[2]
Copper, Dissolved	µg/L	Grab	1/Month[1,3]	[2]
Copper, Total Recoverable	µg/L	Grab	1/Month[1,3]	[2]
Dichlorobromomethane	µg/L	Grab	1/Year[1]	[2]
Zinc, Dissolved	µg/L	Grab	1/Month[1,3]	[2]
Zinc, Total Recoverable	µg/L	Grab	1/Month[1,3]	[2]

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Priority Pollutants and Other Constituents of Concern	See Section IX.E	See Section IX.E	See Section IX.E	[1, 5]
Non-Conventional Pollutants				
Dissolved Oxygen	mg/L	Grab	1/Week	[2]
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/Month	[2]
Hardness, Total (as $CaCO_3$)	mg/L	Grab	1/Month[3]	[2]
Temperature	°F	Grab	1/Week	[2]
Total Dissolved Solids	mg/L	Grab	1/Quarter	[2]
Turbidity	NTU	Grab	1/Week	[2]
Nitrate (as N)	mg/L	Grab	1/Quarter[1]	[2]
Nitrite (as N)	mg/L	Grab	1/Quarter[1]	[2]
Chlorpyrifos	µg/L	Grab	1/Year[6]	[1, 5]
Diazinon	µg/L	Grab	1/Year[6]	[5]

[1] Monitoring required at Monitoring Location RSW-001 only.
[2] Pollutants shall be analyzed using the analytical methods described in 40 C.F.R. part 136 or by methods requested by the Discharger that have been approved by the Central Valley Water Board or the State Water Board.
[3] Hardness shall be sampled at the time of copper and zinc sample collection.
[4] The location and/or source of the gauge(s) must be approved by the Executive Officer.
[5] US EPA Method 625M, Method 8141, or equivalent. Minimum reporting limits: <100 ng/L diazinon; <15 ng/L chlorpyrifos.
[6] Monitoring required during third and fourth year of permit and shall be conducted concurrently as effluent sampling for chlorpyrifos and diazinon.

2. In conducting the receiving water sampling when discharging to the Sacramento River at Discharge Point No. 001, a log shall be kept of the receiving water conditions throughout the reach bounded by Monitoring Locations RSW-001 and RSW-002. Attention shall be given to the presence or absence of:

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

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

B. Monitoring Location GW-001, GW-003, GW-005, GW-008, GW-009, and GW-011

1. Prior to construction and/or beginning a sampling program of any new groundwater monitoring wells, the Discharger shall submit plans and specifications to the Central Valley Water Board for approval. Once installed, all new wells shall be added to the monitoring network (existing monitoring wells at the Facility include: Monitoring Well Nos. -001, -002, -003, -004, -005, -006, -007, -008, -009, -010, -011, -012, and -013) and shall be sampled and analyzed according to the schedule below. All samples shall be collected using approved EPA methods. Water table elevations shall be calculated to determine groundwater gradient and direction of flow.

2. Prior to sampling, the groundwater elevations shall be measured and the wells shall be purged of at least three well volumes until temperature, pH, and electrical conductivity

have stabilized. Depth to groundwater shall be measured to the nearest 0.01 feet. Groundwater monitoring at GW-001, GW-003, GW-005, GW-008, GW-009, and GW-011 shall include, at a minimum, the following:

Table E-6. Groundwater Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Depth to Groundwater	±0.01 feet	Measurement	2/Year	--
Groundwater Elevation [1]	±0.01 feet	Calculated	2/Year	--
Gradient	feet/feet	Calculated	2/Year	--
Gradient Direction	degrees	Calculated	2/Year	--
Electrical Conductivity @ 25°C	µmhos/cm	Grab	2/Year	[2]
Total Dissolved Solids	mg/L	Grab	2/Year	[2]
pH	standard units	Grab	2/Year	[2]
Total Coliform Organisms	MPN/100 mL	Grab	2/Year	[2]
Fecal Coliform Organisms	MPN/100 mL	Grab	2/Year	[2]
Total Nitrogen	mg/L	Grab	2/Year	[2]
Nitrate Nitrogen, Total (as N)	mg/L	Grab	2/Year	[2]
Ammonia (as NH4)	mg/L	Grab	2/Year	[2]
Total Kjeldahl Nitrogen	mg/L	Grab	2/Year	[2]
Arsenic, Total and Dissolved	µg/L	Grab	2/Year	[2]
Iron, Total and Dissolved	µg/L	Grab	2/Year	[2]
Manganese, Total and Dissolved	µg/L	Grab	2/Year	[2]
Standard Minerals [3]	µg/L	Grab	1/Year	[2]

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

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

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

IX. OTHER MONITORING REQUIREMENTS

A. Biosolids

1. Monitoring Location BIO-001

a. A composite sample of biosolids shall be collected 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 C.F.R. part 122, Appendix D, Tables II and III (excluding total phenols) **annually**.

b. Biosolids monitoring shall be conducted using the methods in Test Methods for Evaluating Solid Waste, Physical/Chemical methods (EPA publication SW-846), as required in 40 C.F.R. section 503.8(b)(4). All results must be reported on a 100% dry weight basis. Records of all analyses must state on each page of the laboratory report whether the results are expressed in “100% dry weight” or “as is.”

c. Sampling records shall be retained for a minimum of **5 years**. A log shall be maintained of biosolids 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.

B. Municipal Water Supply

1. Monitoring Location SPL-001

a. The Discharger shall monitor the municipal water supply at SPL-001 as follows:

Table E-7. 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	[2]
Electrical Conductivity @ 25°C[1]	µmhos/cm	Grab	1/Year	[2]
Standard Minerals[3]	mg/L	Grab	1/Year	[2]

[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] Pollutants shall be analyzed using the analytical methods described in 40 C.F.R. part 136 or by methods approved by the Central Valley Water Board or the State Water Board.

[3] Standard minerals shall include all major cations and anions and include verification that the analysis is complete (i.e., cation/anion balance).

C. Pond Monitoring

1. Pond Monitoring Location PND-002, PND-003a, PND-003b, PND-004, PND-006, PND-007, PND-008, PND-009, PND-010

The Discharger shall monitor the Facility Ponds, when in use, at PND-002, PND-003a, PND-003b, PND-004, PND-006, PND-007, PND-008, PND-009, PND-010 as follows.

Table E-8. Pond Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Dissolved Oxygen	mg/L	Grab	1/Week	[1]
Freeboard	feet	Measure	1/Week	--
Levee Condition	--	Observation	1/Week	--
Odors	--	Observation	1/Week	--

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

D. Internal Monitoring

1. Internal Monitoring Location INT-001

a. The Discharger shall monitor the discharge of centrifuge centrate to Pond 5A and 5B during the first year of the permit as follows:

Table E-9. Centrifuge Centrate Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Ammonia Nitrogen, Total	mg/L	Grab	1/Month	[1]
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/Month	[1]
Nitrate	mg/L	Grab	1/Month	[1]
pH	Standard units	Grab	1/Month	[1]

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

E. Effluent and Receiving Water Characterization

1. **Quarterly Monitoring. Quarterly** samples shall be collected from the effluent and upstream receiving water (Monitoring Locations EFF-001 and RSW-001) and analyzed for the constituents listed in Table E-10, below. Quarterly monitoring shall be conducted during **2020** (4 consecutive samples, evenly distributed throughout the year) and the results of such monitoring be submitted to the Central Valley Water Board with the monthly self-monitoring reports. Each individual monitoring event shall provide representative sample results for the effluent and upstream receiving water.

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

3. **Sample Type.** All receiving water samples shall be taken as grab samples. Effluent samples shall be taken as described in Table E-10, below. Composite samples shall be flow proportional 24-hour composites and shall be representative of the volume and quality of the discharge.

Table E-10. Effluent and Receiving Water Characterization Monitoring[4]

CTR No.	Parameter	Units	Effluent Sample Type	Maximum Reporting Level[1]
	VOLATILE ORGANICS			
25	2-Chloroethyl vinyl ether	µg/L	Grab	1
17	Acrolein	µg/L	Grab	2
18	Acrylonitrile	µg/L	Grab	2
19	Benzene	µg/L	Grab	0.5
20	Bromoform[5]	µg/L	Grab	0.5
21	Carbon Tetrachloride	µg/L	Grab	0.5
22	Chlorobenzene	µg/L	Grab	0.5
24	Chloroethane	µg/L	Grab	0.5
26	Chloroform[5]	µg/L	Grab	2
35	Chloromethane (aka Methyl Chloride)	µg/L	Grab	2
23	Dibromochloromethane[5]	µg/L	Grab	0.5
27	Dichlorobromomethane[5]	µg/L	Grab	0.5
36	Dichloromethane (aka Methylene Chloride)	µg/L	Grab	2
33	Ethylbenzene	µg/L	Grab	2
88	Hexachlorobenzene	µg/L	Grab	1
89	Hexachlorobutadiene	µg/L	Grab	1
91	Hexachloroethane	µg/L	Grab	1
34	Methyl bromide (Bromomethane)	µg/L	Grab	1
94	Naphthalene	µg/L	Grab	10
38	Tetrachloroethene (PCE)	µg/L	Grab	0.5
39	Toluene	µg/L	Grab	2
40	trans-1,2-Dichloroethylene	µg/L	Grab	1
43	Trichloroethene (TCE)	µg/L	Grab	2
44	Vinyl chloride	µg/L	Grab	0.5
	Methyl-tert-butyl ether (MTBE)	µg/L	Grab	--
	Trichlorofluoromethane (Freon 11)	µg/L	Grab	--
41	1,1,1-Trichloroethane	µg/L	Grab	0.5
42	1,1,2- Trichloroethane	µg/L	Grab	0.5
28	1,1-dichloroethane	µg/L	Grab	0.5
30	1,1-dichloroethylene	µg/L	Grab	0.5
31	1,2-dichloropropane	µg/L	Grab	0.5

CTR No.	Parameter	Units	Effluent Sample Type	Maximum Reporting Level[1]
32	1,3-dichloropropylene	µg/L	Grab	0.5
37	1,1,2,2-tetrachloroethane	µg/L	Grab	0.5
	1,1,2-Trichloro-1,2,2-Trifluoroethane (Freon 13)	µg/L	Grab	0.5
101	1,2,4-trichlorobenzene	µg/L	Grab	1
29	1,2-dichloroethane	µg/L	Grab	0.5
75	1,2-dichlorobenzene	µg/L	Grab	0.5
76	1,3-dichlorobenzene	µg/L	Grab	0.5
77	1,4-dichlorobenzene	µg/L	Grab	0.5
	Styrene	µg/L	Grab	--
	Xylenes	µg/L	Grab	--
	SEMI-VOLATILE ORGANICS			
60	1,2-Benzanthracene (a.k.a. Benzo(a)anthracene)	µg/L	Grab	5
85	1,2-Diphenylhydrazine	µg/L	Grab	1
45	2-Chlorophenol	µg/L	Grab	5
46	2,4-Dichlorophenol	µg/L	Grab	5
47	2,4-Dimethylphenol	µg/L	Grab	2
49	2,4-Dinitrophenol	µg/L	Grab	5
82	2,4-Dinitrotoluene	µg/L	Grab	5
55	2,4,6-Trichlorophenol	µg/L	Grab	10
83	2,6-Dinitrotoluene	µg/L	Grab	5
50	2-Nitrophenol	µg/L	Grab	10
71	2-Chloronaphthalene	µg/L	Grab	10
78	3,3'-Dichlorobenzidine	µg/L	Grab	5
62	3,4-Benzofluoranthene (a.k.a. Benzo(b)fluoranthene)	µg/L	Grab	10
52	4-Chloro-3-methylphenol	µg/L	Grab	5
48	4,6-Dinitro-2-methylphenol	µg/L	Grab	10
51	4-Nitrophenol	µg/L	Grab	10
69	4-Bromophenyl phenyl ether	µg/L	Grab	10
72	4-Chlorophenyl phenyl ether	µg/L	Grab	5
56	Acenaphthene	µg/L	Grab	1
57	Acenaphthylene	µg/L	Grab	10
58	Anthracene	µg/L	Grab	10
59	Benzidine	µg/L	Grab	5
61	Benzo(a)pyrene (3,4-Benzopyrene)	µg/L	Grab	2
63	Benzo(g,h,i)perylene	µg/L	Grab	5
64	Benzo(k)fluoranthene	µg/L	Grab	2
65	Bis(2-chloroethoxy) methane	µg/L	Grab	5
66	Bis(2-chloroethyl) ether	µg/L	Grab	1
67	Bis(2-chloroisopropyl) ether	µg/L	Grab	10
68	Bis(2-ethylhexyl) phthalate[2]	µg/L	Grab	5
70	Butyl benzyl phthalate	µg/L	Grab	10
73	Chrysene	µg/L	Grab	5
81	Di-n-butylphthalate	µg/L	Grab	10
84	Di-n-octylphthalate	µg/L	Grab	10
74	Dibenzo(a,h)-anthracene	µg/L	Grab	0.1
79	Diethyl phthalate	µg/L	Grab	10
80	Dimethyl phthalate	µg/L	Grab	10
86	Fluoranthene	µg/L	Grab	10
87	Fluorene	µg/L	Grab	10
90	Hexachlorocyclopentadiene	µg/L	Grab	5
92	Indeno(1,2,3-c,d)pyrene	µg/L	Grab	0.05
93	Isophorone	µg/L	Grab	1
98	N-Nitrosodiphenylamine	µg/L	Grab	1

CTR No.	Parameter	Units	Effluent Sample Type	Maximum Reporting Level[1]
96	N-Nitrosodimethylamine	µg/L	Grab	5
97	N-Nitrosodi-n-propylamine	µg/L	Grab	5
95	Nitrobenzene	µg/L	Grab	10
53	Pentachlorophenol	µg/L	Grab	1
99	Phenanthrene	µg/L	Grab	5
54	Phenol	µg/L	Grab	1
100	Pyrene	µg/L	Grab	10
	INORGANICS			
	Aluminum	µg/L	24-hr Composite[3]	--
1	Antimony	µg/L	24-hr Composite[3]	5
2	Arsenic	µg/L	24-hr Composite[3]	2
15	Asbestos	MFL	24-hr Composite[3]	--
	Barium	µg/L	24-hr Composite[3]	--
3	Beryllium	µg/L	24-hr Composite[3]	2
4	Cadmium	µg/L	24-hr Composite[3]	0.25
5a (Cr III)	Chromium (Total)	µg/L	24-hr Composite[3]	10
5b	Chromium (VI)	µg/L	24-hr Composite[3]	10
6	Copper	µg/L	24-hr Composite[3]	0.5
	Iron	µg/L	24-hr Composite[3]	--
7	Lead	µg/L	24-hr Composite[3]	0.5
8	Mercury	µg/L	24-hr Composite[3]	0.2
	Manganese	µg/L	24-hr Composite[3]	--
	Molybdenum	µg/L	24-hr Composite[3]	--
9	Nickel	µg/L	24-hr Composite[3]	20
10	Selenium	µg/L	24-hr Composite[3]	2
11	Silver	µg/L	24-hr Composite[3]	0.25
12	Thallium	µg/L	24-hr Composite[3]	1
13	Zinc	µg/L	24-hr Composite[3]	10
	NON-METALS/MINERALS			
	Boron	µg/L	24-hr Composite[3]	--
	Chloride	mg/L	24-hr Composite[3]	--
14	Cyanide	µg/L	24-hr Composite[3]	5
	Fluoride	µg/L	24-hr Composite[3]	--
	Phosphorus, Total (as P)	mg/L	24-hr Composite[3]	--
	Sulfate	mg/L	Grab	--
	Sulfide (as S)	mg/L	Grab	--
	Sulfite (as SO_3)	mg/L	Grab	--
	PESTICIDES/PCBs/DIOXINS			
110	4,4'-DDD	µg/L	24-hr Composite[3]	0.05
109	4,4'-DDE	µg/L	24-hr Composite[3]	0.05
108	4,4'-DDT	µg/L	24-hr Composite[3]	0.01
112	alpha-Endosulfan	µg/L	24-hr Composite[3]	0.02
103	alpha-Hexachlorocyclohexane (BHC)	µg/L	24-hr Composite[3]	0.01
	Alachlor	µg/L	24-hr Composite[3]	
102	Aldrin	µg/L	24-hr Composite[3]	0.005
113	beta-Endosulfan	µg/L	24-hr Composite[3]	0.01
104	beta-Hexachlorocyclohexane (BHC)	µg/L	24-hr Composite[3]	0.005
107	Chlordane	µg/L	24-hr Composite[3]	0.1
106	delta-Hexachlorocyclohexane (BHC)	µg/L	24-hr Composite[3]	0.005
111	Dieldrin	µg/L	24-hr Composite[3]	0.01
114	Endosulfan sulfate	µg/L	24-hr Composite[3]	0.01
115	Endrin	µg/L	24-hr Composite[3]	0.01
116	Endrin Aldehyde	µg/L	24-hr Composite[3]	0.01
117	Heptachlor	µg/L	24-hr Composite[3]	0.01
118	Heptachlor Epoxide	µg/L	24-hr Composite[3]	0.02

CTR No.	Parameter	Units	Effluent Sample Type	Maximum Reporting Level[1]
105	Lindane (gamma-Hexachlorocyclohexane)	µg/L	24-hr Composite[3]	0.5
119	PCB-1016	µg/L	24-hr Composite[3]	0.5
120	PCB-1221	µg/L	24-hr Composite[3]	0.5
121	PCB-1232	µg/L	24-hr Composite[3]	0.5
122	PCB-1242	µg/L	24-hr Composite[3]	0.5
123	PCB-1248	µg/L	24-hr Composite[3]	0.5
124	PCB-1254	µg/L	24-hr Composite[3]	0.5
125	PCB-1260	µg/L	24-hr Composite[3]	0.5
126	Toxaphene	µg/L	24-hr Composite[3]	--
	Atrazine	µg/L	24-hr Composite[3]	--
	2,4-D (2,4-Dichlorophenoxyacetic acid)	µg/L	24-hr Composite[3]	--
	Carbofuran	µg/L	24-hr Composite[3]	--
	Carbaryl	µg/L	24-hr Composite[3]	
	Gylphosate	µg/L	24-hr Composite[3]	
	Simazine (Princep)	µg/L	24-hr Composite[3]	--
	Thiobencarb	µg/L	24-hr Composite[3]	--
16	2,3,7,8-TCDD (Dioxin)	µg/L	24-hr Composite[3]	--
	CONVENTIONAL PARAMETERS			
	pH	Std Units	Grab	--
	Temperature	^{o}C	Grab	--
	NONCONVENTIONAL PARAMETERS			
	Hardness (as CaCO3)	mg/L	Grab	--
	Foaming Agents (methylene blue active substances)	µg/L	24-hr Composite[3]	--
	Mercury, Methyl	ng/L	Grab	--
	NUTRIENTS			
	Ammonia (as N)	mg/L	24-hr Composite[3]	--
	Nitrate (as N)	mg/L	24-hr Composite[3]	--
	Nitrite (as N)	mg/L	24-hr Composite[3]	--

[1] The reporting levels required in this table for priority pollutant constituents are established based on section 2.4.2 and Appendix 4 of the SIP.

[2] In order to verify if bis (2-ethylhexyl) phthalate is truly present, the Discharger shall take steps to assure that sample containers, sampling apparatus, and analytical equipment are not sources of the detected contaminant.

[3] 24-hour flow proportional composite.

[4] The Discharger is not required to conduct effluent or receiving water monitoring for constituents that have already been sampled in a given month, as required in Table E-3 and/or Table E-5, except for hardness, pH, and temperature, which shall be conducted concurrently with the effluent sampling.

[5] Bromoform and chloroform sampling shall be conducted concurrently with chlorodibromomethane and dichlorobromomethane for assessment of total trihalomethanes (TTHM) concentration.

X. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

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

2. Upon written request of the Central Valley Water Board, the Discharger shall submit a summary monitoring report. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year(s).

3. **Compliance Time Schedules.** For compliance time schedules included in the Order, the Discharger shall submit to the Central Valley Water Board, on or before each compliance due date, the specified document or a written report detailing compliance or

noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board by letter when it returns to compliance with the compliance time schedule.

4. The Discharger shall report to the Central Valley Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "*Emergency Planning and Community Right to Know Act*" of 1986.

B. Self-Monitoring Reports (SMRs)

1. The Discharger shall electronically submit SMRs using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). The CIWQS Web site will provide additional information for SMR submittal in the event there will be a planned service interruption for electronic submittal.

2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under sections III through IX. The Discharger shall submit monthly, quarterly, semiannual, and annual SMRs including the results of all required monitoring using U.S. EPA-approved test methods or other test methods specified in this Order. SMRs are to include all new monitoring results obtained since the last SMR was submitted. 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-11. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period	SMR Due Date
Continuous	Permit effective date	All	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	1st day of calendar month through last day of calendar month	First day of second calendar month following month of sampling
1/Quarter	Permit effective date	1 January through 31 March 1 April through 30 June 1 July through 30 September 1 October through 31 December	1 May 1 August 1 November 1 February of following year
2/Year	Permit effective date	1 January through 30 June	1 August

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period	SMR Due Date
		1 July through 31 December	1 February of following year
1/Year	Permit effective date	1 January through 31 December	1 February of following year

4. **Reporting Protocols.** The Discharger shall report with each sample result the applicable Reporting Level (RL) and the current laboratory's Method Detection Limit (MDL), as determined by the procedure in 40 C.F.R. 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. The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (± a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

   c. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.

   d. Dischargers are to instruct laboratories to establish calibration standards so that the Minimum Level (ML) value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve.

5. **Multiple Sample Data.** When determining compliance with an AMEL, AWEL, or MDEL for priority pollutants and more than one sample result is available, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of "Detected, but Not Quantified" (DNQ) or "Not Detected" (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, ranking the 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.

6. 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 WDR's; 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. The Discharger shall attach all laboratory analysis sheets, including quality assurance/quality control information, with all its SMRs for which sample analyses were performed.

7. The Discharger shall submit in the SMRs calculations and reports in accordance with the following requirements:

   a. **Mass Loading Limitations**. For BOD_5, 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:

      Mass Loading (lbs/day) = Flow (MGD) x Concentration (mg/L) x 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.

   b. **Removal Efficiency (BOD_5 and TSS).** The Discharger shall calculate and report the percent removal of BOD_5 and TSS in the SMRs. The percent removal shall be calculated as specified in Section VII.A. of the Limitations and Discharge Requirements.

   c. **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.

   d. **Dissolved Oxygen Receiving Water Limitations**. The Discharger shall report monthly in the self-monitoring report the dissolved oxygen concentrations in the effluent (EFF-001) and the receiving water (RSW-001 and RSW-002).

   e. **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.17.a-e. of the Limitations and Discharge Requirements.

   f. **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.

C. Discharge Monitoring Reports (DMR's)

1. The Discharger shall electronically submit DMR's together with SMR's using Electronic Self-Monitoring Reports module eSMR 2.5 or any upgraded version. Electronic submittal of DMR's will be in addition to electronic submittal of SMRs. Information about electronic submittal of DMR's is provided by the Discharge Monitoring Report website as follows: (http://www.waterboards.ca.gov/water_issues/programs/discharge_monitoring/).

D. Other Reports

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

2. Within 60 days of permit adoption, the Discharger shall submit a report outlining reporting levels (RL's), method detection limits (MDL's), and analytical methods for the constituents listed in tables E-2, E-3, E-5, E-6, E-7, and E-9. In addition, no less than 6 months prior to conducting the effluent and receiving water characterization monitoring required in Section IX.D, the Discharger shall submit a report outlining RL's, MDL's, and analytical methods for the constituents listed in Table E-10. 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 (ML's) 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 RL's, 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 E-10 provides required maximum reporting levels in accordance with the SIP.

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

   a. The names, certificate grades, and general responsibilities of all persons employed at the Facility.

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

   c. A statement certifying when the flow meter(s) and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration.

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

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

report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

4. **Annual Pretreatment Reporting Requirements**. The Discharger shall submit annually a report to the Central Valley Water Board, with copies to USEPA Region 9 and the State Water Board, describing the Discharger's pretreatment activities over the previous 12 months (1 January through 31 December). In the event that the Discharger is not in compliance with any conditions or requirements of this Order, including noncompliance with pretreatment audit/compliance inspection requirements, then the Discharger shall also include the reasons for noncompliance and state how and when the Discharger shall comply with such conditions and requirements.

   An annual report shall be submitted by **28 February** and include at least the following items:

   a. A summary of analytical results from representative, flow proportioned, 24-hour composite sampling of the POTW's influent and effluent for those pollutants USEPA has identified under section 307(a) of the CWA which are known or suspected to be discharged by nondomestic users. This will consist of an annual full priority pollutant scan. The Discharger is not required to sample and analyze for asbestos. The Discharger shall submit the results of the annual priority pollutant scan electronically to the Central Valley Water Board using the State Water Board's CIWQS Program Website.

      Biosolids shall be sampled during the same 24-hour period and analyzed for the same pollutants as the influent and effluent sampling and analysis. The biosolids analyzed shall be a composite sample of a minimum of 12 discrete samples taken at equal time intervals over the 24-hour period. Wastewater and biosolids sampling and analysis shall be performed at least annually. The Discharger shall also provide any influent, effluent or biosolids monitoring data for nonpriority pollutants which may be causing or contributing to Interference, Pass-Through or adversely impacting biosolids quality. Sampling and analysis shall be performed in accordance with the techniques prescribed in 40 C.F.R. part 136 and amendments thereto.

   b. A discussion of Upset, Interference, or Pass-Through incidents, if any, at the treatment plant, which the Discharger knows or suspects were caused by nondomestic users of the POTW. The discussion shall include the reasons why the incidents occurred, the corrective actions taken and, if known, the name and address of, the nondomestic user(s) responsible. The discussion shall also include a review of the applicable pollutant limitations to determine whether any additional limitations, or changes to existing requirements, may be necessary to prevent Pass-Through, Interference, or noncompliance with sludge disposal requirements.

   c. The cumulative number of nondomestic users that the Discharger has notified regarding Baseline Monitoring Reports and the cumulative number of nondomestic user responses.

   d. An updated list of the Discharger's significant industrial users (SIUs) including their names and addresses, or a list of deletions, additions and SIU name changes keyed to a previously submitted list. The Discharger shall provide a brief explanation for each change. The list shall identify the SIUs subject to federal categorical standards by specifying which set(s) of standards are applicable to each SIU. The list shall indicate which SIUs, or specific pollutants from each industry, are subject to local

limitations. Local limitations that are more stringent than the federal categorical standards shall also be identified.

e. The Discharger shall characterize the compliance status through the year of record of each SIU by employing the following descriptions:

   i. complied with baseline monitoring report requirements (where applicable);

   ii. consistently achieved compliance;

   iii. inconsistently achieved compliance;

   iv. significantly violated applicable pretreatment requirements as defined by 40 C.F.R. section 403.8(f)(2)(vii);

   v. complied with schedule to achieve compliance (include the date final compliance is required);

   vi. did not achieve compliance and not on a compliance schedule; and

   vii. compliance status unknown.

f. A report describing the compliance status of each SIU characterized by the descriptions in items iii through vii above **shall be submitted for each calendar quarter by the first day of the second month following the end of the quarter**. The report shall identify the specific compliance status of each such SIU and shall also identify the compliance status of the POTW with regards to audit/pretreatment compliance inspection requirements. If none of the aforementioned conditions exist, at a minimum, a letter indicating that all industries are in compliance and no violations or changes to the pretreatment program have occurred during the quarter must be submitted. The information required in the fourth quarter report shall be included as part of the annual report due every 28 February. This quarterly reporting requirement shall commence upon issuance of this Order.

g. A summary of the inspection and sampling activities conducted by the Discharger during the past year to gather information and data regarding the SIUs. The summary shall include:

   i. The names and addresses of the SIUs subjected to surveillance and an explanation of whether they were inspected, sampled, or both and the frequency of these activities at each user; and

   ii. The conclusions or results from the inspection or sampling of each industrial user.

h. The Discharger shall characterize the compliance status of each SIU by providing a list or table which includes the following information:

   i. Name of SIU;

   ii. Category, if subject to federal categorical standards;

   iii. The type of wastewater treatment or control processes in place;

   iv. The number of samples taken by the POTW during the year;

   v. The number of samples taken by the SIU during the year;

   vi. For an SIU subject to discharge requirements for total toxic organics, whether all required certifications were provided;

vii. A list of the standards violated during the year. Identify whether the violations were for categorical standards or local limits.

viii. Whether the facility is in significant noncompliance (SNC) as defined at 40 C.F.R. section 403.8(f)(2)(viii) at any time during the year; and

ix. A summary of enforcement or other actions taken during the year to return the SIU to compliance. Describe the type of action (e.g., warning letters or notices of violation, administrative orders, civil actions, and criminal actions), final compliance date, and the amount of fines and penalties collected, if any. Describe any proposed actions for bringing the SIU into compliance;

x. Restriction of flow to the POTW.

xi. Disconnection from discharge to the POTW.

i. A brief description of any programs the POTW implements to reduce pollutants from nondomestic users that are not classified as SIUs;

j. A brief description of any significant changes in operating the pretreatment program which differ from the previous year including, but not limited to, changes concerning: the program's administrative structure, local limits, monitoring program or monitoring frequencies, legal authority, enforcement policy, funding levels, or staffing levels;

k. A summary of the annual pretreatment budget, including the cost of pretreatment program functions and equipment purchases; and

l. A summary of activities to involve and inform the public of the program including a copy of the newspaper notice, if any, required under 40 C.F.R. section 403.8(f)(2)(viii).

Pretreatment Program reports shall be electronically submitted to the following:

State Water Resources Control Board: NPDESWastewater@waterboards.ca.gov
EPA Regional Administrator: R9Pretreatment@epa.gov
Central Valley Water Board: centralvalleyredding@waterboards.ca.gov

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ATTACHMENT F – FACT SHEET

As described in section II.B of this Order, the Central Valley Water Board incorporates this Fact Sheet as findings of the Central Valley Water Board supporting the issuance 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	5A450103001
CIWQS Facility Place ID	214802
Discharger	City of Redding
Name of Facility	Clear Creek Wastewater Treatment Plant
Facility Address	2220 Metz Road
	Anderson, CA 96007
	Shasta County
Facility Contact, Title and Phone	Troy Mitchell, Chief Plant Operator, (530) 225-4157
Authorized Person to Sign and Submit Reports	Troy Mitchell, Chief Plant Operator, (530) 225-4157 Ryan Bailey, Wastewater Utility Manager, (530) 225-6063
Mailing Address	2220 Metz Road, Anderson, CA 96007
Billing Address	P.O. Box 496071, Redding, CA 96049
Type of Facility	Publicly-Owned Treatment Works (POTW)
Major or Minor Facility	Major
Threat to Water Quality	1
Complexity	A
Pretreatment Program	Y
Recycling Requirements	N
Facility Permitted Flow	8.8 million gallons per day (MGD) average dry weather flow (ADWF)
Facility Design Flow	9.4 MGD ADWF 40 MGD peak wet weather flow (PWWF)
Watershed	Sacramento River
Receiving Water	Sacramento River
Receiving Water Type	Inland surface water

A. The City of Redding (hereinafter Discharger) is the owner and operator of Clear Creek Wastewater Treatment Plant (hereinafter Facility), a Publicly-Owned Treatment Works (POTW).

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, within the Sacramento River Basin Watershed. The Discharger was previously regulated by Order R5-2010-0096 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA0079731 adopted on 23 September 2010 and expired on 1 September 2015. Attachment B provides a map of the area around the Facility. Attachment C provides a flow schematic of the Facility.

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. The State Water Board retains the jurisdictional authority to enforce such requirements under Water Code section 1211.

C. The Discharger filed a report of waste discharge (ROWD) and submitted an application for reissuance of its WDR's and NPDES permit on 5 March 2015. Supplemental information was requested on 16 March 2015 and received on 30 March 2015. The application was deemed complete on 16 March 2015. A site visit was conducted on 20 November 2014 and on 12 October 2016, to observe operations and collect additional data to develop permit limitations and requirements for waste discharge.

II. FACILITY DESCRIPTION

The Discharger provides sewerage service for the community of Redding and serves a population of approximately 74,000. The Discharger also provides service to Shasta County (population served 100) and the Redding Rancheria (population served 200), and three significant (non-categorical) industrial users (SIUs). The Discharger is the owner-operator of the collection system, which is regulated under the State Water Board General Order, Water Quality Order No. 2006-0003, effective November 2006. An approved pretreatment program is managed by the Discharger's Industrial Waste Division. The design daily average dry weather flow capacity of the Facility is 9.4 million gallons per day (MGD); however the permitted average dry weather flow (ADWF) remains at 8.8 MGD. The Report of Waste Discharge described observed effluent flows during 2014 as follows: annual average daily flow rate: 6.9 MGD, maximum daily flow rate: 21.1 MGD.

A. Description of Wastewater and Biosolids Treatment and Controls

The Facility is permitted to discharge up to 8.8 MGD ADWF. Liquid stream treatment processes include influent screening, grit removal, primary clarification, aeration basins, secondary clarification, filtration, and disinfection. Sludge is anaerobically digested and dewatered using a centrifuge. Dried biosolids are hauled to a landfill or applied on city-owned property near the Redding Municipal Airport as Class B biosolids. Class B biosolids application to land is regulated by Waste Discharge Requirements Order No. 5-01-226.

Influent Flow. A majority of the Facility's influent raw sewage is received by two influent pump stations, which lifts the raw sewage to the headworks facility for preliminary treatment through a 36-inch force main. The hydraulic capacity of the main line is 60 MGD. Raw sewage from the Redding Rancheria's Win-River Resort & Casino (Casino) is conveyed directly to the headworks via a 6-inch diameter force main. Flow from the influent pump stations to the headworks facility is metered and can be controlled with the Facility's supervisory control and data acquisition (SCADA) system. Influent raw sewage flow that exceeds the operational setpoint is diverted to equalization ponds (Ponds 1A and 1B) by a

control valve. The total flow entering the main treatment train can be quantified as the summation of the flow from the influent pump station to headworks and flow from the Casino.

Preliminary Treatment. The headworks consist of two micro screens, a Parshall flume, a grit chamber, and weirs for flow control and distribution. The micro screens have a hydraulic capacity of 30 MGD each. Washed screenings are compacted prior to discharge to a dumpster. Screenings and grit from the headworks are currently sent to West Central Landfill.

Primary Treatment. Screened influent flows from the grit chamber to one of two 95-foot diameter conventional primary clarifiers with a design capacity of 15 MGD each. Primary overflows to the Primary Effluent Distribution Structure, where it is routed to secondary treatment.

The Facility also has the option to utilize Chemically-Enhanced Primary Treatment (CEPT), as necessary, during wet weather events. The CEPT uses a coagulant (ferric chloride and an anionic emulsion polymer) to enhance flocculation and coagulation during primary clarification. The CEPT enhancement allow for the primary clarifiers to process a combined flow greater than 30 MGD. Ferric chloride can be added to the primary influent at the Parshall flume upstream of the grit chamber, and polymer can be added at the primary clarifier splitter inside the grit chamber.

Primary Solids. Settled primary solids are pumped from the bottom of the clarifiers to the primary anaerobic digesters or alternatively, to dissolved air floatation thickeners (DAFT) and then to the primary anaerobic digesters. The Facility has three primary anaerobic digesters. Primary scum is captured by scum skimmers and sent to the primary scum skimmings wet well. The contents of the wet well are periodically pumped to the digesters.

Secondary Treatment. The secondary treatment system consists of three aeration basins and four secondary clarifiers. The original mechanical surface aeration basins at the Facility were recently retrofitted, reconfiguring the original square, complete mix-activated sludge basins to a serpentine flow pattern that approximates a rectangular plug-flow basin. Each basin now utilizes a diffused air system and has been configured as the Modified Ludzack Ettinger (MLE) activated sludge process. The MLE process consists of an anoxic zone followed by an aerobic zone, with internal mixed liquor recycle to recycle aerobic effluent back to the anoxic zone for denitrification of ammonia oxidized to nitrate in the aerobic zone. As compared to the previous complete mixed basins, the new activated sludge process provides the benefits of removing nitrogen, recovering oxygen, conserving alkalinity, and conditioning the biomass for good sludge settleability.

The secondary clarifiers are of the center-feed, rim-collection type. Clarified effluent is collected in launders attached to the inside perimeter of the clarifier. Clarifiers 1, 2, and 3 are 80-foot diameter units, while Clarifier 4 is a 120-foot diameter unit. The secondary clarifiers have a total hydraulic capacity of 60 MGD. Activated sludge accumulates and thickens over the clarifier floor, where it is collected and pumped to the Return Activated Sludge/Mixed Liquor Return (RAS/MLR) distribution box for mixing and distribution to the aeration basins.

Secondary Solids. Scum and Waste Activated Sludge (WAS) are pumped to the DAFT mixing facility prior to conveyance to the primary anaerobic digesters.

Filtration. Secondary effluent flows from the secondary clarifiers to the secondary effluent diversion box where it is directed to either a cloth-media disk filter system or a conventional deep-bed, dual media filter system. Currently all flow is being filtered using the cloth media filtration system, with the conventional media filters held in standby for high flows or for backup of the cloth filters, as necessary. The cloth-media filtration system and the conventional media filters have an hydraulic capacity of 24 MGD and 16 MGD, respectively, with a combined filter capacity of approximately 40 MGD. Backwash from the filters is

discharged to backwash equalization basins that ultimately flow back to the influent pump station.

Disinfection: Chlorination and Dechlorination. Chlorine gas is stored in 1-ton containers and is used to make a concentrated chlorine/water solution to disinfect the filtered secondary effluent. Disinfection contact time is provided in the chlorine contact chamber and in two 3000-foot parallel pipelines that carry effluent south to the effluent outfall building. A sulfur dioxide/water solution is injected into the secondary effluent flow stream for dechlorination near the outfall building just after the two parallel pipelines join into a single pipeline.

Outfall. The outfall facilities include the outfall weir structure, dry and wet-weather diffuser pipes, emergency effluent diversion and flow measurement and sampling systems. The weir controls flow from the 66-inch filtered effluent pipeline, maintaining full pipe flow to provide additional chlorine contact time past the chlorine contact chamber.

Effluent flow past the weir splits between the dry-weather and wet-weather diffuser pipes. The dry-weather diffuser pipe is designed for flow up to 30 MGD. Flow above 30 MGD is diverted into the second outfall diffuser. The weir structure is equipped with two stop log weirs, one serving each outfall. The weir elevations can be split adjusted by installing or removing stop logs to achieve the desired flow split. The dry-weather diffuser is the primary diffuser and is used continuously throughout the year. The wet weather diffuser's hydraulic capacity is 30 MGD and accommodates Facility effluent flows above 30 MGD and up to 60 MGD.

The Facility operates an emergency bypass system that discharges effluent to Pond 6 in an event of excessive chlorine residual or low pH at the outfall building. The plant alarm is initiated during such an event signaling immediate operator attention.

Anaerobic Digestion. The Facility has three primary digesters and one secondary digester, each with a 65-foot diameter and a working volume of 662,000 gallons. The primary digesters can process solids directly from the primary and secondary clarifiers. Biodegradation of organic materials and production of methane gas and carbon dioxide take place in the primary digesters, which are continually mixed and heated within the mesophilic temperature range (approximately 95°F). Digested solids from the primary digesters overflows by gravity to the secondary digester or can be pumped. Fitted with a floating gasholder cover, the secondary digester stores primary digested sludge and biogas produced in the primary digesters. Biogas is used to fuel hot water boilers for digester heating with natural gas as a secondary fuel. Excess biogas is combusted at a single conventional flare located east of the CEPT facility. Digested sludge can be withdrawn from the bottom of the secondary digester and transferred to the facultative sludge ponds or to solids dewatering.

The Facility also has two DAFT units which may be utilized to thicken primary solids and WAS.

Sludge Dewatering and Disposal. After digestion sludge is dewatered by one of the Facility's two centrifuges. Centrate from the dewatering process is currently routed to Pond 5A and 5B for equalization and ultimately metered back to the Facility headworks for treatment. Currently centrate is discharged to Pond 5A and 5B approximately 4 days per week at a rate of 100 gallons per minute (6-7 hours/day).

Pond System. The Facility has 13 ponds used for influent flow equalization, emergency storage, and facultative treatment and/or centrifuge centrate management, and solids drying (if necessary). Ponds 1A and 1B are concrete-lined basins capable of receiving raw sewage, primary effluent and secondary effluent. A standpipe located in Pond 1A provides emergency secondary effluent overflow if head level in the secondary effluent distribution box exceeds total filtration capacity. Emergency bypass of primary effluent (from primary effluent

distribution box) and secondary effluent (from secondary effluent collection structure and secondary effluent distribution box) can discharge to Pond 1A. Additionally, raw sewage from the influent pump station can discharge to Ponds 1B, 2, 3A, 3B, 4, 5A, 5B, 6, 7, 8, 9, and 10 through a series of manually operated valves. Ponds 1A and 1B are concrete-lined. Ponds 3A and 3B have clay-lined bottoms with shotcrete lined banks. Ponds 5A and 5B are constructed with a hydraulic asphalt-lined bottom and high density polyethylene-lined banks and are being used for centrifuge centrate flow management. Flow from the ponds can return to the influent pump station and is measured at a meter vault located between Pond 1A and the filtration system. All ponds have electronic level indicators and transmit level to the Facility's SCADA system. Historically, Ponds 3A, 3B, 5A, and 5B were used as the Facility's facultative sludge lagoons (FSLs); however recent upgrades to the Facility's solids treatment and handling processes has negated the need of the FSLs for solids stabilization. Currently, the Discharger is utilizing Pond 5A and 5B as centrifuge centrate equalization and Pond 3A and 3B for emergency storage.

B. Discharge Points and Receiving Waters

1. The Facility (Assessor's Parcel No. 050-030-12) is located in Section 31, T31N, R4W, MDB&M, as shown in Attachment B, a part of this Order.
2. Treated municipal wastewater is discharged at Discharge Point No. 001 to the Sacramento River, a water of the United States at a point latitude 40° 29' 56.5" N and longitude 122° 21' 36.5" W.
3. Discharge Point No. 001 is located within the Enterprise Flat Hydrologic Area (508.10) of the Redding Hydrologic Unit as defined by the interagency hydrologic map for the Sacramento Hydrologic Basin prepared by the Department of Water Resources (1986).

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

Effluent limitations contained in Order R5-2010-0096 for discharges from Discharge Point D-001 (Monitoring Location EFF-001) and representative monitoring data from the term of Order R5-2010-0096 are as follows:

Table F-2. Historic Effluent Limitations and Monitoring Data

Parameter	Units	Effluent Limitation			Monitoring Data (5/1/2013 – 5/31/2016)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
Flow[1]	mgd	8.8	--	--	7.6[9]	20.8[10]	21.8
Biochemical Oxygen Demand [2]	mg/L	10	15	30	6.56	9.0	10
	lb/day[3]	734	1101	2202	--	--	--
	% Removal	85	--	--	--	--	--
Total Suspended Solids	mg/L	10	15	30	6.3	9.95	14.5
	lb/day[3]	734	1101	2202	--	--	--
	% Removal	85	--	--	--	--	--
pH	SU	--	--	6.0 – 8.5	min = 3.94, max = 7.39		
Copper, Total Recoverable	µg/L	17	--	26	17.2	--	29
Chlorodibromo-methane	µg/L	3.5	--	10.3	1.67	--	1.67

Parameter	Units	Effluent Limitation			Monitoring Data (5/1/2013 – 5/31/2016)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
Dichlorobromo-methane	µg/L	12.2	--	29.3	13.4	--	13.4
Zinc, Total Recoverable	µg/L	57	--	86	68.75	--	92.8
Ammonia, Total (as N)	mg/L	0.7	--	2.15	3.2	12.5	12.5
Total Coliform Organisms	MPN/100 mL	--	23[4]	240[5]	--	<2 (7-day median)	110
Total Residual Chlorine	mg/L	0.01 as 4-day average 0.02 as 1-hour average			<0.01	--	<0.01
Acute Toxicity	% Survival	--	--	70[6]/90[7]	95% (minimum survival rate reported)		
Chronic Toxicity	TU_C	No Chronic Toxicity[8]			>1TU_c (ceriodaphnia reproduction)		
Aluminum	µg/L	200 as calendar annual average			38.1 maximum annual average		

1 30-day average dry weather flow
2 5-Day biochemical oxygen demand @ 20°C
3 Based on average dry weather flow of 8.8 mgd
4 7-day median
5 Not to exceed more than once in 30-day period
6 Minimum for any one bioassay
7 Median for any three consecutive bioassays
8 Chronic toxicity trigger for accelerated monitoring was 1 TU_c with a twice per year monitoring frequency.
9 Long-term Average.
10 Maximum 4-day Average (2011)

D. Compliance Summary

Between 3 September 2007 and 31 May 2012 the Discharger reported into the California Integrated Water Quality System (CIWQS) database 78 alleged violations related to sanitary sewer overflows from the Clear Creek (and Stillwater) collection systems. On both 15 February 2011 and 13 April 2012, Notices of Violations for alleged violations related to various sanitary sewer overflows included in the CIWQS database were issued. Discharges of sewage from the collection system were prohibited under the 2010 Clear Creek NPDES Permit and the SSO General Order.

On 18 May 2011, a Notice of Violation was issued to the Discharger for multiple alleged effluent limit violations and for allegedly bypassing filtration treatment for a portion of inflow between 23 March 2011 and 3 April 2011 at the Clear Creek WWTP, the Notices of Violation alleged that the bypass events were in violation of Discharge Prohibitions and Standard Provision I.G.3. in the 2010 Clear Creek NPDES Permit.

On 19 July 2011, the Assistant Executive Officer issued Administrative Civil Liability Complaint No. R5-2011-0587 to the Discharger. The Complaint recommended imposing an administrative civil liability totaling $200,000 for alleged effluent limitation violations and mandatory minimum penalties for discharges from the Clear Creek WWTP during the period of 17 December 2009 to 2 April 2011.

To resolve the administrative civil liability complaints, outstanding Notices of Violation, and any other alleged violations, the City of Redding and Regional Board staff determined that it was in the interest of judicial efficiency, the citizens of Redding and the citizens of California to enter into a global settlement agreement that would address all outstanding penalties and alleged violations. The Settlement Agreement (Order No. R5-2012-0112) was adopted December 2012.

In June 2014 the Discharger exceeded the average monthly and maximum daily copper effluent limitations. The reported values were 17.2 µg/L and 29 µg/L, respectively.

On 8 April 2016, a Notice of Violation was issued to the Discharger for alleged effluent limit violations of effluent zinc and pH between 5 May 2015 and 22 October 2015 at the Clear Creek WWTP. The reported average monthly and maximum daily zinc effluent concentrations were reported as 68.75 µg/L and 92.8 µg/L, respectively. The pH (instantaneous minimum) was reported at 3.96 standard units.

E. Planned Changes

The Facility has undergone major upgrades during the past ten years, including improvements to the preliminary, primary, secondary, filtration, disinfection, and solids treatment processes. The multi-year rehabilitation and expansion project has increased treatment capacity (design dry weather flow from 8.8 MGD to 9.4 MGD) and overall reliability of the Facility. The Discharger has requested that permitted ADWF remain at 8.8 MGD until appropriate environmental review is conducted to justify a permitted increase in effluent discharge.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this Order are based on the requirements and authorities described in this section.

A. Legal Authorities

This Order serves as WDR's pursuant to article 4, chapter 4, division 7 of the California Water Code (commencing with section 13260). This Order is also issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. EPA and chapter 5.5, division 7 of the Water Code (commencing with section 13370). It shall serve as an NPDES permit for point source discharges from this Facility to surface waters.

B. California Environmental Quality Act (CEQA)

Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of Chapter 3 of CEQA, (commencing with section 21100) of Division 13 of the Public Resources Code.

C. State and Federal Laws, Regulations, Policies, and Plans

1. **Water Quality Control Plan.** Requirements of this Order specifically implement the applicable Water Quality Control Plans.

    a. **Basin Plan.** The Central Valley Water Board adopted a *Water Quality Control Plan, Fourth Edition (Revised July 2016), 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. Requirements in this Order implement the Basin Plan. In addition, the Basin Plan implements State Water Board Resolution 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 F-3. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	Sacramento River (from Shasta Dam to Colusa Basin Drain)	Existing: Municipal and domestic water supply (MUN), agricultural supply and stock watering (AGR), industrial service supply and power (IND and POW), contact (REC-1) and non-contact (REC-2) water recreation, warm freshwater habitat (WARM); cold freshwater habitat (COLD), warm and cold migration (MGR); warm and cold spawning (SPWN), wildlife habitat (WILD), and navigation (NAV).

2. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** U.S. EPA adopted the NTR on 22 December 1992, and later amended it on 4 May 1995 and 9 November 1999. About forty criteria in the NTR applied in California. On 18 May 2000, U.S. EPA 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 federal water quality criteria for priority pollutants.

3. **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 the U.S. EPA through the NTR and to the priority pollutant objectives established by the Central Valley Water Board in the Basin Plan. The SIP became effective on 18 May 2000, with respect to the priority pollutant criteria promulgated by the U.S. EPA 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.

4. **Antidegradation Policy.** Federal regulation 40 C.F.R. section 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 68-16, the Statement of Policy with Respect to Maintaining High Quality of Waters in California (State Anti-Degradation Policy). The State Anti-Degradation Policy is deemed to incorporate the federal antidegradation policy where the federal policy applies under federal law. The State Anti-Degradation Policy requires that existing water quality 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. The permitted discharge must be consistent with the antidegradation provision of 40 C.F.R. section 131.12 and the State Anti-Degradation Policy. The Board finds this order is consistent with the Federal and State Water Board antidegradation regulations and policy.

5. **Anti-Backsliding Requirements.** Sections 402(o) and 303(d)(4) of the CWA and federal regulations at 40 C.F.R. section 122.44(l) restrict backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be

as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed.

6. **Domestic Water Quality.** In compliance with Water Code 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.

7. **Endangered Species Act Requirements.** 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, §§ 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. §§ 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.

8. **Emergency Planning and Community Right to Know Act.** Section 13263.6(a) of the Water Code, 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 most recent toxic chemical data report does not indicate any reportable off-site releases or discharges to the collection system for this Facility. Therefore, a reasonable potential analysis based on information from EPCRA cannot be conducted. Based on information from EPCRA, there is no reasonable potential to cause or contribute to an excursion above any numeric water quality objectives included within the Basin Plan or in any State Water Board plan, so no effluent limitations are included in this permit pursuant to Water Code section 13263.6(a).

   However, as detailed elsewhere in this Order, available effluent data indicate that there are constituents present in the effluent that have a reasonable potential to cause or contribute to exceedances of water quality standards and require inclusion of effluent limitations based on federal and state laws and regulations.

9. **Storm Water Requirements.** USEPA promulgated federal regulations for storm water on 16 November 1990 in 40 C.F.R. 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. The Discharger has submitted a Notice of Intent (NOI) and been approved for coverage under the State Water Board's Industrial Storm water General Order. Therefore, this Order does not regulate storm water.

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

1. Under section 303(d) of the 1972 CWA, states, territories and authorized tribes are required to develop lists of water quality limited segments. The waters on these lists do not meet water quality standards, even after point sources of pollution have installed the

minimum required levels of pollution control technology. On 11 October 2011 USEPA gave final approval to California's 2008-2010 section 303(d) List of Water Quality Limited Segments. The Basin Plan references this list of Water Quality Limited Segments (WQLSs), which are defined as "…*those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources* (40 C.F.R. 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, from Keswick Dam to Cottonwood Creek, is listed as a WQLS for unknown toxicity in the 303(d) list of impaired waterbodies.

2. **Total Maximum Daily Loads (TMDL's).** USEPA requires the Central Valley Water Board to develop TMDL's for each 303(d) listed pollutant and water body combination. Table F-4, below, identifies the 303(d) listings and the status of each TMDL.

Table F-4. 303 (d) List for Sacramento River, Keswick Dam to Cottonwood Creek

Pollutant	Potential Sources	TMDL Completion[1]
Unknown Toxicity	Unknown	(2019)

[1] Dates in parenthesis are proposed TMDL completion dates.

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 TMDL's 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.

E. Other Plans, Polices and Regulations

Title 27. The wastewater treatment, storage, and disposal activities described in this Order, 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), pursuant to Title 27 CCR section 20090(a). This provision exempts from Title 27 requirements discharges of domestic sewage or treated effluent that are regulated by WDRs and that are consistent with applicable water quality objectives, and treatment or storage facilities associated with municipal wastewater treatment plants. (Cal. Code Regs., tit 27, § 20090(a).) The discharge authorized herein is waste that consists primarily of domestic sewage and treated effluent that is regulated by waste discharge requirements consistent with water quality objectives. Furthermore, 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 C.F.R. § 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 C.F.R. section 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 C.F.R. section 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 C.F.R. section 122.44(a) requires that permits include applicable technology-based limitations and standards; and 40 C.F.R. section 122.44(d) requires that permits include WQBEL's to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established. The Basin Plan at page IV-17.00, contains an implementation policy, "Policy for Application of Water Quality Objectives", that specifies that the Central Valley 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 C.F.R. section 122.44(d)(1). With respect to narrative objectives, the Central Valley Water Board must establish effluent limitations using one or more of three specified sources, including: (1) USEPA's published water quality criteria, (2) a proposed state criterion (i.e., water quality objective) or an explicit state policy interpreting its narrative water quality criteria (i.e., the Central Valley Water Board's "Policy for Application of Water Quality Objectives")(40 C.F.R. § 122.44(d)(1)(vi)(A), (B) or (C)), or (3) an indicator parameter.

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

municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses."

A. Discharge Prohibitions

1. **Prohibition III.A (No discharge 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 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 section 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 C.F.R. section 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 C.F.R. section 122.41(m)(4), prohibits bypass unless it is unavoidable to prevent loss of life, personal injury, or severe property damage. In considering the Regional 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 C.F.R. section 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 C.F.R. section 122.41 et seq. that requires the proper design and operation of treatment facilities

5. **Prohibition III.E (No discharge of hazardous waste).** This prohibition concerns a category of waste that is subject to full containment as prescribed by Title 23 and Title 27 of the CCR and, if discharged, has a high potential for creating a condition that would violate Prohibition III.C. as well.

B. Technology-Based Effluent Limitations

1. Scope and Authority

Section 301(b) of the CWA and implementing U.S. EPA permit regulations at 40 C.F.R. section 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 C.F.R. part 133.

Regulations promulgated in 40 C.F.R. section 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 POTW's [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 U.S. EPA Administrator.

Based on this statutory requirement, U.S. EPA developed secondary treatment regulations, which are specified in 40 C.F.R. 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 biochemical oxygen demand (BOD_5), total suspended solids (TSS), and pH.

2. Applicable Technology-Based Effluent Limitations

a. **BOD_5 and TSS.** Federal regulations at 40 C.F.R. part 133, establish the minimum weekly and monthly average level of effluent quality attainable by secondary treatment for BOD_5 and TSS. A daily maximum effluent limitation for BOD_5 and TSS is also included in the Order to ensure that the treatment works are not organically overloaded and operate in accordance with design capabilities. In addition, 40 C.F.R. section 133.102, in describing the minimum level of effluent quality attainable by secondary treatment, states that the 30-day average percent removal shall not be less than 85 percent. This Order contains a limitation requiring an average of 85 percent removal of BOD_5 and TSS over each calendar month. This Order requires Water Quality Based Effluent Limitations (WQBEL's) that are equal to or more stringent than the secondary technology-based treatment described in 40 CFR Part 133 (See section IV.C.3.c of the Fact Sheet for a discussion on Pathogens which includes WQBEL's for BOD_5 and TSS.)

b. **Flow.** The Facility was designed to provide an advanced-secondary treatment level of treatment for up to an average dry weather design flow of 9.4 mgd, however, the Discharger has requested that this Order maintain the previous Order's average dry weather flow limitation of 8.8 mgd. Therefore, this Order contains an average dry weather discharge flow effluent limit of 8.8 mgd.

c. **pH.** The secondary treatment regulations at 40 C.F.R. part 133 also require that pH be maintained between 6.0 and 9.0 standard units. This Order, however, requires more stringent WQBEL's for pH to comply with the Basin Plan's water quality objectives for pH.

Summary of Technology-based Effluent Limitations
Discharge Point 001

Table F-5. Summary of Technology-based Effluent Limitations[1]

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Biochemical Oxygen Demand (BOD) 5-day@20°C	mg/L	30	45	--	--	--
	lbs/day[2]	2208	3303	--	--	--
	Percent Removal	85	--	--	--	--
Total Suspended Solids (TSS)	mg/L	30	45	--	--	--
	lbs/day[2]	2208	3303	--	--	--
	Percent Removal	85	--	--	--	--
pH	Standard Units	--	--	--	6.0	9.0
Flow	MGD	8.8	--	--	--	--

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

[1] Note that more stringent WQBEL's for BOD_5, pH, and TSS are applicable and are established as final effluent limitations in this Order (see section IV.C.3.c of this Fact Sheet).

[2] Based on an average dry weather flow of 8.8 MGD.

C. Water Quality-Based Effluent Limitations (WQBEL's)

1. Scope and Authority

CWA Section 301(b) and 40 C.F.R. section 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.c of the Fact Sheet.

Section 122.44(d)(1)(i) of 40 C.F.R. requires 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, WQBEL's must be established using: (1) U.S. EPA 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 section 122.44(d)(1)(vi).

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

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

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

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

The federal CWA section 101(a)(2), states: "*it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water be*

achieved by July 1, 1983." Federal Regulations, developed to implement the requirements of the CWA, create a rebuttable presumption that all waters be designated as fishable and swimmable. Federal Regulations, 40 CFR sections 131.2 and 131.10, require that all waters of the State regulated to protect the beneficial uses of public water supply, protection and propagation of fish, shell fish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation. 40 C.F.R. section 131.3(e) 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 C.F.R. 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.** Refer to III.C.1. above for a complete description of the receiving water and beneficial uses.

b. **Effluent and Ambient Background Data.** The reasonable potential analysis (RPA), as described in section IV.C.3 of this Fact Sheet, was based on data from May 2013 through May 2016, which includes effluent and ambient background data submitted in SMRs and the Report of Waste Discharge (ROWD).

c. **Assimilative Capacity/Mixing Zone.** In the ROWD, the Discharger requested dilution credits for aquatic life and human health constituents based on the Sacramento River's critical flows and the projected[1] effluent discharge rate for the associated criterion:

Criteria	Critical Receiving Water Flow[1]	Effluent Flow
Aquatic life - acute	3,057 cfs (1Q10)	26 mgd (max day)
Aquatic life - chronic	3,240 cfs (7Q10)	24 mgd (4-day avg. max)
Human Health	8,314 cfs (Harmonic Mean)	9.0 mgd (long-term avg.)

[1] Calculated with DFLOW program and based on California Data Exchange Center (CDEC) reservoir and dam discharge records for Keswick Reservoir and Whiskeytown Dam over an 18-year record period (January 1995 to December 2012).

The constituents with effluent limitations derived using dilution credits in this Order that are based on aquatic-life and human health criteria include total recoverable copper, total recoverable zinc, chlorodibromomethane, dichlorobromomethane, and nitrate plus nitrite (as N). The maximum observed background receiving water concentration for each of these parameters and the most stringent applicable criteria are listed below to demonstrate the receiving water's assimilative capacity for each parameter.

Parameter	Units	Lowest Criteria/ Water Quality Objective	Max Observed RW Backgrd. Conc.	Assimilative Capacity
		C	B	C-B
Copper, Dissolved	µg/L	5.0	3.6	1.4

[1] The Discharger requested that dilution credits for this Order be determined using the projected effluent flows for the next 5 years (through 2020) and not the observed flows for the past 5 years. The effluent flows for the past 5-years, 21.8 mgd (max), 20.8 mgd (4-day max), and 7.6 mgd (long-term avg.), are lower than the 5-year projection due to anticipated growth and wet weather capacity improvements at the facility.

Copper, Total Recoverable	µg/L	5.2	6.9	-1.7
Chlorodibromomethane	µg/L	0.41	<0.06	0.35
Dichlorobromomethane	µg/L	0.56	<0.06	0.50
Zinc, Total Recoverable	µg/L	19.7	10	9.7
Nitrate plus Nitrite (as N)	mg/L	10	1.4	8.6

The CWA directs the 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 § 122.44 and 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).

For non-Priority Pollutant constituents 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 TMDL's, 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*." [emphasis added]

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.****"* [emphasis added]

Background. Order R5-2010-0096 granted dilution credits for total recoverable copper, total recoverable zinc, chlorodibromomethane, and dichlorobromomethane. The dilution credits were supported by the Discharger's May 2005 dilution/mixing zone dye study that was conducted utilizing the Facility's original outfall diffuser, which was later decommissioned in 2009. A new outfall was installed in 2009 approximately 70 feet downstream from the original outfall and the Discharger performed a qualitative dye release study on the new diffuser to support the applicability of the 2005 dilution/mixing zone study to the Facility's newly-installed diffuser. Order R5-2010-096 found the results of the 2005 study applicable to the Facility's newly-installed diffuser, however, only up to effluent flows of 16 mgd. In 2013, during the term of Order R5-2010-096, the Discharger performed a dilution/mixing zone dye study (2013 Study) on the new outfall for the purpose of validating the dilution credits and mixing zone sizes granted by Order R5-2010-0096 and to potentially obtain dilution/mixing zones for higher flow conditions. The

dilution credits and mixing zones granted in Order R5-2010-0096 are provided below:

Table F-6. Historic Dilution Credits and Mixing Zones

Parameter	Units	Dilution Credit	Mixing Zone Size
Copper, Total Recoverable	µg/L	2:1	10 feet (acute and chronic)
Zinc, Total Recoverable	µg/L	2:1	10 feet (acute and chronic)
Chlorodibromomethane	µg/L	12:1	14.3 feet (human health)
Dichlorobromomethane	µg/L	30:1	36 feet (human health)

The mixing zone validation efforts of the 2013 Study found, in general, that the dilution credits granted in Order R5-2010-0096 were supported by mixing conditions downstream of the new outfall. At minimum, effluent flows up to 30 MGD discharged under aquatic life critical conditions receive a 2:1 dilution 10 feet downstream of the dry weather diffuser. However, the 2013 Study results suggest that larger human health mixing zones are required in order to achieve dilution credits of 12:1 and 30:1 which were established in Order R5-2010-0096. At minimum for existing effluent flows, a human health dilution of 19:1 is achieved 50 feet downstream and a dilution of 31:1 is achieved 100 feet downstream of the dry weather diffuser.

Diffuser Configuration. The Discharger's effluent outfall consists of a single flow control (weir) structure onshore that discharges to two effluent diffusers near River Mile 288.5 (right bank) in the Sacramento River. Effluent flows are split between two outfall diffusers: a "dry-weather" diffuser and a "wet weather" diffuser. The dry-weather diffuser is designed for flows up to 30 mgd. Effluent flows above 30 mgd are diverted into the wet weather diffuser, which also has a design capacity of 30 mgd. Therefore, combined total outfall design capacity is 60 mgd. The outfall weir structure is equipped with two stop log weirs, one serving each outfall diffuser, which enable split flows if necessary.

The dry weather diffuser pipe is 190 feet in length and is located immediately upstream of the wet weather diffuser. The dry weather diffuser pipeline consists of a buried 42" steel pipe with 20, 10" Tideflex check valve ports on 10-foot centers. The wet weather diffuser pipe is 20 feet in length and consists of a buried 42" steel pipe with 3, 24" Tideflex check valve ports on 10-foot centers.

Sacramento River. Upstream of the discharge, flows in the Sacramento River are largely dependent on releases from upstream reservoirs. The reservoirs are operated such that minimum receiving water flows may occur during peak wet weather effluent flows at the Facility. Critical flow-based dilution ratios (once the receiving water and effluent become fully mixed downstream) at the Facility are presented below. The discharge is <u>not</u> a completely mixed discharge, as defined by the SIP.

Criteria	Critical Receiving Water Flow	Effluent Flow	Ultimate Dilution Ratio (if "Completely-Mixed")
Aquatic life - acute	3,057 cfs (1Q10)	26 mgd (max day)	76:1
Aquatic life - chronic	3,240 cfs (7Q10)	24 mgd (4-day avg. max)	87:1
Human Health	8,314 cfs (Harmonic	9.0 mgd (long-term avg.)	597:1

	Mean)		

The river gradient in the outfall area is primarily large runs and areas of shallow riffles. A gravel bar located approximately 300 feet offshore of the outfall splits the river into two channels for a short length. Downstream of the gravel bar (and the outfall) the bank to bank river width is not less than 500 feet. The river bed consists primarily of cobble and large gravel and depths at the outfall diffuser location range from 4 to 6 feet at low flows and up to 25 feet at peak river flows.

Four seasonal Sacramento River Chinook salmon runs and steelhead are known to spawn and rear in the river reach and in Clear Creek (a tributary located upstream of the outfall) and all freshwater life stages of salmonids may occur year-round in the vicinity of the outfall. The 2013 Study identified Chinook habitat for juvenile rearing and adult holding immediately downstream of the outfall along the right bank of the river. The spring-run Chinook salmon and steelhead are listed as threatened and winter-run Chinook salmon is listed as endangered under the Endangered Species Act (ESA). Fall-run Chinook salmon in the Sacramento River is listed as a species of concern under the ESA. The river reach at RM 288.5 is also designated critical habitat (migration, spawning, and juvenile rearing) for Chinook and Steelhead.

Dilution Study Results. The 2013 Study provided downstream dilution delineations at 50 ft., 100 ft., 500 ft., and 1000 ft. for a variety of effluent and receiving water flow combinations. The 2013 Study also analyzed the individual and combined mixing dynamics of the Facility's two diffusers (e.g., the dry weather and wet weather diffusers). In addition, the Discharger provided a Biological Implication Assessment (BIA) of potential impacts to biological resources as a result of a mixing zone. The California Department of Fish and Wildlife (CDFW) reviewed the BIA and concurred with the findings of the BIA. Specifically, CDFW concluded that the Discharger's effluent met water quality temperature and whole effluent toxicity standards at the edge of the mixing zone, that there was suitable fish passage around and through the mixing zone for rearing and in-and-out migrating salmonids and other species.

A subset of the results presented in the 2013 Study, and referenced in this Order, are summarized in the table below. Since projected flows during the permit term are not anticipated to exceed the 30 MGD design capacity of the dry weather diffuser, modeling results of the dry weather diffuser were only considered during this permit renewal.

Table F-7. 2013 Mixing Zone Study Results – Dry Weather Diffuser Only

Criteria	Projected Effluent Flows through YR. 2020	Critical River Flows	Downstream Distance from Diffuser (ft.)	Dilution Factor
Acute Aquatic Life	26 MGD (Max Day)	3057 cfs (1Q10)	50 100	25 42
Chronic Aquatic Life	24 MGD (4-day Avg. Max.)	3240 cfs (7Q10)	50 100	25 42
Human Health	9.0 MGD (Long Term Avg.)	8314 cfs (Harmonic	50 100	20 31

		Mean)	150	122

Dilution credits allowed for in this Order are in accordance with Section 1.4.2.2 of the SIP. The allowance of a mixing zone and dilution credits are a discretionary act by the Central Valley Water Board. The Central Valley Water Board has determined that the maximum dilution credit on a constituent-by-constituent basis needed for this discharge are shown in the following table (also discussed further in section IV.C.3.c).

Table F-8. Dilution Credits Associated with Performance-based Effluent Limitations

Pollutant	Units	ECA[1]	Criterion	Background	Dilution Credit[2]
Copper, Total Recoverable	µg/L	34.7 (acute) 22.7 (chronic)	5.0 (dissolved)	3.6 (dissolved)	8 (acute) 12 (chronic)
Chlorodibromomethane	µg/L	3.56	0.41	<0.06	9 (HH)
Dichlorobromomethane	µg/L	15.56	0.56	<0.06	30 (HH)
Nitrate + Nitrite, Total (as N)	mg/L	19.94	10	1.4	1 (HH)
Zinc, Total Recoverable	µg/L	116.7 (acute) 123.8 (chronic)	19.7	10	10 (acute) 1 (chronic)

[1] Equivalent to the performance-based AMEL or annual average effluent limitation.

[2] The dilution credit is calculated using the steady-state mass balance equation rearranged to solve for the dilution credit, as follows:

$$D = (ECA – C) / (C – B)$$

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-8 based on the following:

i. 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.

ii. 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.

iii. 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 zone is small (less than 50 feet downstream of the discharge for all the parameters and at 100 feet for dichlorobromomethane) relative to the large size of the receiving water, is not at or near a drinking water intake, and does not overlap a mixing zone from a different outfall.

iv. The Central Valley Water Board is allowing a mixing zone for both aquatic life and human health constituents and has determined allowing such mixing zone will not cause acutely toxic conditions to aquatic life passing through the mixing zone.

v. The Central Valley Water Board has determined the discharge will not adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under the federal or State endangered

species laws. The discharge will not produce undesirable or nuisance aquatic life, result in floating debris, oil, or scum, produce objectionable odor, taste, or turbidity, cause objectionable bottom deposits, or cause nuisance, because the proposed Order establishes end-of-pipe effluent limitations (e.g., for BOD_5 and TSS) and discharge prohibitions to prevent these conditions from occurring.

vi. 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.

vii. The Central Valley Water Board has determined mixing zone complies with the SIP for priority pollutants.

viii. The mixing zone study indicates the maximum allowed dilution factor to be 122 (at 500ft.) for human health constituents, 25 (at 50 ft.) for acute aquatic life, and 86 (at 500 ft.) for chronic aquatic life. Section 1.4.2.2B of the SIP, in part states, *"The RWQCB shall deny or significantly limit a mixing zone and dilution credits as necessary to protect beneficial uses, meet the conditions of this Policy, or comply with other regulatory requirements."* The Central Valley Water Board has determined that the maximum a dilution factors are not needed or necessary for the Discharger to achieve compliance with this Order.

ix. 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.

x. 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, chlorodibromomethane, dichlorobromomethane, zinc, and nitrate plus nitrite. 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."*

The effluent limitations established in the Order for copper, chlorodibromomethane, dichlorobromomethane, zinc, and nitrate plus nitrite

that have been adjusted for dilution credits provided in Table F-8 were developed based on performance of the Discharger's current wastewater treatment capabilities. 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, chlorodibromomethane, dichlorobromomethane, zinc, and nitrate plus nitrite that have been adjusted for dilution credits provided in Table F-8 is consistent with Section 1.4.2.2B of the SIP that requires the Central Valley Water Board to shall deny or significantly limit a mixing zone and dilution credits as necessary to comply with other regulatory requirements.

xi. Therefore, the Central Valley Water Board has determined the effluent limitations established in the Order for copper, chlorodibromomethane, dichlorobromomethane, zinc, and nitrate plus nitrite that have been adjusted for dilution credits provided in Table F-8 are appropriate and necessary to comply with the Basin Plan, SIP, Federal anti-degradation regulations and Resolution 68-16.

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 conversion factors contained in Appendix 3 of the SIP were used to convert the applicable dissolved criteria to total recoverable criteria. The USEPA conversion factors were also used to convert copper's effluent concentration allowance from the dissolved form to total recoverable for the purpose of establishing water-quality based copper effluent limits as a total recoverable concentration.

e. **Hardness-Dependent CTR Metals Criteria.** The CTR and the NTR 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 hardness of the receiving water (actual ambient hardness) as required by the SIP[1] and the CTR[2]. The SIP and the CTR require the use of "receiving water" or "actual ambient" hardness, respectively, to determine effluent limitations for these metals. The CTR requires that the hardness values used shall be consistent with the design discharge conditions for design flows and mixing zones[3]. Where design flows for aquatic life criteria include the lowest one-day flow with an average reoccurrence frequency of once in ten years (1Q10) and the lowest average seven consecutive

[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 $CaCO_3$), or less, the actual ambient hardness of the surface water must be used (40 C.F.R. § 131.38(c)(4)).

[3] 40 C.F.R. §131.3(c)(4)(ii)

day flow with an average reoccurrence frequency of once in ten years (7Q10).[1] This section of the CTR also indicates that the design conditions should be established such that the appropriate criteria are not exceeded more than once in a three year period on average.[2] The CTR requires that when mixing zones are allowed the CTR criteria apply at the edge of the mixing zone, otherwise the criteria apply throughout the water body including at the point of discharge.[3] The CTR does not define the term "ambient," as applied in the regulations. Therefore, the Central Valley Water Board has considerable discretion to consider upstream and downstream ambient conditions when establishing the appropriate water quality criteria that fully complies with the CTR and SIP.

Summary findings

The ambient hardness for the Sacramento River is represented by the data in Figure F-1, below, which shows ambient hardness ranging from 35.4 mg/L to 53.5 mg/L based on collected ambient data from May 2013 through May 2016. Given the high variability in ambient hardness values, there is no single hardness value that describes the ambient receiving water for all possible scenarios (e.g., minimum, maximum). Because of this variability, staff has determined that based on the ambient hardness concentrations measured in the receiving water, the Central Valley Water Board has discretion to select ambient hardness values within the range of 35.4 mg/L (minimum) up to 53.5 mg/L (maximum). Staff recommends that the Board use the ambient hardness values shown in Table F-9 for the following reasons.

i. Using the ambient receiving water hardness values shown in Table F-9 will result in criteria and effluent limitations that ensure protection of beneficial uses under all ambient receiving water conditions.

ii. The Water Code mandates that the Central Valley Water Board establish permit terms that will ensure the reasonable protection of beneficial uses. In this case, using the lowest measured ambient hardness to calculate effluent limitations is not required to protect beneficial uses. Calculating effluent limitations based on the lowest measured ambient hardness is not required by the CTR or SIP, and is not reasonable as it would result in overly conservative limits that will impart substantial costs to the Discharger and ratepayers without providing any additional protection of beneficial uses. In compliance with applicable state and federal regulatory requirements, after considering the entire range of ambient hardness values, Board staff has used the ambient hardness values shown in Table F-9 to calculate the proposed effluent limitations for hardness-dependent metals. The proposed effluent limitations are protective of beneficial uses under all flow conditions.

iii. Using an ambient hardness that is higher than the minimum of 35.4 mg/L will result in limits that may allow increased metals to be discharged to the river, but such discharge is allowed under the antidegradation policy (State Water Board Resolution 68-16). The Central Valley Water Board finds that this degradation is consistent with the antidegradation policy (see antidegradation findings in Section IV.D.4 of the Fact Sheet). The Antidegradation policy

[1] 40 C.F.R. §131.38(c)(2)(iii) Table 4
[2] 40 C.F.R. §131.38(c)(2)(iii) Table 4, notes 1 and 2
[3] 40 C.F.R. §131.38(c)(2)(i)

requires the Discharger 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.

iv. Using the ambient hardness values shown in Table F-9 is consistent with the CTR and SIP's requirements for developing metals criteria.

Table F-9. Summary of CTR Criteria and Site-Specific Basin Plan Objectives for Hardness-dependent Metals

CTR Metals	Ambient Hardness (mg/L)[2,3]	CTR Criteria (µg/L, total recoverable)[1]		Basin Plan Site –Specific Objective (µg/L, total recoverable)[1]
		acute	chronic	Maximum Concentration
Copper	50	7.3	5.2	7.2
Chromium III	50	980	120	--
Cadmium	50 (acute) 50 (chronic)	2.1	1.4	0.30
Lead	50	34	1.3	--
Nickel	50	260	29	--
Silver	49	1.2	--	10
Zinc	50	67	67	19.7

[1] Metal criteria rounded to two significant figures in accordance with the CTR (40 C.F.R. §131.38(b)(2)).

[2] The ambient hardness values in this table represent actual observed receiving water hardness measurements from the dataset shown in Figure F-1.

[3] The Basin Plan and CTR's hardness dependent metals criteria equations vary differently depending on the metal, which results in differences in the range of ambient hardness values that may be used to develop effluent limitations that are protective of beneficial uses and comply with the Basin Plan Objective and CTR criteria for all ambient flow conditions.

Background

The State Water Board provided direction regarding the selection of hardness in two precedential water quality orders; WQO 2008-0008 for the City of Davis Wastewater Treatment Plant (Davis Order) and WQO 2004-0013 for the Yuba City Wastewater Treatment Plant (Yuba City Order). The State Water Board recognized that the SIP and the CTR do not discuss the manner in which hardness is to be ascertained, thus regional water boards have considerable discretion in determining ambient hardness so long as the selected value is protective of water quality criteria under the given flow conditions. (Davis Order, p.10). The State Water Board explained that it is necessary that, "The [hardness] value selected should provide protection for all times of discharge under varying hardness conditions." (Yuba City Order, p. 8). The Davis Order also provides that, "Regardless of the hardness used, the resulting limits must always be protective of water quality criteria under all flow conditions." (Davis Order, p. 11)

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

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

Where:

H = ambient hardness (as $CaCO_3$) [1]

WER = water-effect ratio

m, b = metal- and criterion-specific constants

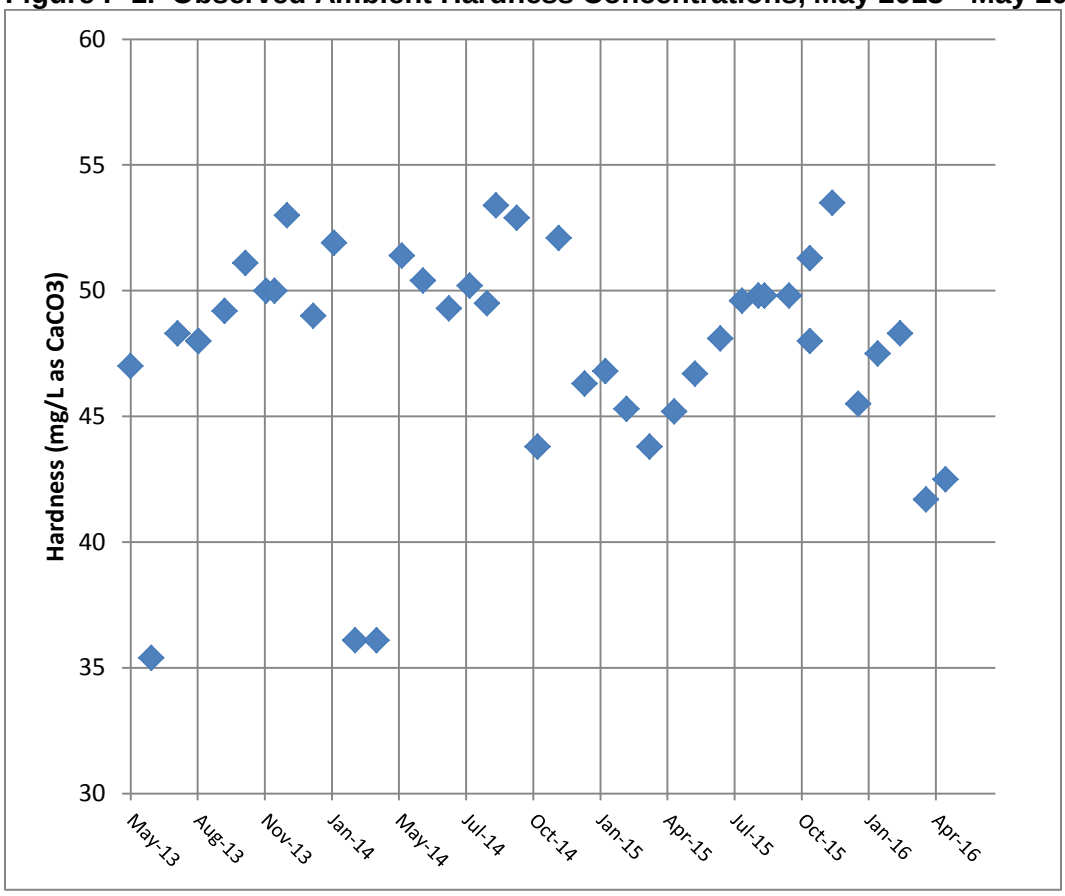
The direction in the CTR regarding hardness selection is that it must be based on ambient hardness and consistent with design discharge conditions for design flows and mixing zones. Consistent with design discharge conditions and design flows means that the selected "design" hardness must result in effluent limitations under design discharge conditions that do not result in more than one exceedance of the applicable criteria in a three year period.[2] Where design flows for aquatic life criteria include the lowest one-day flow with an average reoccurrence frequency of once in ten years (1Q10) and the lowest average seven consecutive day flow with an average reoccurrence frequency of once in ten years (7Q10). The 1Q10 and 7Q10 Sacramento River flows are 3,057 cfs and 3,240 cfs, respectively.

Ambient conditions

The ambient receiving water hardness varied from 35.4 mg/L to 53.5 mg/L, based on 42 samples from May 2013 through May 2016 (see Figure F-1).

[1] For this discussion, all hardness values are expressed in mg/L as $CaCO_3$.
[2] 40 C.F.R. §131.38(c)(2)(iii) Table 4, notes 1 and 2

Figure F-1. Observed Ambient Hardness Concentrations, May 2013 - May 2016



In this analysis, the entire range of ambient hardness concentrations shown in Figure F-1 were considered to determine the appropriate ambient hardness to calculate the CTR criteria and effluent limitations that are protective under all discharge conditions.

Approach to derivation of criteria

As shown above, ambient hardness varies substantially. Because of the variation, there is no single hardness value that describes the ambient receiving water for all possible scenarios (e.g., minimum, maximum, mid-point). While the hardness selected must be hardness of the ambient receiving water, selection of an ambient receiving water hardness that is too high would result in effluent limitations that do not protect beneficial uses. Also, the use of minimum ambient hardness would result in criteria that are protective of beneficial uses, but such criteria may not be representative considering the wide range of ambient conditions.

Reasonable worst-case ambient conditions. To determine whether a selected ambient hardness value results in effluent limitations that are fully protective while complying with federal regulations and state policy, staff have conducted an analysis considering varying ambient hardness and flow conditions. To do this, the Central Valley Water Board has ensured that the receiving water hardness and criteria selected for effluent limitations are protective under "reasonable-worst case ambient conditions." These conditions represent the receiving water conditions

under which derived effluent limitations would ensure protection of beneficial uses under all ambient flow and hardness conditions.

Reasonable worst-case ambient conditions:

- "Low receiving water flow." CTR design discharge conditions (1Q10 and 7Q10) have been selected to represent reasonable worst case receiving water flow conditions.

- "High receiving water flow (maximum receiving water flow)." This additional flow condition has been selected consistent with the Davis Order, which required that the hardness selected be protective of water quality criteria under all flow conditions.

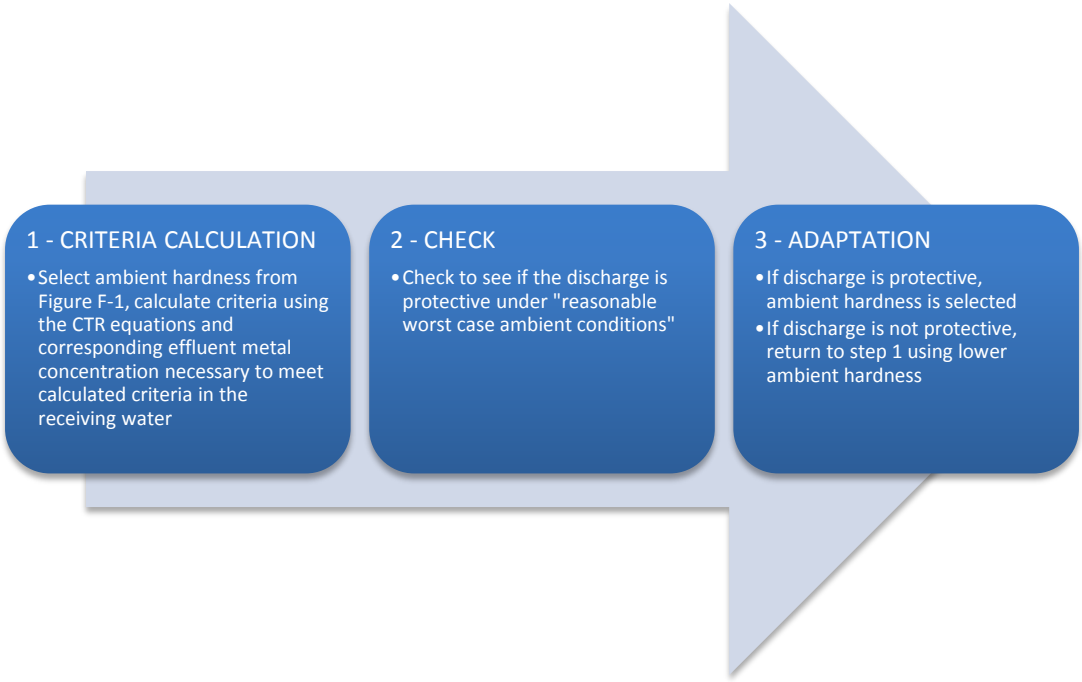
- "Low receiving water hardness." The minimum receiving water hardness condition of 35.4 mg/L was selected to represent the reasonable worst case receiving water hardness.

- "Background ambient metal concentration at criteria." This condition assumes that the metal concentration in the background receiving water is equal to CTR criteria or Basin Plan site specific objective (upstream of the facility's discharge). Based on data in the record, this is a design condition that has not occurred[1] in the receiving water and is used in this analysis to ensure that limits are protective of beneficial uses even in the situation where there is no assimilative capacity.

Iterative approach. An iterative analysis has been used to select the ambient hardness to calculate the criteria that will result in effluent limitations that protect beneficial uses under all flow conditions.

The iterative approach is summarized in the following algorithm and described below in more detail.

[1] Upstream total recoverable copper concentrations have exceeded total recoverable criteria twice in the last 3 years, however, upstream receiving water copper dissolved concentrations have not exceeded copper dissolved criteria.



1. CRITERIA CALCULATION. CTR criteria are calculated using the CTR equations based on actual measured ambient hardness sample results, starting with the maximum observed ambient hardness of 53.5 mg/L. Effluent metal concentrations necessary to meet the above calculated CTR criteria in the receiving water are calculated in accordance with the SIP.[1] This should not be confused with an effluent limit. Rather, it is the Effluent Concentration Allowance (ECA), which is synonymous with the wasteload allocation defined by USEPA as "a definition of effluent water quality that is necessary to meet the water quality standards in the receiving water."[2] If effluent limits are found to be needed, the limits are calculated to enforce the ECA considering effluent variability and the probability basis of the limit.

2. CHECK. USEPA's simple mass balance equation[3] is used to evaluate if discharge at the computed ECA is protective. Resultant downstream metal concentrations are compared with downstream calculated CTR criteria under reasonable worst-case ambient conditions.

3. ADAPT. If step 2 results in:

   (A) receiving water metal concentration that complies with CTR criteria under reasonable worst-case ambient conditions, then the hardness value is selected.

   (B) receiving water metal concentration greater than CTR criteria, then return to bullet 1, selecting a lower ambient hardness value.

[1] SIP Section 1.4.B, Step 2, provides direction for calculating the Effluent Concentration Allowance.
[2] U.S. EPA Technical Support Document for Water Quality-based Toxics Control (TSD), pg. 96.
[3] U.S. EPA NPDES Permit Writers' Handbook (EPA 833-K-10-001 September 2010, pg. 6-24)

The CTR's hardness dependent metals criteria equations contain metal-specific constants, so the criteria vary depending on the metal. Therefore, steps 1 through 3 must be repeated separately for each metal until ambient hardness values are determined that will result in criteria and effluent limitations that comply with the CTR and protect beneficial uses for all metals.

Results of iterative analysis

The above iterative analysis for each CTR hardness-dependent metal results in the selected ambient hardness values shown in Table F-9, above. Using these hardness values to calculate criteria, which are actual sample results collected in the receiving water, will result in effluent limitations that are protective under all ambient flow conditions. Copper and silver are used as examples below to illustrate the results of the analysis. Tables F-10 and F-11 below summarize the numeric results of the three step iterative approach for copper and silver. As shown in the example tables, ambient hardness values of 50 mg/L (copper) and 49 mg/L (silver) are used in the CTR equations to derive criteria and effluent limitations. Then under the "check" step, worst-case ambient receiving water conditions are used to test whether discharge results in compliance with CTR criteria and protection of beneficial uses.

The results of the above analysis, summarized in the tables below, show that the ambient hardness values selected using the three-step iterative process results in protective effluent limitations that achieve CTR criteria and Basin Plan objectives under all flow conditions. Tables F-10 and F-11 below, summarize the critical flow conditions. However, the analysis evaluated all flow conditions to ensure compliance with the CTR criteria at all times.

Table F-10. Verification of CTR Compliance for Copper

Receiving water hardness used to compute effluent limitations				**50 mg/L**
Effluent Concentration Allowance (ECA) for Copper[2]				**5.2 µg/L**
	Downstream Ambient Concentrations Under Worst-Case Ambient Receiving Water Conditions			**Complies with CTR Criteria?**
	Hardness	**CTR Criteria (µg/L)**	**Ambient Copper Concentration[1] (µg/L)**	
1Q10	35.5	3.8	3.8	**Yes**
7Q10	35.5	3.8	3.8	**Yes**
Max receiving water flow	35.4	3.8	3.8	**Yes**

[1] This concentration is derived using worst-case ambient conditions. These conservative assumptions will ensure that the receiving water always complies with CTR criteria.

[2] The ECA defines effluent quality necessary to meet the CTR criteria in the receiving water. This Order includes average monthly and maximum daily effluent limits for copper of 20.2 µg/L and 32.0 µg/L, respectively, as a result of the application of dilution credits for copper. The effluent limits were calculated per section 1.4 of the SIP, which ensures compliance with the ECA considering effluent variability and the probability basis of each effluent limit.

Table F-11. Verification of CTR Compliance for Silver

Receiving water hardness used to compute effluent limitations				**49 mg/L**
Effluent Concentration Allowance (ECA) for Silver[2]				**1.2 µg/L**
	Downstream Ambient Concentrations Under Worst-Case Ambient Receiving Water Conditions			**Complies with CTR Criteria?**
	Hardness	**CTR Criteria (µg/L)**	**Ambient Silver Concentration[1] (µg/L)**	
1Q10	35.5	0.7	0.7	**Yes**
7Q10	35.5	0.7	0.7	**Yes**
Max receiving water flow	35.4	0.7	0.7	**Yes**

[1] This concentration is derived using worst-case ambient conditions. These conservative assumptions will ensure that the receiving water always complies with CTR criteria.

[2] The ECA defines effluent quality necessary to meet the CTR criteria in the receiving water. There is no effluent limitation for silver as it demonstrates no reasonable potential.

3. Determining the Need for WQBELs

a. **Constituents with Total Maximum Daily Limitation (TMDL).** The Central Valley Water Board developed WQBELs for diazinon and chlorpyrifos. See Fact Sheet section IV.C.3.d for discussion on the development of WQBELs for diazinon and chlorpyrifos.

b. **Constituents with No Reasonable Potential.** WQBEL's are not included in this Order for constituents that do not demonstrate reasonable potential (i.e. constituents were not detected in the effluent or receiving water); 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. **Aluminum, Total Recoverable**

Aluminum is the third most abundant element in the earth's crust and is ubiquitous in both soils and aquatic sediments. When mobilized in surface waters, aluminum has been shown to be toxic to various fish species. However, the potential for aluminum toxicity in surface waters is directly related to the chemical form of aluminum present, and the chemical form is highly dependent on water quality characteristics that ultimately determine the mechanism of aluminum toxicity. Surface water characteristics, including pH, temperature, colloidal material, fluoride and sulfate concentrations, and total organic carbon, all influence aluminum speciation and its subsequent bioavailability to aquatic life. Calcium [hardness] concentrations in surface water may also reduce aluminum toxicity by competing with monomeric aluminum (Al3+) binding to negatively charged fish gills.

(a) **WQO.** State of California Department of Public Health (DPH) has established Secondary Maximum Contaminant Levels (MCLs) to assist public drinking water systems in managing their drinking water for aesthetic conditions such as taste, color, and odor. The Secondary MCL for aluminum is 200 µg/L for protection of the MUN beneficial use. Title 22 requires compliance with Secondary MCLs on an annual average basis.

The Code of Federal Regulations promulgated criteria for priority toxic pollutants for California's surface waters as part of section 131.38 Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California (California Toxics Rule or CTR), including metals criteria. However, aluminum criteria were not promulgated as part of the CTR. Absent numeric aquatic life criteria for aluminum, WQBEL's in the Central Valley Region's NPDES permits are based on the Basin Plans' narrative toxicity objective. The Basin Plans' *Policy for Application of Water Quality Objectives* requires the Central Valley Water Board to consider, "*on a case-by-case basis, direct evidence of beneficial use impacts, all material and relevant information submitted by the discharger and other interested parties, and relevant numerical criteria and guidelines developed and/or published by other agencies and organizations. In considering such criteria, the Board evaluates whether the specific numerical criteria which are available through these sources and through other information supplied to the Board, are relevant and appropriate to the situation at hand and, therefore, should be used in determining compliance with the narrative objective*." Relevant information includes, but is not limited to (1) USEPA Ambient Water Quality Criteria (NAWQC) and subsequent Correction, (2) site-specific conditions of the receiving water, and (3) site-specific aluminum studies conducted by dischargers within the Central Valley Region. (Basin Plan, p. IV.-17.00; see also, 40 CFR 122.44(d)(vi).)

USEPA NAWQC. USEPA recommended the NAWQC aluminum acute criterion at 750 µg/L based on test waters with a pH of 6.5 to 9.0. USEPA also recommended the NAWQC aluminum chronic criterion at 87 µg/L based upon the following two toxicity tests. All test waters contained hardness at 12 mg/L as $CaCO_3$.

(1) Acute toxicity tests at various aluminum doses were conducted in various acidic waters (pH 6.0 – 6.5) on 159- and 160-day old striped bass. The 159-day old striped bass showed no mortality in waters with pH at 6.5 and aluminum doses at 390 µg/L, and the 160-day old striped bass showed 58% mortality at a dose of 174.4 µg/L in same pH waters. However, the 160-day old striped bass showed 98% mortality at aluminum dose of 87.2 µg/L in waters with pH at 6.0, which is USEPA's basis for the 87 µg/L chronic criterion. The varied results draw into question this study and the applicability of the NAWQC chronic criterion of 87 µg/L.

(2) Chronic toxicity effects on 60-day old brook trout were evaluated in circumneutral pH waters (6.5-6.9 pH) in five cells at various aluminum doses (4, 57, 88, 169, and 350 µg/L). Chronic evaluation started upon hatching of eyed eggs of brook trout, and their weight and length were measure after 45 days and 60 days. The 60-day old brook trout showed 24% weight loss at 169 µg/L of aluminum and 4% weight loss at 88 µg/L of aluminum, which is the basis for USEPA's

chronic criteria. Though this test study shows chronic toxic effects of 4% reduction in weight after exposure for 60-days, the chronic criterion is based on 4-day exposure; so again, the applicability of the NAWQC chronic criterion of 87 µg/L is questionable.

Site-specific Conditions. USEPA advises that a water effects ratio may be more appropriate to better reflect the actual toxicity of aluminum to aquatic organisms when the pH and hardness conditions of the receiving water are not similar to that of the test conditions.[1] Effluent and Sacramento River monitoring data indicate that the pH and hardness values are not similar to the low pH and hardness conditions under which the chronic criterion for aluminum was developed, as shown in the table below, and therefore, the Central Valley Water Board does not expect aluminum to be as toxic in the Sacramento River as in the previously described toxicity tests. The pH of Sacramento River, the receiving water, ranged from 7.2 to 10.5 with a median of 7.65 based on 161 monitoring results obtained between 2 May 2013 and 26 May 2016. These water conditions typically are circumneutral pH where aluminum is predominately in the form of $Al(OH)_3$ and non-toxic to aquatic life. The hardness of Sacramento River ranged from 35.4 mg/L to 53.5 mg/L, based on 42 samples from 6 May 2013 to 3 May 2016, which is above the conditions, and thus less toxic, than the tests used to develop the chronic criterion.

Parameter	Units	Test Conditions for Applicability of Chronic Criterion	Effluent	Receiving Water (Upstream)
pH	standard units	6.0 – 6.5	5.95 - 7.39 (one-time minimum, 3.96)	7.2 – 8.3 (one-time maximum, 10.5)
Hardness, Total (as $CaCO_3$)	mg/L	12	50.9 - 105	35.4 – 53.5
Aluminum, Total Recoverable	µg/L	87.2 - 390	8.3 - 173	21.9 - 498

Local Environmental Conditions and Studies. Twenty-one site-specific aluminum toxicity tests have been conducted within the Central Valley Region. The pH and hardness of the Sacramento River are similar, as shown in the table below, and thus the results of these site-specific aluminum toxicity tests are relevant and appropriate for the Sacramento River. As shown in the following table, all EC_{50}[2] toxicity study result values are at concentrations of aluminum above 5,000 µg/L. Thus, the toxic effects of aluminum in these surface waters and in the Sacramento River, is less toxic (or less reactive) to aquatic species then demonstrated in the toxicity tests that USEPA used for the basis of establishing the chronic

[1] "*The value of 87 micro-g/L is based on a toxicity test with striped bass in water with pH = 6.5-6.6 and hardness < 10 mg/L. Data in [a 1994 Study] indicate that aluminum is substantially less toxic at higher pH and hardness, but the effects of pH and hardness are not well quantified at this time.*" USEPA 1999 NAWQC Correction, Footnote L

[2] The effect concentration is a point estimate of the toxicant concentration that would cause an observable adverse effect (e.g. death, immobilization, or serious incapitation) in a given percent of the test organisms, calculated from a continuous model (e.g. Probit Model). EC_{50} is a point estimate of the toxicant concentration that would cause an observable adverse effect in 50 percent of the test organisms. The EC_{50} is used in toxicity testing to determine the appropriate chronic criterion.

criterion of 87 µg/L. This new information, and review of the toxicity tests USEPA used to establish the chronic criterion, indicates that 87 µg/L is overly stringent and not applicable to the Sacramento River.

Central Valley Region Site-Specific Aluminum Toxicity Data

Discharger	Test Waters	Hardness Value	Total Aluminum EC_{50} Value	pH	WER
***Oncorhynchus mykiss* (rainbow trout)**					
Manteca	Surface Water/Effluent	124	>8600	9.14	N/C
Auburn	Surface Water	16	>16500	7.44	N/C
Modesto	Surface Water/Effluent	120/156	>34250	8.96	>229
Yuba City	Surface Water/Effluent	114/164[1]	>8000	7.60/7.46	>53.5
***Ceriodaphnia dubia* (water flea)**					
Auburn	Effluent	99	>5270	7.44	>19.3
	Surface Water	16	>5160	7.44	>12.4
Manteca	Surface Water/Effluent	124	>8800	9.14	N/C
	Effluent	117	>8700	7.21	>27.8
	Surface Water	57	7823	7.58	25.0
	Effluent	139	>9500	7.97	>21.2
	Surface Water	104	>11000	8.28	>24.5
	Effluent	128	>9700	7.78	>25.0
	Surface Water	85	>9450	7.85	>25.7
	Effluent	106	>11900	7.66	>15.3
	Surface Water	146	>10650	7.81	>13.7
Modesto	Surface Water/Effluent	120/156	31604	8.96	211
Yuba City	Surface Water/Effluent	114/164[1]	>8000	7.60/7.46	>53.5
Placer County (SMD 1)	Effluent	150	>5000	7.4 – 8.7	>13.7
***Daphnia magna* (water flea)**					
Manteca	Surface Water/Effluent	124	>8350	9.14	N/C
Modesto	Surface Water/Effluent	120/156	>11900	8.96	>79.6
Yuba City	Surface Water/Effluent	114/164[1]	>8000	7.60/7.46	>53.5

The Discharger has not conducted a toxicity test for aluminum; however, the City of Auburn conducted toxicity tests in the Auburn Ravine. As shown, the test water quality characteristics of the Auburn Ravine near Auburn are similar for pH and hardness in the Sacramento River; however Auburn Ravine hardness is less than Sacramento River hardness, with the hardness valued at 16 mg/L as $CaCO_3$ in comparison to the hardness of the Sacramento River near the discharge that averages 47.7 mg/L as $CaCO_3$. Thus, results of the site-specific study conducted on the Auburn Ravine near Auburn are representative of the Sacramento River near the discharge. Therefore, the City of Auburn aluminum toxicity test study is relevant for use in determining the specific numerical criteria to be used in determining compliance with the Basin Plan's narrative toxicity objective. The City of Auburn aluminum toxicity study resulted in a minimum site-specific aluminum objective of >5,160 µg/L. Thus, these results support the conclusion that the 87 µg/L chronic criterion is overly stringent for the Sacramento River near the discharge.

Applicable WQOs. This Order implements the Secondary MCL of 200 µg/L as an annual average for the protection of MUN and implements the Basin Plan's narrative toxicity objective for the protection of aquatic life using an acute (1-hour) criterion and chronic (4-day) criterion of 750 µg/L based on USEPA's NAWQC and the discussion above.

(b) **RPA Results.** The maximum effluent concentration (MEC) for total recoverable aluminum was 173 µg/L while the maximum observed upstream receiving water concentration was 498 µg/L. The maximum calendar annual average effluent concentration for total recoverable aluminum was 38 µg/L while the maximum observed upstream receiving water calendar annual average aluminum concentration in the receiving water was 102 µg/L. Therefore, aluminum in the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the secondary MCL or the narrative toxicity objective.

ii. **Temperature**

(a) **WQO**. The Basin Plan's temperature objective for intrastate waters states that natural receiving water temperature shall not be altered unless it can be demonstrated to the satisfaction of the Regional Water Board that such alteration in temperature does not adversely affect beneficial uses. Furthermore, for intrastate waters designated as COLD and WARM, temperature shall not be increased by more than 5°F above natural receiving water temperature. The Basin Plan has also established a site-specific temperature objective for the Sacramento River from Shasta Dam to I Street Bridge as follows: *The temperature shall not be elevated above 56°F in the reach from Keswick Dam to Hamilton City nor above 68°F in the reach from Hamilton City to the I Street Bridge during periods when the temperature increases will be detrimental to the fishery*. The Facility outfall is located within the reach from Keswick Dam to Hamilton City.

RPA Results. Treated domestic wastewater is an elevated temperature waste, which could cause or threaten to cause the receiving water temperature to exceed temperature objectives established in the Basin Plan. 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. Temperature 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 WQBEL's are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBEL's for pathogens in all permits for POTW's 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 highest daily temperature of the discharge was more than 30°F above the natural receiving water temperature. In addition, the receiving water exceeds the temperature of 56°F during times when the temperature increases will be detrimental to the fishery. The Discharger's 2013 Mixing Zone Study evaluated the effects of the Facility discharge on receiving water temperature. The Study concluded that at 500 feet downstream and under 7Q10 low river flow conditions the discharge had the potential to increase ambient temperature by only 0.1°F. The conclusions were derived utilizing "worst-case and average mixed temperature evaluations." However, the Study utilized a maximum effluent temperature of 67.8°F and a receiving water temperature of 56°F to project the change in temperature at 500 feet downstream of the discharge. Temperature data collected during the term of past permit shows that the receiving water routinely exceeds the 56°F temperature objective during the summer months and that effluent temperature is consistently above 75°F during the summer months and has reached a maximum of 78.3°F.

The temperature regime in the Sacramento River is dominated by upstream reservoir operations. Instream monitoring data collected by the Discharger upstream and downstream of the discharge during the past permit term demonstrates compliance with the Basin Plan objective of "no increase by more than 5°F above natural receiving water temperature." Although the receiving water is, at times, out of compliance with the 56°F objective, the Discharger's receiving water monitoring data indicates the effect of the effluent temperature on the receiving water is insignificant. Therefore the effluent temperature is not causing or contributing to an exceedance of the Basin Plan's objective and temperature effluent limitations are not necessary at this time.

c. **Constituents with No Data or Insufficient Data.** Reasonable potential cannot be determined for the following constituents because effluent data are limited or ambient 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. **Indeno (1,2,3-cd) pyrene**

(a) **WQO.** The CTR includes a criterion of 0.0044 µg/L for indeno (1,2,3-cd) pyrene for the protection of human health for waters from which both water and organisms are consumed.

(b) **RPA Results.** The maximum effluent concentration (MEC) for indeno (1,2,3-cd) pyrene was 0.06 µg/L while the maximum observed upstream receiving water concentration was <0.04 µg/L (non-detect). The MEC occurred in May 2013 and indeno (1,2,3-cd) pyrene has not been detected in more recent effluent sampling.

Sample Date	Method Detection Level (MDL)	Reporting Level (RL)	SIP Minimum Level	Indeno(1,2,3-cd)pyrene Effluent Result
6 May 2013	0.05	0.05	0.05	0.06
6 August 2013	0.4	0.4	0.05	Non Detect
27 August 2014	0.04	0.05	0.05	Non Detect
26 August 2015	0.04	0.05	0.05	Non Detect

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. Instead of limitations, additional monitoring has been established for indeno (1,2,3-cd) pyrene in both the effluent and the receiving water. Should monitoring results indicate that the discharge has the reasonable potential to cause or contribute to an exceedance of a water quality standard; this Order may be reopened and modified by adding an appropriate effluent limitation.

d. **Constituents with Reasonable Potential.** The Central Valley Water Board finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for ammonia, BOD_5, chlorine residual, chlorodibromomethane, copper, dichlorobromomethane, nitrate plus nitrite, pathogens, pH, and TSS. WQBEL's 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 1999 USEPA National Ambient Water Quality Criteria (NAWQC) for the protection of freshwater aquatic life for total ammonia (the "1999 Criteria"), 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.

The USEPA recently published national recommended water quality criteria for the protection of aquatic life from the toxic effects of ammonia

in freshwater (the "2013 Criteria")[1]. The 2013 Criteria is an update to USEPA's 1999 Criteria, and varies based on pH and temperature. Although the 2013 Criteria reflects the latest scientific knowledge on the toxicity of ammonia to certain freshwater aquatic life, including new toxicity data on sensitive freshwater mussels in the Family Unionidae, the species tested for development of the 2013 Criteria may not be present in some Central Valley waterways. The 2013 Criteria document therefore states that, "*unionid mussel species are not prevalent in some waters, such as the arid west …*" and provides that, "*In the case of ammonia, where a state demonstrates that mussels are not present on a site-specific basis, the recalculation procedure may be used to remove the mussel species from the national criteria dataset to better represent the species present at the site.*"

The Central Valley Water Board issued a 3 April 2014 *California Water Code Section 13267 Order for Information: 2013 Final Ammonia Criteria for Protection of Freshwater Aquatic Life* (13267 Order) requiring the Discharger to either participate in an individual or group study to determine the presence of mussels or submit a method of compliance for complying with effluent limitations calculated assuming mussels present using the 2013 Criteria. The Discharger submitted a letter to the Central Valley Water Board indicating their participation in the Central Valley Clean Water Association Freshwater Collaborative Mussel Study. Studies are currently underway to determine how the latest scientific knowledge on the toxicity of ammonia reflected in the 2013 Criteria can be implemented in the Central Valley Region as part of a Basin Planning effort to adopt nutrient and ammonia objectives. Until the Basin Planning process is completed, the Central Valley Water Board will continue to implement the 1999 Criteria to interpret the Basin Plan's narrative toxicity objective. The 1999 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 8.0, as the Basin Plan objective for pH in the receiving stream is the range of 6.5 to 8.5 and the Discharger has requested a maximum pH limit of 8.0. In order to protect against the worst-case short-term exposure of an organism, a pH value of 8.0 was

[1] *Aquatic Life Ambient Water Quality Criteria for Ammonia – Freshwater*, published August 2013 [EPA 822-R-13-001]

used to derive the acute criterion. The resulting acute criterion is 5.62 mg/L.

Downstream receiving water temperature and pH data from the Discharger's monthly monitoring reports from May 2013 through May 2016 were used to develop the chronic criteria. Using downstream receiving water data, the 30-day CCC was calculated for each day when temperature and pH were measured. The resulting lowest 99.9% 30-day average CCC is 2.80 mg/L (as N) for the discharge to the Sacramento River. 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 2.80 mg/L (as N), the 4-day average concentration that should not be exceeded is 6.99 mg/L (as N) for the discharge to the Sacramento River.

(b) **RPA Results.** The Facility is a POTW that treats domestic wastewater. Untreated domestic wastewater contains ammonia in concentrations that, without treatment, would be harmful to fish and would violate the Basin Plan narrative toxicity objective if discharged to the receiving water. Reasonable potential therefore exists and effluent limitations are required.

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. Ammonia 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 WQBEL's are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBEL's for pathogens in all permits for POTW's 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 POTW's, USEPA recommends that, "*POTW's should also be characterized for the possibility of chlorine and ammonia problems.*" (TSD, p. 50)

Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrite or nitric oxide and then to nitrous oxide or nitrogen gas, which is then released to the atmosphere. The Discharger currently uses nitrification to remove ammonia from the waste stream. 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. Discharges of ammonia in concentrations that produce detrimental physiological responses to human, plant, animal, or aquatic life would violate the Basin Plan narrative toxicity objective. Although the Discharger nitrifies the discharge, inadequate or incomplete nitrification creates the potential for ammonia to be discharged and provides the basis for the discharge to have a reasonable potential to cause or contribute to an in-stream excursion above the NAWQC. Therefore, the Central Valley Water Board finds the discharge has reasonable potential for ammonia and WQBEL's are required.

(c) **WQBEL's.** The Central Valley Water Board calculates WQBEL's 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 average weekly effluent limitation (AWEL). The remainder of the WQBEL calculation for ammonia was performed according to the SIP procedures. This Order contains a final average monthly effluent limitation (AMEL) and an average weekly effluent limitation (AWEL) for ammonia of 2.80 mg/L and 4.83 mg/L, respectively, based on the NAWQC for the protection of freshwater aquatic life for discharges to the Sacramento River.

(d) **Plant Performance and Attainability.** Facility ammonia effluent data from May 2013 through May 2016 is summarize below:

Minimum	<0.1 mg/L
Maximum	12.5 mg/L
Median	0.065 mg/L
Average	0.211 mg/L
Standard Deviation	1.177 mg/L
No. of Non-Detects (<0.1)	140
No. of Samples	159

Analysis of the effluent data shows that immediate compliance with these effluent limitations is feasible.

ii. **Biochemical Oxygen Demand (BOD_5) and Total Suspended Solids (TSS)**

(a) **WQO.** There are no applicable water quality objectives for BOD_5 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. BOD_5 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 BOD_5 and TSS. Unless properly treated, the discharge of BOD_5 and TSS can cause or contribute to the applicable water quality objectives in the receiving water.

(c) **WQBEL's.** There are no numeric water quality objectives that are available to calculate WQBELs for BOD_5 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 BOD_5 and TSS loading rates and the corresponding removal rate of the system. The advanced-secondary treatment process removes BOD_5 and TSS and these compounds are used as indicators of the effectiveness of the treatment processes. Consequently, this Order includes effluent limits for BOD_5 and TSS that reflect the technical capability of the advanced-secondary (or tertiary) filtration process, protect the beneficial uses of the receiving water, and minimize degradation.

This Order contains Average Monthly Effluent Limitations and Average Weekly Effluent Limitations for BOD_5 and TSS of 10 mg/L and 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 BOD_5 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 Performance and 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 mg/L and 0.019 mg/L, respectively. These criteria are protective of the Basin Plan's narrative toxicity objective.

(b) **RPA Results.** The concentrations of chlorine used to disinfect wastewater are high enough to harm aquatic life and violate the Basin Plan narrative toxicity objective if discharged to the receiving water. Reasonable potential therefore does exist and effluent limits are required.

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 WQBEL's are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBEL's for pathogens in all permits for POTW's 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 POTW's, USEPA recommends that, "*POTW's should also be characterized for the possibility of chlorine and ammonia problems.*" (TSD, p. 50)

The Discharger uses chlorine for disinfection, which is extremely toxic to aquatic organisms. Although the Discharger uses a sulfur dioxide process to dechlorinate the effluent prior to discharge to the Sacramento River, the existing chlorine use and the potential for chlorine to be discharged provides the basis for the discharge to have a reasonable potential to cause or contribute to an in-stream excursion above the NAWQC.

(c) **WQBEL's.** 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 mg/L and 0.019 mg/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 chlorine residual effluent data shows that immediate compliance with these effluent limitations is feasible.

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.** The maximum effluent concentration (MEC) for chlorodibromomethane was 1.67 µg/L while the maximum observed upstream receiving water concentration was <0.06 µg/L (non-detect). Therefore, chlorodibromomethane in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for the protection of human health.

(c) **WQBEL's.** The receiving water contains assimilative capacity for chlorodibromomethane, therefore, a dilution credit of 9:1 was allowed in the development of the WQBEL's for chlorodibromomethane. This Order contains a final average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for chlorodibromomethane of 3.56 µg/L and 7.20 µg/L, respectively, based on the CTR criterion for the protection of human health.

(d) **Plant Performance and Attainability.** Analysis of the chlorodibromomethane effluent data shows that immediate compliance with these effluent limitations is feasible.

v. **Copper, Total Recoverable**

(a) **WQO.** The Basin Plan and CTR include hardness-dependent criteria for the protection of freshwater aquatic life for copper. These criteria for copper are presented in dissolved concentrations, as a maximum concentration, 1-hour acute criteria, and 4-day chronic criteria. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. Default USEPA translators were used for the receiving water and effluent.

(b) **RPA Results.** Section IV.C.2 of this Fact Sheet includes procedures for conducting the RPA for hardness-dependent CTR metals, such as copper. The Basin Plan and CTR include hardness-dependent criteria for copper for the receiving water. The maximum observed upstream receiving water total recoverable copper concentration was 6.9 µg/L, based on 38 samples collected between May 2013 and May 2016. The maximum observed upstream receiving water dissolved copper concentration was 3.6 µg/L, based on 37 samples collected between May 2013 and May 2016. The RPA was conducted using the upstream receiving water hardness to calculate the criteria for comparison to the maximum ambient background dissolved concentration, and likewise using the reasonable

worst-case downstream hardness to compare the maximum effluent concentration. The table below shows the specific criteria used for the RPA.

	CTR Chronic Criterion (Dissolved/Total Recoverable)	Maximum Concentration (Dissolved/Total Recoverable)	Reasonable Potential? (Y/N)
Receiving Water	3.7/3.8 µg/L[1]	3.6/6.9 µg/L	Yes[4]
Effluent	5.0/5.2 µg/L[2]	29 µg/L[5]	Yes[3]

[1] Based on lowest observed upstream hardness of 35.4 mg/L (as $CaCO_3$)
[2] Based on reasonable worst-case downstream hardness of 50 mg/L (as $CaCO_3$)
[3] Per Section 1.3, step 4 of the SIP.
[4] Per Section 1.3, step 6 of the SIP.
[5] Total Recoverable only.

Based on the available data, copper in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the site-specific Basin Plan Objective and the CTR criteria for the protection of freshwater aquatic life.

(c) **WQBEL's.** The receiving water contains assimilative capacity for copper, therefore, a dilution credit of 8:1 (acute) and 12:1 (chronic) was allowed in the development of the WQBEL's for copper. This Order contains a final average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for total recoverable copper of 20.2 µg/L and 32.0 µg/L, respectively, based on the CTR criterion for the protection of freshwater aquatic life.

(d) **Plant Performance and Attainability.** Analysis of the total recoverable copper effluent data shows that immediate compliance with these effluent limitations is feasible.

vi. **Diazinon and Chlorpyrifos**

(a) **WQO.** The Central Valley Water Board completed a TMDL for diazinon and chlorpyrifos in the Sacramento – San Joaquin Delta Waterways and amended the Basin Plan to include diazinon and chlorpyrifos WLA's and water quality objectives. The Basin Plan Amendment for the Control of Diazinon and Chlorpyrifos Runoff into the Sacramento – San Joaquin Delta was adopted by the Central Valley Water Board on 23 June 2006 and became effective on 10 October 2007.

The amendment modified Basin Plan Chapter III (Water Quality Objectives) to establish site-specific numeric objectives for diazinon and chlorpyrifos in the Delta waterways and identified the requirements to meet the additive formula already in Basin Plan Chapter IV (Implementation) for the additive toxicity of diazinon and chlorpyrifos.

The amendment states that "*The Waste Load Allocations (WLA) for all NPDES-permitted dischargers…shall not exceed the sum (S) of one (1) as defined below.*

$$S = \frac{C_d}{WQO_d} + \frac{C_c}{WQO_c} \leq 1.0$$

Where:

C_D = diazinon concentration in µg/L of point source discharge for WLA…

C_C = chlorpyrifos concentration in µg/L of point source discharge for the WLA…

WQO_d = acute or chronic diazinon water quality objective in µg/L.

WQO_c = acute or chronic chlorpyrifos water quality objective in µg/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."

Appendix A of the Diazinon and Chlorpyrifos TMDL lists waterways subject to the TMDL and includes the Sacramento River.

The water quality objectives for chlorpyrifos are 0.025 µg/L as a 1-hour average (acute) and 0.015 µg/L as a 4-day average (chronic), not to be exceeded more than once in a 3-year period. The water quality objectives for diazinon are 0.16 µg/L as a 1-hour average (acute) and 0.10 µg/L as a 4-day average (chronic), not to be exceeded more than once in a 3-year period."

(b) **RPA Results.** Effluent and receiving water monitoring data for diazinon and chlorpyrifos is not available. However, due to the TMDL for diazinon and chlorpyrifos in the Sacramento River, WQBELs for these constituents are required. The TMDL waste load allocation applies to all NPDES dischargers to the Sacramento and Feather Rivers and will serve as the basis for WQBELs.

(c) **WQBEL's.** WQBEL's for diazinon and chlorpyrifos are required based on the TMDL for diazinon and chlorpyrifos for the Sacramento – San Joaquin Delta. Therefore, this Order includes effluent limits calculated based on the WLA's contained in the TMDL, as follows:

(1) Average Monthly Effluent Limitation (AMEL)

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

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

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

(2) Average Weekly Effluent Limitation (AWEL)

$$S_{AWEL} = \frac{C_{D\ W-avg}}{0.14} + \frac{C_{C\ W-avg}}{0.021} \leq 1.0$$

$C_{D\ W-avg}$ = average weekly diazinon effluent concentration in µg/L.

$C_{C\ W-avg}$ = average weekly 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. The Discharger does not add chlorpyrifos or diazinon to the treatment process.

vii. **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.** The maximum effluent concentration (MEC) for dichlorobromomethane was 13.4 µg/L while the maximum observed upstream receiving water concentration was <0.06 µg/L (non-detect). Therefore, dichlorobromomethane in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for the protection of human health.

(c) **WQBEL's**. The receiving water contains assimilative capacity for dichlorobrmomemethane, therefore, a dilution credit of 30:1 was allowed in the development of the WQBEL's for dichlorobromomethane. This Order contains a final average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for dichlorobromomethane of 15.6 µg/L and 29.2 µg/L, respectively, based on the CTR criterion for the protection of human health.

(d) **Plant Performance and Attainability.** Analysis of the dichlorobromomethane effluent data shows that immediate compliance with these effluent limitations is feasible.

viii. **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).

(b) **RPA Results.** The Facility is a POTW that treats domestic wastewater. Untreated domestic wastewater contains ammonia in concentrations that, if untreated, will be harmful to fish and will violate the Basin Plan's narrative toxicity objective. This Order, therefore, requires removal of ammonia (i.e., nitrification). Nitrification is a biological process that converts ammonia to nitrate and nitrite, and will result in effluent nitrate concentrations above the Primary MCL for nitrate plus nitrite. Nitrate concentrations in a drinking water supply above the Primary MCL threatens the health of human fetuses and newborn babies by reducing the oxygen-carrying capacity of the blood (methemoglobinemia). Reasonable potential for nitrate and nitrite therefore exists and WQBEL's are required.

Federal regulations at 40 C.F.R. section 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. Nitrate and nitrite are not priority pollutants. 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 WQBEL's are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBEL's for pathogens in all permits for POTW's 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 POTW'S, USEPA recommends that, "POTW's should also be characterized for the possibility of chlorine and ammonia problems." (TSD, p. 50)

The concentration of nitrogen in raw domestic wastewater is sufficiently high that the resultant treated wastewater has a reasonable potential to exceed or threaten to exceed the Primary MCL for nitrate plus nitrite unless the wastewater is treated for nitrogen removal. Denitrification is a process that converts nitrate to nitrite or nitric oxide and then to nitrous oxide or nitrogen gas, which is then released to the atmosphere. The Discharger currently uses nitrification to remove ammonia and the Facility's activated sludge system has facilities (pre-anoxic zones and internal mixed liquor recycle) designed to achieve denitrification to remove nitrite and nitrate from the waste stream. However, the existing facilities and operations would have to be altered to reliably achieve denitrification such that the effluent nitrate + nitrite is consistently below 10 mg/L. Monitoring data from May 2013 through May 2016 indicates that the maximum effluent concentration (MEC) for nitrate was 14.6 mg/L (n=37 samples, average=8.8 mg/L, median=8.3 mg/L, minimum=3.1 mg/L) while the maximum observed upstream receiving water concentration was 1.4 mg/L. The maximum effluent concentration (MEC) for nitrite was 0.01 mg/L while the maximum observed upstream receiving water

concentration was <0.1 mg/L. Therefore, nitrate in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the narrative toxicity objective and the Primacy MCL and WQBEL's are required.

(c) **WQBEL's.** The receiving water contains assimilative capacity for nitrate plus nitrite, therefore, a dilution credit of 1:1 was allowed in the development of the WQBEL's for nitrate plus nitrite. This Order contains an average monthly effluent limitation (AMEL) and average weekly effluent limitation (AWEL) for nitrate plus nitrite of 19.9 µg/L and 27.7 µg/L, respectively, based on the Basin Plan's narrative chemical constituents objective for protection of the MUN beneficial use. These effluent limitations are included in this Order to assure the treatment process adequately nitrifies and denitrifies the waste stream to protect the beneficial use of municipal and domestic supply.

(d) **Plant Performance and Attainability.** Analysis of the nitrate and nitrite effluent data shows that immediate compliance with these effluent limitations is feasible.

ix. **Pathogens**

(a) **WQO.** In a letter to the Central Valley Water Board dated 8 April 1999, DDW 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 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. Based on a review of data submitted by the Discharger and the period of record for the flow monitoring stations on the Sacramento River, there is always greater than 20:1 (river flow to design effluent flow) dilution was available downstream of the outfall. Therefore, the DDW requirements are applicable to the discharge.

(c) **WQBEL's.** Pursuant to guidance from DDW, 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. 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 total coliform effluent data shows that immediate compliance with these effluent limitations is feasible.

x. **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.** Raw domestic wastewater inherently has variable pH. Additionally, some wastewater treatment processes can increase or decrease wastewater pH which if not properly controlled, would violate the Basin Plan's numeric objective for pH in the receiving water. Therefore, reasonable potential exists for pH and WQBEL's are required.

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 WQBEL's are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBEL's for pathogens in all permits for POTW's 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 Facility is a POTW that treats domestic wastewater. Based on 1127 samples taken from 1 May 2013 to 31 May 2016, the maximum effluent pH reported was 7.39 and the minimum was 3.96. The Facility was less than the instantaneous minimum effluent limitation on two occasions: 22 October 2015 and 3 September 2014. Since 1 May 2013, the maximum pH reported was 7.39. Based on 160 samples taken from 2 May 2013 to 26 May 2016, the maximum receiving water pH reported was 10.7 and the minimum was 7.31. The receiving water exceeded the the maximum pH receiving water limitation on one occasion: 20 March 2014. Since 20 March 2014, the downstream receiving water's maximum pH reported was 8.3. Although the Discharger has proper pH controls in place, the pH for the Facility's influent varies due to the nature of municipal sewage, which provides the basis for the discharge to have a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's numeric objective for pH in the receiving water. Therefore, WQBEL's for pH are required in this Order. Furthermore, the

Discharger has requested the instantaneous maximum pH effluent limitation be set at 8.0 rather than 8.5. The lower pH limit results in a less stringent ammonia effluent limit. In the future the Discharger may request re-establishment of the 8.5 limit.

(c) **WQBEL's.** Effluent limitations for pH of 6.0 as an instantaneous minimum and 8.0 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 pH data shows that immediate compliance with these effluent limitations is feasible.

xi. **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, livestock, 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. The Central Valley Water Board must determine the applicable numeric limit to implement the narrative objective for the protection of agricultural supply. 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.

Table F-12.Salinity Water Quality Criteria/Objectives

Parameter	Agricultural WQ Objective[1]	Secondary MCL[2]	USEPA NAWQC	Effluent	
				Average[3]	Maximum
EC (µmhos/cm)	Varies[2]	900, 1600, 2200	N/A	**417**	**568**
TDS (mg/L)	Varies	500, 1000, 1500	N/A	**254**	**300**
Sulfate (mg/L)	Varies	250, 500, 600	N/A	**26**	**30.4**
Chloride (mg/L)	Varies	250, 500, 600	860 1-hr 230 4-day	**49**	**52.8**

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

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

[3] Maximum calendar annual average.

(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.

(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 EC limit for the Sacramento River as follows: Electrical conductivity (at 25°C) shall not exceed 230 µmhos/cm (50 percentile) or 235 µmhos/cm (90 percentile) at Knights Landing above Colusa Basin Drain or 240 µmhos/cm (50 percentile) or 340 µmhos/cm (90 percentile) at I Street Bridge, based upon previous 10 years of record.

(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**.**

(b) **RPA Results.**

(1) **Chloride.** Chloride concentrations in the effluent ranged from 28.3 mg/L to 52.8 mg/L, with an average of 41.4 mg/L. These levels do not exceed the Secondary MCL. Background concentrations in the receiving water ranged from 1.96 mg/L to 3.54 mg/L, with an average of 2.5 mg/L, for 13 samples collected by the Discharger from 6 May 2013 through 3 May 2016.

(2) **Electrical Conductivity.** A review of the Discharger's monitoring reports shows an average effluent EC of 403 µmhos/cm, with a range from 230 µmhos/cm to 568 µmhos/cm. The receiving water has been consistently in compliance with the Basin Plan site-specific EC objectives for the Sacramento River above Knights Landing (EC averaged 129 µmhos/cm in the previous permit term) resulting in available assimilative capacity for consideration in the RPA. Utilizing a conservative mass balance approach where the receiving water flow is equal to 8314 cfs (harmonic mean), the effluent flow is equal to 26 mgd (maximum capacity), the receiving water EC concentration is 164 µmhos/cm (maximum recorded), and the effluent EC concentration is 568 µmhos/cm (maximum recorded), the resulting downstream EC concentration is 166 µmhos/cm. Considering the large dilution and assimilative capacity in the receiving water, the small increase in EC caused by the discharge does not result in a

reasonable potential to cause or contribute to an exceedance of the objectives for EC in the receiving water.

(3) **Sulfate.** Sulfate concentrations in the effluent ranged from 20.9 mg/L to 30.4 mg/L, with an average of 25.5 mg/L. These levels do not exceed the Secondary MCL. Background concentrations in the receiving water ranged from 2.67 mg/L to 6.91 mg/L, with an average of 3.68 mg/L.

(4) **Total Dissolved Solids.** The average TDS effluent concentration was 230 mg/L with concentrations ranging from 34.8 mg/L to 300 mg/L. These levels do not exceed the Secondary MCL. The background receiving water TDS ranged from 60.5 mg/L to 220 mg/L, with an average of 90.8 mg/L.

(c) **WQBEL's.** 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 salinity, the discharge does not have reasonable potential to cause or contribute to an in-stream excursion of water quality objectives for salinity. However, 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.

Allowing the Discharger to increase its current salt loading may be contrary to the Region-wide effort to address salinity in the Central Valley. In order to ensure that the Discharger will continue to control the discharge of salinity, this Order includes a requirement to continue to 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.

xii. **Zinc, Total Recoverable**

(a) **WQO.** The Basin Plan and CTR include hardness-dependent criteria for the protection of freshwater aquatic life for zinc. These criteria for zinc are presented in dissolved concentrations, as a maximum concentration, a 1-hour acute criteria, and a 4-day chronic criteria. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. Default USEPA translators were used for the receiving water and effluent.

(b) **RPA Results.** Section IV.C.2 of this Fact Sheet includes procedures for conducting the RPA for hardness-dependent CTR metals, such as zinc. The Basin Plan and CTR include hardness-dependent criteria for zinc for the receiving water. The maximum observed upstream receiving water total recoverable zinc concentration was 10 µg/L, based on 37 samples collected between May 2013 and April 2016. The RPA was conducted using the upstream receiving water hardness to calculate the criteria for comparison to the maximum ambient background concentration, and likewise using the reasonable worst-case downstream hardness to compare the maximum effluent concentration. The table below shows the specific criteria used for the RPA.

	Site-Specific Basin Plan Objective (Total Recoverable)	Maximum Concentration (Total Recoverable)	Reasonable Potential? (Y/N)
Receiving Water	14.8 µg/L[1]	10 µg/L	No[4]
Effluent	19.7 µg/L[2]	92.8 µg/L	Yes[3]

[1] Based on lowest observed upstream hardness of 35.4 mg/L (as $CaCO_3$)
[2] Based on reasonable worst-case downstream hardness of 50 mg/L (as $CaCO_3$)
[3] Per Section 1.3, step 4 of the SIP.
[4] Per Section 1.3, step 6 of the SIP.

Based on the available data, zinc in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above both the site-specific Basin Plan Objective and the CTR criteria for the protection of freshwater aquatic life.

(c) **WQBEL's.** The receiving water contains assimilative capacity for zinc, therefore, a dilution credit of 10:1 (acute) and 1:1 (chronic) was allowed in the development of the WQBEL's for total recoverable zinc. This Order contains a final average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for total recoverable zinc of 79.7 µg/L and 116.7 µg/L, respectively, based on the CTR criterion for the protection of freshwater aquatic life.

(d) **Plant Performance and Attainability.** Analysis of the effluent zinc data shows that immediate compliance with these effluent limitations is feasible.

4. WQBEL Calculations

a. This Order includes WQBEL's for ammonia, BOD_5, chlorine residual, chlorpyrifos, chlorodibromomethane, copper, diazinon, dichlorobromomethane, nitrate plus nitrite, pH, total coliform organisms, and TSS. The general methodology for calculating WQBEL's based on the different criteria/objectives is described in subsections IV.C.5.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 WQBEL's 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.** WQBEL's 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. LTAacute and LTAchronic) using statistical multipliers and the lowest LTA is used to calculate the AMEL and MDEL using additional statistical multipliers.

e. **Human Health Criteria.** WQBEL's based on human health criteria, are also calculated in accordance with Section 1.4 of the SIP. The AMEL is set equal to ECA and a statistical multiplier was used to calculate the MDEL.

LTA_{acute}

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

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

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

where:
$mult_{AMEL}$ = statistical multiplier converting minimum LTA to AMEL
$mult_{MDEL}$ = statistical multiplier converting minimum LTA to MDEL
M_A = statistical multiplier converting acute ECA to LTA_{acute}
M_C = statistical multiplier converting chronic ECA to $LTA_{chronic}$

Summary of Water Quality-Based Effluent Limitations
Discharge Point No. 001

Table F-13. 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]	734	1101	2202	--	--
pH	standard units	--	--	--	6.0	8.0
Total Suspended Solids	mg/L	10	15	30	--	--
	lbs/day[1]	734	1101	2202	--	--
Priority Pollutants						
Chlorodibromomethane	µg/L	3.56	--	7.20	--	--
Copper, Total Recoverable	µg/L	20.2	--	32.0	--	--
Dichlorobromomethane	µg/L	15.56	--	29.22	--	--
Zinc, Total Recoverable	µg/L	79.7	--	116.7	--	--
Non-Conventional Pollutants						
Ammonia Nitrogen, Total (as N)	mg/L	2.80	4.83	--	--	--
	lbs/day[1]	205	354	--	--	--
Chlorine, Total Residual	mg/L	--	0.011[2]	0.019[3]	--	--
Diazinon and Chlorpyrifos	µg/L	[4]	--	[5]	--	--
Nitrate Plus Nitrite (as N)	mg/L	19.9	27.7	--	--	--
Total Coliform Organisms	MPN/100 mL	--	23[6]	--	--	240[7]

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

[1] Based on an average dry weather flow of 8.8 million gallons per day (MGD).
[2] Applied as a 4-day average effluent limitation.
[3] Applied as a 1-hour average effluent limitation.
[4] Average Monthly Effluent Limitation

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

$C_{D\ M-AVG}$ = average monthly diazinon effluent concentration in µg/L.
$C_{C\ M-AVG}$ = average monthly chlorpyrifos effluent concentration in µg/L.

[5] Average Weekly Effluent Limitation

$$S_{AWEL} = \frac{C_{D\ W-AVG}}{0.14} + \frac{C_{C\ W-AVG}}{0.021} \leq 1.0$$

$C_{D\ W-AVG}$ = average weekly diazinon effluent concentration in µg/L.
$C_{C\ W-AVG}$ = average weekly chlorpyrifos effluent concentration in µg/L.
[6] Applied as a 7-day median effluent limitation.
[7] Not to be exceeded more than once in any 30-day period.

5. Whole Effluent Toxicity (WET)

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

a. **Acute Aquatic Toxicity.** The Basin Plan contains a narrative toxicity objective that states, "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at page III-8.00) The Basin Plan also states that, *"…effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate…*".

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 WQBEL's are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBEL's for pathogens in all permits for POTW's discharging to contact recreational waters).*" The Discharger conducted monthly acute toxicity monitoring (test species: rainbow trout) during the term of the pervious Order. Test results were 100 percent survival for all but one test which resulted in 95% survival. 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). Since the Facility is a POTW that is categorized as a major facility, the influent can be highly variable due to commercial, industrial, and other inputs. Table F-14 below summarizes the whole effluent chronic toxicity testing results from the previous permit term.

Table F-14. Whole Effluent Chronic Toxicity Testing Results

	Fathead Minnow *Pimephales promelas*		**Water Flea** *Ceriodaphnia dubia*		**Green Algae** *Selenastrum capricornutum*
Date	Survival (TUc) EFF/RW	Growth (TUc) EFF/RW	Survival (TUc) EFF/RW	Reproduction (TUc) EFF/RW	Growth (TUc) EFF/RW
06/04/2013	1 / >1	1 / >1	1 / 1	**>1** / 1	1 / >1
06/25/2013	NA	NA	1 / 1	1 / 1	NA
07/09/2013	NA	NA	1 / 1	1 / 1	NA
07/23/2013	NA	NA	1 / 1	1 / 1	NA
08/06/2013	NA	NA	1 / 1	1 / 1	NA
10/22/2013	1 / >1	1 / 1	1 / 1	1 / 1	1 / >1
05/06/2014	1 / 1	1 / 1	1 / 1	**>1** / >1	1 / 1
06/03/2014	NA	NA	1 / 1	1 / 1	NA
6/17/2014	NA	NA	1 / 1	1 / 1	NA
07/01/2014	NA	NA	1 / 1	1 / 1	NA
07/08/2014	NA	NA	1 / 1	1 / 1	NA
09/09/2014	1 / 1	1 / 1	1 / 1	1 / 1	1 / 1
05/11/2015	1	1	1	1	1
12/07/2015	1	1	1	1	1
05/16/2016	1	1	1	1	1

EFF: Effluent, RW: Upstream Receiving Water.
A result of 1 TUc indicates no observable effect at 100% sample concentration.
All non-control testing performed using undiluted final effluent taken from the Facility.
Receiving water control group testing performed using undiluted receiving water at RSW-001.

As noted in Table F-14 above, the discharge exhibited chronic toxicity only for Ceriodapnia dubia reproduction twice during the previous permit term. A >1 TUc result was recorded during the 6/4/2013 sampling event and the 5/6/2014 sampling event. The Central Valley Water Board finds that the discharge does not exhibit reasonable potential to cause or contribute to an exceedance of the Basin Plan's narrative toxicity objective for the following reasons:

1) The Discharger performed accelerated monitoring after both the 6/4/2013 and 5/6/2014 >1 TUc results. The accelerated monitoring consisted of four additional sampling events; one effluent sample every two weeks for eight weeks. In both cases, all samples collected during accelerated monitoring exhibited no toxicity to Ceriodaphnia dubia reproduction (i.e. 1 TUc)

2) The Discharger has been in the process of completing plant upgrades for the past ten years. Upgrades to the ponds, return pond capabilities, and filters were completed in November 2013, almost five months after the 6/4/13 >1 TUc result. The 5/6/14 >1 TUc result occurred within 6 months of completion of the November 2013 upgrades. Additionally, overall plant upgrades were not completed until April 2016 when the Discharger completed upgrades to the solids handling process. Upgrades to the solids handling process have likely had some effect on overall effluent quality because the centrate from the centrifuge is returned to the headworks for treatment. Overall, it is likely these upgrades to the treatment plant and adjustments in operating the new treatment plant have caused some variability in the effluent quality and this should be considered when evaluating whether the >1 TUc chronic toxicity results are truly representative of the discharge.

The Monitoring and Reporting Program of this Order requires semi-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 includes a numeric toxicity monitoring trigger, requirements for accelerated monitoring, and requirements for Toxicity Reduction Evaluation (TRE) initiation if toxicity is demonstrated.

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 accelerated monitoring and a TRE in accordance with an approved TRE workplan. The numeric toxicity monitoring trigger is not an effluent limitation; it is the toxicity threshold at which the Discharger is required to perform accelerated chronic toxicity monitoring, as well as, the threshold to initiate a TRE if effluent toxicity has been demonstrated. The numeric chronic toxicity monitoring trigger has been established as >2 chronic toxicity units (TUc).

D. Final Effluent Limitation Considerations

1. Mass-based Effluent Limitations

40 C.F.R section 122.45(f)(1) requires effluent limitations be expressed in terms of mass, with some exceptions, and 40 C.F.R. section 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 CF.R. section 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 MCL's) and mass limitations are not necessary to protect the beneficial uses of the receiving water.

Mass-based effluent limitations have been established in this Order for ammonia, BOD_5, and TSS because they are oxygen demanding substances. Except for the pollutants listed above, mass-based effluent limitations are not included in this Order for pollutant parameters for which effluent limitations are based on water quality objectives and criteria that are concentration-based.

Mass-based effluent limitations were calculated based upon the design flow (Average Dry Weather Flow) permitted in section IV.A.1.g. of this Order.

2. Averaging Periods for Effluent Limitations

40 C.F.R. section 122.45 (d) requires average weekly and average monthly discharge limitations for POTW's unless impracticable. For BOD_5, pH, TSS, chlorodibromomethane, copper, dichlorobromomethane, zinc, and chlorine residual, weekly average effluent limitations have been replaced or supplemented with effluent limitations utilizing shorter averaging periods. For the CTR priority pollutant constituents (i.e., chlorodibromomethane, copper, dichlorobromomethane, and zinc), a maximum daily effluent limitation has been applied in lieu of an average weekly effluent limitation in accordance with the SIP. The rationale for using shorter averaging periods for the non-priority pollutants (i.e., BOD, TSS, pH, and chlorine residual) is discussed in section IV.C.3 of this Fact Sheet.

3. Satisfaction of Anti-Backsliding Requirements

The CWA 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 CWA sections 402(o) or 303(d)(4), or, where applicable, 40 C.F.R. section 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, ammonia, zinc, aluminum, and narrative effluent limitation for chronic toxicity. The effluent limitations for these pollutants are less stringent than those in Order No. R5-2010-0096. This relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.

a. **CWA section 402(o)(1) and 303(d)(4).** CWA section 402(o)(1) prohibits the establishment of less stringent water quality-based effluent limits "*except in compliance with Section 303(d)(4).*" CWA section 303(d)(4) has two parts: paragraph (A) which applies to nonattainment waters and paragraph (B) which applies to attainment waters.

i. For waters where standards are not attained, CWA section 304(d)(4)(A) specifies that any effluent limit based on a TMDL or other WLA may be revised only if the cumulative effect of all such revised effluent limits based on such TMDL's or WLAs will assure the attainment of such water quality standards.

ii. For attainment waters, CWA section 303(d)(4)(B) specifies that a limitation based on a water quality standard may be relaxed where the action is consistent with the antidegradation policy.

The Sacramento River is considered an attainment water for copper, dichlorobromomethane, ammonia, zinc, and aluminum because the receiving water is not listed as impaired on the 303(d) list for these constituents.[1] As discussed in section IV.D.4, below, removal or relaxation of the effluent limits complies with federal and state antidegradation requirements. Thus, removal of the effluent limitation for aluminum and the relaxation of copper, zinc, ammonia, and dichlorobromomethane effluent limitations from Order No. R5-2010-0096 meets the exception in CWA section 303(d)(4)(B).

b. **CWA section 402(o)(2).** CWA section 402(o)(2) provides several exceptions to the anti-backsliding regulations. CWA 402(o)(2)(B)(i) allows a renewed, reissued, or modified permit to contain a less stringent effluent limitation for a pollutant if information is available which was not available at the time of permit issuance (other than revised regulations, guidance, or test methods) and which would have justified the application of a less stringent effluent limitation at the time of permit issuance.

As described further in section IV.C.3.b of this Fact Sheet, updated information that was not available at the time Order No. R5-2010-0096 was issued indicates that aluminum and whole effluent chronic toxicity do not exhibit reasonable potential to cause or contribute to an exceedance of water quality objectives in the receiving water. For ammonia, new information results in a different effluent limit calculation. Additionally, updated information that was not available at the time Order No. R5-2010-0096 was issued indicates that less stringent effluent limitations for copper, dichlorobromomethane, and zinc, based on available dilution credits satisfy requirements in CWA section 402(o)(2). The updated information that supports the relaxation of effluent limitations for these constituents includes the following:

i. **Aluminum.** Effluent monitoring data collected between May 2013 and May 2016 indicates that aluminum in the discharge does not exhibit reasonable potential to cause or contribute to an exceedance of the Secondary MCL.

ii. **Chronic Toxicity.** Effluent monitoring data collected between May 2013 and May 2016 indicates that the discharge does not exhibit reasonable potential to cause or contribute to an exceedance of the Basin Plan's narrative toxicity objective.

iii. **Ammonia.** In order to protect against the worst-case short-term exposure of an organism, the permitted maximum pH effluent limitation of 8.0 was used to derive the acute criterion for ammonia. Order No. R5-2010-0096 established ammonia limits based on ammonia criteria developed using a maximum permitted pH value of 8.5. This Order contains a more conservative maximum

[1] "The exceptions in Section 303(d)(4) address both waters in attainment with water quality standards and those not in attainment, i.e. waters on the section 303(d) impaired waters list." State Water Board Order WQ 2008-0006, Berry Petroleum Company, Poso Creek/McVan Facility.

pH effluent limitation, relative to the previous Order, which results in less stringent ammonia effluent limits.

iv. **Dichlorobromomethane.** Based on the dilution/mixing zone study conducted in 2013 and receiving water monitoring data collected between May 2013 and May 2016, a mixing zone and dilution credit of 30:1 is applicable and the receiving water contains assimilative capacity for dichlorobromomethane, as discussed in section IV.C.2.c of this Fact Sheet. Therefore, this Order includes less stringent average monthly effluent limitation for dichlorobromomethane based on the performance of the Facility and the available dilution.

v. **Copper.** Based on the dilution/mixing zone study conducted in 2013 and receiving water monitoring data collected between May 2013 and May 2016, a mixing zone and dilution credit of 8:1 (acute) and 12:1 (chronic) is applicable and the receiving water contains assimilative capacity for copper, as discussed in section IV.C.2.c of this Fact Sheet. Therefore, this Order includes less stringent effluent limitations for total recoverable copper based on the performance of the Facility and the available dilution.

vi. **Zinc.** Based on the dilution/mixing zone study conducted in 2013 and receiving water monitoring data collected between May 2013 and May 2016, a mixing zone and dilution credit of 10:1 (acute) and 1:1 (chronic) is applicable and the receiving water contains assimilative capacity for zinc, as discussed in section IV.C.2.c of this Fact Sheet. Therefore, this Order includes less stringent effluent limitations for total recoverable zinc based on the performance of the Facility and the available dilution.

Thus, removal or relaxation of the effluent limitations for copper, dichlorobromomethane, ammonia, zinc, and aluminum from Order R5-2010-0096 is in accordance with CWA section 402(o)(2)(B)(i), which allows for the removal of effluent limitations based on information that was not available at the time of permit issuance.

4. Antidegradation Policies

This Order does not allow for an increase in flow or mass of pollutants to the receiving water. Therefore, a complete antidegradation analysis is not necessary. The Order requires compliance with applicable federal technology-based standards and with WQBEL's 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 C.F.R. section 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 C.F.R. section 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. **Groundwater.** The Discharger utilizes concrete-lined flow equalization basins, unlined emergency storage basins, and lined-ponds to manage centrifuge centrate. Centrate is metered back to the influent lift station at regular intervals. Domestic wastewater contains constituents such as total dissolved solids (TDS), specific

conductivity, pathogens, nitrates, organics, metals and oxygen demanding substances (BOD). Centrifuge centrate contains similar wastewater constituents and also generally has high concentrations of ammonia. Percolation from the ponds may result in an increase in the concentration of these constituents in groundwater. The State Anti-Degradation Policy generally prohibits the Central Valley Water Board from authorizing activities that will result in the degradation of high-quality waters unless it has been shown that:

i. The degradation will not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives;

ii. The degradation will not unreasonably affect present and anticipated future beneficial uses;

iii. The discharger will employ Best Practicable Treatment or Control (BPTC) to minimize degradation; and

iv. The degradation is consistent with the maximum benefit to the people of the state.

Groundwater limitations have been included in this Order (at or below) the water quality objective for protection of the beneficial uses of the groundwater.

Some degradation of groundwater may be consistent with the State Anti-Degradation Policy provided that the Discharger is implementing best practicable treatment or control (BPTC) measures. The Facility is designed and constructed to route raw, untreated wastewater to the flow equalization basins and emergency storage basins to prevent excessive inflow to the plant and possible upset or bypass. This storage of untreated wastewater will be short in duration and may result in limited groundwater degradation not exceeding water quality objectives. Providing wastewater treatment to the community with flow equalization basins and emergency storage ponds in place to prevent upset or bypass of the wastewater treatment plant is in the best interest of the people of the state. The Discharger's treatment constitutes best practicable treatment or control and complies with the State Anti-Degradation Policy.

This Order requires the Discharger to conduct groundwater monitoring in order to ensure groundwater limitations are not exceeded. Groundwater limitations have been included in this Order (at or below) the water quality objective for protection of the domestic or municipal supply (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, pH, and percent removal requirements for BOD_5 and TSS. Restrictions on these constituents are discussed in section IV.B.2 of this Fact Sheet. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements. In addition, this Order contains effluent limitations more stringent than the minimum, federal technology-based requirements that are necessary to meet water quality standards.

This Order contains pollutant restrictions that are more stringent than applicable federal requirements and standards. Specifically, this Order includes effluent limitations for BOD_5, 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 Fact Sheet section IV.C.

Summary of Final Effluent Limitations
Discharge Point 001

Table F-15. Summary of Final Effluent Limitations

Parameter	Units	Effluent Limitations					Basis[1]
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
Flow	MGD	8.8[2]	--	--	--	--	DC
Conventional Pollutants							
Biochemical Oxygen Demand (5-day @ 20°C)	mg/L	10	15	30	--	--	TTC
	lbs/day[3]	734	1101	2202	--	--	
	% Removal	85	--	--	--	--	CFR
pH	standard units	--	--	--	6.0	8.0	CFR/BP
Total Suspended Solids	mg/L	10	15	20	--	--	TTC
	lbs/day[3]	734	1101	2202	--	--	
	% Removal	85	--	--	--	--	CFR
Priority Pollutants							
Chloro-dibromomethane	µg/L	3.56	--	7.20	--	--	CTR
Copper, Total Recoverable	µg/L	20.0	--	32.0	--	--	CTR
Dichloro-bromomethane	µg/L	15.56	--	29.22	--	--	CTR
Zinc, Total	µg/L	79.7	--	116.7	--	--	CTR
Non-Conventional Pollutants							
Ammonia Nitrogen, Total (as N)	mg/L	2.80	4.83	--	--	--	NAWQC
	lbs/day[3]	250	354	--	--	--	
Chlorine, Total Residual	mg/L	--	0.011[4]	0.019[5]	--	--	NAWQC
Diazinon and Chlorpyrifos	µg/L	[6]	--	[7]	--	--	TMDL
Nitrate Plus Nitrite (as N)	mg/L	19.9	27.7	--	--	--	MCL
Total Coliform Organisms	MPN/100 mL	--	23[8]	--	--	240[9]	DDW
Acute Toxicity	% Survival	--	--	70[10]/90[11]	--	--	BP

Parameter	Units	Effluent Limitations					Basis[1]
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	

[1] DC – Based on the design capacity of the Facility.
TTC – Based on tertiary treatment capability. These effluent limitations reflect the capability of a properly operated tertiary treatment plant.
CFR – Based on secondary treatment standards contained in 40 C.F.R. 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 U.S. EPA's National Ambient Water Quality Criteria for the protection of freshwater aquatic life.
TMDL – Based on the applicable TMDL.
PB – Based on Facility performance.
MCL – Based on the Primary Maximum Contaminant Level.
DDW – Based on Division of Drinking Water recommendation.

[2] The average dry weather flow shall not exceed 8.8 MGD.

[3] Based on an average dry weather flow of 8.8 million gallons per day (MGD).

[4] Applied as a 4-day average effluent limitation.

[5] Applied as a 1-hour average effluent limitation.

[6] Average Monthly Effluent Limitation

$$S_{AMEL} = \frac{C_{D\,M-AVG}}{0.079} + \frac{C_{D\,M-AVG}}{0.012} \leq 1.0$$

$C_{D\,M\text{-}AVG}$ = average monthly diazinon effluent concentration in µg/L.
$C_{C\,M\text{-}AVG}$ = average monthly chlorpyrifos effluent concentration in µg/L.

[7] Average Weekly Effluent Limitation

$$S_{AWEL} = \frac{C_{D\,W-AVG}}{0.14} + \frac{C_{C\,W-AVG}}{0.021} \leq 1.0$$

$C_{D\,W\text{-}AVG}$ = average weekly diazinon effluent concentration in µg/L.
$C_{C\,W\text{-}AVG}$ = average weekly chlorpyrifos effluent concentration in µg/L.

[8] Applied as a 7-day median effluent limitation.

[9] Not to be exceeded more than once in any 30-day period.

[10] 70% minimum of any one bioassay.

[11] 90% median for any three consecutive bioassays.

E. Interim Effluent Limitations – Not Applicable

F. Land Discharge Specifications – Not Applicable

G. Recycling Specifications – Not Applicable

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

A. Surface Water

1. CWA section 303(a-c), requires states to adopt water quality standards, including criteria where they are necessary to protect beneficial uses. The Central Valley Water Board adopted water quality criteria as water quality objectives in the Basin Plan. The Basin Plan states that "[t]*he numerical and narrative water quality objectives define the least stringent standards that the Regional Water Board will apply to regional waters in order to protect the beneficial uses.*" The Basin Plan includes numeric and narrative water quality objectives for various beneficial uses and water bodies. This Order contains

receiving surface water limitations based on the Basin Plan numerical and narrative water quality objectives for bacteria, biostimulatory substances, color, chemical constituents, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, salinity, suspended sediment, settleable substances, suspended material, tastes and odors, temperature, toxicity, and turbidity.

B. Groundwater

1. The beneficial uses of the underlying groundwater 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 PROVISIONS

A. Standard Provisions

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

Sections 122.41(a)(1) and (b) through (n) of 40 C.F.R. 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. Section 123.25(a)(12) of 40 C.F.R. allows the state to omit or modify conditions to impose more stringent requirements. In accordance with 40 C.F.R. section 123.25, this Order omits federal conditions that address enforcement authority specified in 40 C.F.R. sections 122.41(j)(5) and (k)(2) because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387(e).

B. Special Provisions

1. Reopener Provisions

a. **Mercury.** This provision allows the Central Valley 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 an applicable TMDL program is adopted. In addition, this Order may be reopened if the Central Valley 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 criteria for applicable 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.

2. Special Studies and Additional Monitoring Requirements

a. **Chronic Whole Effluent Toxicity Requirements.** The Basin Plan contains a narrative toxicity objective that states, "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at page III-8.00) Based on whole effluent chronic toxicity testing performed by the Discharger from May 2013 through May 2016, 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 and therefore no narrative chronic toxicity effluent limit is included in this Order. Instead, a numeric toxicity monitoring trigger is included in this Order as further described below.

This provision requires the Discharger to develop a TRE Workplan in accordance with USEPA guidance. In addition, the provision provides a numeric toxicity monitoring trigger and requirements for accelerated monitoring, as well as, requirements for TRE initiation if toxicity has been demonstrated.

Monitoring Trigger. A numeric toxicity monitoring trigger of >2 TUc (where TUc = 100/NOEC) is applied in the provision. Therefore, a TRE is triggered when the effluent exhibits toxicity at 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:

i. *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants*, EPA/833-B-99/002, August 1999.

ii. *Generalized Methodology for Conducting Industrial Toxicity Reduction Evaluations (TREs)*, EPA/600/2-88/070, April 1989.

iii. *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures, Second Edition*, EPA 600/6-91/003, February 1991.

iv. *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I*, EPA/600/6-91/005F, May 1992.

v. *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.

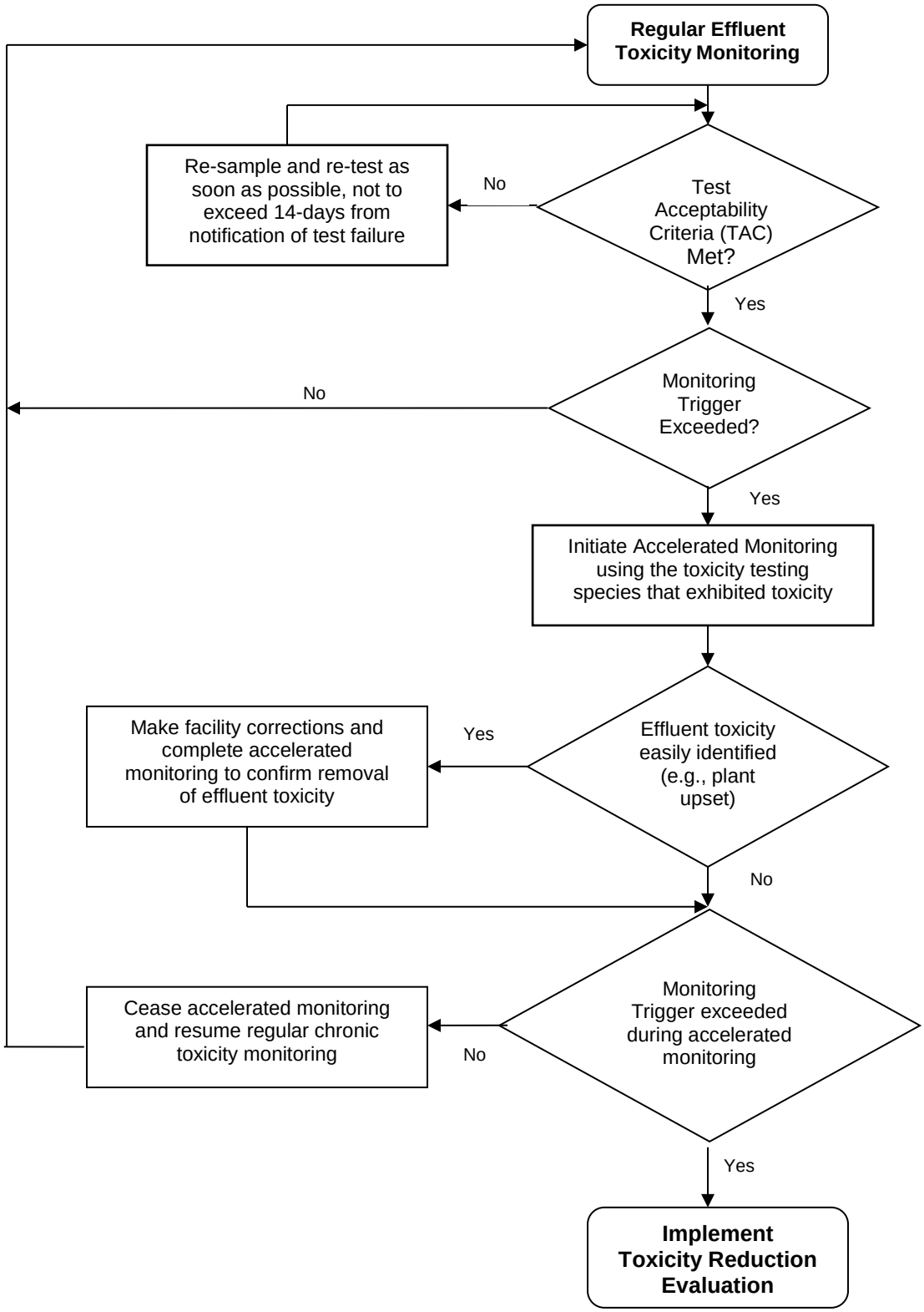
vi. *Methods for Aquatic Toxicity Identification Evaluations: Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity, Second Edition*, EPA 600/R-92/081, September 1993.

vii. *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.

viii. *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.

ix. *Technical Support Document for Water Quality-based Toxics Control*, EPA/505/2-90-001, March 1991.

Figure F-2
WET Accelerated Monitoring Flow Chart



b. **Constituent Study.** There are indications that the discharge may contain a constituent that have a reasonable potential to cause or contribute to an exceedance of water quality objectives for indeno (1,2,3-cd)pyrene. This Order requires the Discharger to complete a study of indeno (1,2,3-cd)pyrene's potential effect in the receiving water. 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 constituent.

3. Best Management Practices and Pollution Prevention

c. **Salinity Evaluation and Minimization Plan.** An Evaluation and Minimization Plan for salinity is required to be maintained in this Order to ensure adequate measures are developed and implemented by the Discharger to reduce the discharge of salinity to the Sacramento River.

4. Construction, Operation, and Maintenance Specifications

a. The operation and maintenance specifications for the Facility ponds are necessary to protect the beneficial uses of the groundwater. The specifications included in this Order are retained from R5-2010-0096. In addition, reporting requirements related to use of the flow equalization basins, emergency storage ponds, and the facultative sludge lagoons are required to monitor their use and the potential impact on groundwater.

5. Special Provisions for Municipal Facilities (POTW's Only)

a. **Pretreatment Requirements.**

i. The federal CWA section 307(b), and federal regulations, 40 C.F.R. part 403, require publicly owned treatment works to develop an acceptable industrial pretreatment program. A pretreatment program is required to prevent the introduction of pollutants, which will interfere with treatment plant operations or sludge disposal, and prevent pass through of pollutants that exceed water quality objectives, standards or permit limitations. Pretreatment requirements are imposed pursuant to 40 C.F.R. part 403.

ii. The Discharger shall implement and enforce its approved pretreatment program and is an enforceable condition of this Order. If the Discharger fails to perform the pretreatment functions, the Central Valley Water Board, the State Water Board or USEPA may take enforcement actions against the Discharger as authorized by the CWA.

b. **Collection System.** The State Water Board issued General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order 2006-0003-DWQ (General Order) on 2 May, 2006. The Monitoring and Reporting Requirements for the General Order were amended by Water Quality Order WQ 2008-0002-EXEC on 20 February 2008. 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.

c. **Anaerobically Digestible Material.** Managers of POTW's increasingly are considering the addition of organic material such as food waste, fats, oils and grease (FOG) into their anaerobic digesters for co-digestion. Benefits of accepting these materials include increasing the volume of methane and other biogases available for energy production and ensuring such materials are disposed of at the POTW instead of discharged into the collection system potentially causing sanitary sewer overflows. The State Water Board has been working with the California Department of Resources Recycling and Recovery (CalRecycle), the California Department of Food and Agriculture (CDFA), and the California Association of Sanitation Agencies (CASA) to delineate jurisdictional authority for the receipt of hauled-in anaerobically digestible material (ADM[1]) at POTW's for co-digestion.

CalRecycle is proposing an exclusion from Process Facility/Transfer Station permits for direct injection of ADM to POTW anaerobic digesters for co-digestion that are regulated under waste discharge requirements or NPDES permits. The proposed CalRecycle exclusion is restricted to ADM that has been prescreened, slurried, and processed/conveyed in a closed system to be co-digested with regular POTW sludge. The CalRecycle exclusion assumes that a POTW has developed Standard Operating Procedures (SOP's) for the proper handling, processing, tracking, and management of the ADM received.

The Discharger currently does not accept hauled-in ADM for direct injection into its anaerobic digester for co-digestion. However, if the Discharger proposes to receive hauled-in ADM for injection into its anaerobic digester for co-digestion, this provision requires the Discharger to notify the Central Valley Water Board and develop and implement SOP's for this activity prior to initiation of the hauling. The requirements of the SOP's are discussed in Section VI.C.5.d.

6. Compliance Schedules – Not Applicable

VII. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

CWA section 308 and 40 C.F.R. sections 122.41(h), (j)-(l), 122.44(i), and 122.48 require that all NPDES permits specify monitoring and reporting requirements. Water Code sections 13267 and 13383 also authorize the Central Valley Water Board to establish monitoring, inspection, entry, reporting, and recordkeeping requirements. The Monitoring and Reporting Program (MRP), Attachment E of this Order establishes monitoring, reporting, and recordkeeping requirements that implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the MRP for this facility.

[1] CalRecycle has proposed to define "anaerobically digestible material" to include inedible kitchen grease as defined in Food and Agricultural Code section 19216, food material as defined in California Code of Regulations, title 14, section 17852 and vegetative food material.

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., BOD_5 and TSS reduction requirements). The monitoring frequencies for BOD_5, TSS (weekly) and pH (continuous), flow to headworks (continuous) have been retained from Order No. R5-2010-0096. Annual priority pollutant monitoring has not been retained as influent monitoring for priority pollutants is conducted annually through the Discharger's pretreatment program requirements. Metals monitoring has been retained, however the monitoring frequency has increased from annual to quarterly.
2. Influent flow monitoring of diversions to the flow equalization basins has been added to this Order. This monitoring is necessary in order to adequately quantify total raw sewage flows to the Facility from the collection system.

B. Effluent Monitoring

1. Pursuant to the requirements of 40 C.F.R. section 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 flow, BOD_5, TSS, copper, chlorodibromomethane, dichlorobromomethane, zinc, ammonia, total chlorine residual, and total coliform organisms have been retained from Order R5-2010-0096 to determine compliance with effluent limitations for these parameters.
3. Monitoring data collected over the previous permit term for aluminum did not demonstrate reasonable potential to exceed water quality objectives/criteria. Thus, specific monitoring requirements for this parameter have not been retained from Order No. R5-2010-0096.
4. This Order includes effluent limitations for diazinon and chlorpyrifos based on the applicable TMDL for the Sacramento and Feather Rivers. Therefore, this Order establishes annual monitoring for diazinon and chlorpyrifos to characterize the effluent and determine compliance with the applicable effluent limitations based on the TMDL
5. 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 DDW 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 CWA. (Wat. Code §§ 13370, subd. (c), 13372, 13377.) Section 13176 is inapplicable to NPDES permits to the extent it is inconsistent with CWA 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.** Semi-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. Monitoring frequencies for dissolved zinc and dissolved copper have increased from annual to monthly to assess assimilative capacity in the receiving water for these parameters and to characterize the dissolved fraction of these metals in the receiving water.

2. Groundwater

a. Water Code section 13267 states, in part, "(a) A *Regional Water Board, in establishing…waste discharge requirements… may investigate the quality of any waters of the state within its region" and "(b) (1) In conducting an investigation…, the Regional Water Board may require that any person who… discharges… waste…that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Water Board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports.*" The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, a Regional Water Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports. The Monitoring and Reporting Program is issued pursuant to Water Code section 13267. The groundwater monitoring and reporting program required by this Order and the Monitoring and Reporting Program are necessary to assure compliance with these waste discharge requirements. The Discharger is responsible for the discharges of waste at the facility subject to this Order.

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

c. This Order requires the Discharger to conduct groundwater monitoring and includes a regular schedule of groundwater monitoring in the attached Monitoring and Reporting Program. The groundwater monitoring reports are necessary to evaluate impacts to waters of the State to assure protection of beneficial uses and compliance with Central Valley Water Board plans and policies, including Resolution No. 68-16. Evidence in the record includes effluent monitoring data that indicates the presence of constituents that may degrade groundwater and surface water.

E. Other Monitoring Requirements

1. Biosolids Monitoring

Biosolids monitoring is required to ensure compliance with the biosolids disposal requirements contained in the Special Provision contained in section VI.C.5.b. of this Order. Biosolids disposal requirements are imposed pursuant to 40 C.F.R. part 503 to protect public health and prevent groundwater degradation.

2. Water Supply Monitoring

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

3. Pond Monitoring

Pond monitoring is required to ensure proper operation and maintenance of the Facility ponds. Weekly monitoring for dissolved oxygen, freeboard, and levee condition and odor observations has been retained from Order No. R5-2010-0096. Pond freeboard monitoring is also necessary to determine the frequency of wastewater storage in the emergency storage ponds.

4. Land Discharge Monitoring – Not Applicable

5. Discharge Monitoring Report-Quality Assurance (DMR-QA) Study Program

Under the authority of section 308 of the CWA (33 U.S.C. § 1318), U.S. EPA requires major permittees under the NPDES Program to participate in the annual DMR-QA Study Program. The DMR-QA Study evaluates the analytical ability of laboratories that routinely perform or support self-monitoring analyses required by NPDES permits. There are two options to satisfy the requirements of the DMR-QA Study Program: (1) The Discharger can obtain and analyze a DMR-QA sample as part of the DMR-QA Study; or (2) Per the waiver issued by U.S.EPA to the State Water Board, the Discharger can submit the results of the most recent Water Pollution Performance Evaluation Study from their own laboratories or their contract laboratories. A Water Pollution Performance Evaluation Study is similar to the DMR-QA Study. Thus, it also evaluates a laboratory's ability to analyze wastewater samples to produce quality data that ensure the integrity of the NPDES Program. The Discharger shall submit annually the results of the DMR-QA Study or the results of the most recent Water Pollution Performance Evaluation Study to the State Water Board. The State Water Board's Quality Assurance Program Officer will send the DMR-QA Study results or the results of the most recent Water Pollution Performance Evaluation Study to U.S. EPA's DMR-QA Coordinator and Quality Assurance Manager.

VIII. PUBLIC PARTICIPATION

The Central Valley Water Board has considered the issuance of WDR's that will serve as an NPDES permit for Clear Creek Wastewater Treatment Plant. As a step in the WDR adoption

process, the Central Valley Water Board staff has developed tentative WDR's and has encouraged public participation in the WDR adoption process.

A. Notification of Interested Parties

The Central Valley Water Board notified the Discharger and interested agencies and persons of its intent to prescribe WDR's for the discharge and provided an opportunity to submit written comments and recommendations. Notification was provided through the following: Posting of the Notice of Public Hearing at Redding City Hall, at the public entrance to the Facility, the City of Redding's U.S. Post Office (if allowed), and the local newspaper (The Record Searchlight).

The public had access to the agenda and any changes in dates and locations through the Central Valley Water Board's website at:
http://www.waterboards.ca.gov/centralvalley/board_info/meetings/

B. Written Comments

Interested persons were invited to submit written comments concerning tentative WDR's as provided through the notification process. Comments were due either in person or by mail to the Executive Office at the Central Valley Water Board at the address on the cover page of this Order.

To be fully responded to by staff and considered by the Central Valley Water Board, the written comments were due at the Central Valley Water Board office by 5:00 p.m. on **20 January 2017**.

C. Public Hearing

The Central Valley Water Board held a public hearing on the tentative WDR's during its regular Board meeting on the following date and time and at the following location:

Date:	23 and 24 February 2017
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 were invited to attend. At the public hearing, the Central Valley Water Board heard testimony pertinent to the discharge, WDR's, and permit. For accuracy of the record, important testimony was requested in writing.

D. Reconsideration of Waste Discharge Requirements

Any aggrieved person may petition the State Water Board to review the decision of the Central Valley Water Board regarding the final WDR's. The petition must be received by the State Water Board at the following address within 30 calendar days of the Central Valley Water Board's action:

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

For instructions on how to file a petition for review, see
http://www.waterboards.ca.gov/public_notices/petitions/water_quality/wqpetition_instr.shtml

E. Information and Copying

The Report of Waste Discharge, other supporting documents, and comments received are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through the Central Valley Water Board by calling (530) 224-4845.

F. Register of Interested Persons

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

G. Additional Information

Requests for additional information or questions regarding this order should be directed to Stacy Gotham at (530) 224-4993.

ATTACHMENT G – SUMMARY OF REASONABLE POTENTIAL ANALYSIS

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
Aluminum, Total	µg/L	173 38[1]	498 102[1]	750 200	750[5]	--	--	--	--	200[2]	No
Aluminum, Diss.	µg/L	NA	118 75[1]	750 200	750[5]	--	--	--	--	200[2]	No
Ammonia, Total (as N)	mg/L	12.5	<0.1	2.14	2.14[5,7]	2.80[5,8] 6.99[5,9]	--	--	--	--	Yes
Cadmium, Total Recov.	µg/L	0.044	0.08	0.29	2.1	1.4	--	--	0.290	5[3]	No
Cadmium, Diss.	µg/L	NA	0.05	0.29	2.0	1.3	--	--	0.298	5[3]	--
Chloride	mg/L	52.8 49[1]	3.54 2.6[1]	230	860[5]	230[5]	--	--	--	250[2]	No
Chlorodibromomethane	µg/L	1.67	<0.06	0.41	--	--	0.41	34	--	80[3,4]	Yes
Copper, Total Recov.	µg/L	17.5	6.9	5.2	7.3	5.2	1300	--	7.2	1300[3]	Yes
Copper, Diss.	µg/L	NA	3.6	5.0	7.0	5.0	--	--	6.9	1300[3]	--
Dichlorobromomethane	µg/L	13.4	<0.06	0.56	--	--	0.56	46	--	80[3,4]	Yes
Electrical Conductivity	µmhos /cm	568 417[1]	164 141[1]	230	--	--	--	--	230	900[2]	No
Indeno (1,2,3-cd) Pyrene	µg/L	0.06	<0.04	0.0044	--	--	0.0044	0.049	--	--	See Fact Sheet section IV.C.3
Iron, Total	µg/L	79[1]	254[1]	300	--	1000[5]	--	--	--	300[2]	No
Lead, Total	µg/L	0.18	0.051		34	1.3	--	--	--	15[3]	No
Manganese	µg/L	17.6	20.4	50				100[5]		50[2]	No
Nitrate (as N)	mg/L	14.6	1.4	10[6]	--	--	10[5]	--	--	10[3,6]	Yes
Nitrite (as N)	mg/L	0.01	<0.1	10[6]	--	--	--	--	--	10[3,6]	See Nitrate
Sulfate	mg/L	30.4 26[1]	6.9 3.7[1]	250	--	--	--	--	--	250[2]	No
Total Dissolved Solids	mg/L	300 254[1]	220 115[1]	500	--	--	--	--	--	500[2]	No
Total Trihalomethanes	µg/L	47	NA	ND	--	--	--	--	--	80[3,4]	No
Zinc, Total Recov.	µg/L	92.8	10	19.7	67	67	--	--	19.7	5000[2]	Yes
Zinc, Diss.	µg/L	NA	4.4	19.25	65	66	--	--	19.25	5000[2]	--

Constituent	Units	MEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential

General Note: All inorganic concentrations are given as a total recoverable, unless otherwise noted.
Date Range: May 2013 through May 2016, unless otherwise noted.
Design Ambient Hardness for Hardness-Dependent Criteria: 50 mg/L as $CaCO_3$
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) Maximum calendar annual average.
(2) Secondary MCL.
(3) Primary MCL.
(4) For total trihalomethanes (TTHM): sum of bromoform, CDBM, DCBM, and chloroform.
(5) National Recommended WQ Criteria.
(6) As nitrogen (N), limit for nitrate+nitrite.
(7) Basin maximum pH of 8.5.
(8) 30-day ammonia criteria.
(9) 4-day ammonia criteria.

ATTACHMENT H – CALCULATION OF WQBEL'S

Human Health WQBEL's Calculations									
Parameter	**Units**	**Criteria**	**Mean Background Concentration**	**Dilution Factor**	**MDEL/AMEL Multiplier**	**AMEL Multiplier**	**AMEL**	**MDEL**	**AWEL**
Chlorodibromomethane	µg/L	0.41	<0.06	9	2.0	1.56	3.56	7.20	n/a
Dichlorobromomethane	µg/L	0.56	<0.06	30	1.88	1.47	15.56	29.22	n/a
Nitrate Nitrogen, Total (as N)	mg/L	10	1.4 [1]	1	1.51	1.76	19.9	n/a	27.7

[1] Maximum background concentration.

Aquatic Life WQBEL's Calculations																
Parameter	**Units**	**Criteria**		**Dilution Factors**		**Aquatic Life Calculations**							**Final Effluent Limitations**			
		CMC	**CCC**	**CMC**	**CCC**	**ECA Multiplier$_{acute}$**	**LTA$_{acute}$**	**ECA Multiplier$_{chronic}$**	**LTA$_{chronic}$**	**AMEL Multiplier$_{95}$**	**AWEL Multiplier**	**MDEL Multiplier$_{99}$**	**AMEL[1]**	**AWEL[2]**	**MDEL[3]**
Ammonia Nitrogen, Total (as N)	mg/L	5.62	2.80	--	--	0.32	1.8	0.78	2.18	1.55	2.68	3.11	2.80	4.83	n/a
Copper, Total Recoverable	µg/L	6.8[4]	5.0[4]	8	12	0.48	16.7	0.68	15.4	1.3	n/a	2.1	20.2	n/a	32.0
Zinc, Total Recoverable	µg/L	19.7	66.9	10	1	0.55	64	0.73	90.4	1.25	n/a	1.82	79.7	n/a	116.7
Chlorpyrifos	µg/L	0.025	0.015	--	--	0.321	0.008	0.527	.0079	1.55	2.68	3.11	0.012	0.021	n/a
Diazinon	µg/L	0.16	0.10	--	--	0.321	0.051	0.527	0.053	1.55	2.68	3.11	0.079	0.14	n/a

[1] Average Monthly Effluent Limitations are calculated according to Section 1.4 of the SIP using a 95th percentile occurrence probability.
[2] Average Weekly Effluent Limitations are calculated according to Section 1.4 of the SIP using a 98th percentile occurrence probability.
[3] Maximum Daily Effluent Limitations are calculated according to Section 1.4 of the SIP using a 99th percentile occurrence probability.
[4] Dissolved concentration.