i. 2.2 most probable number (MPN) per 100 mL, as a 7-day median;
ii. 23 MPN/100 mL, more than once in any 30-day period; and
iii. 240 MPN/10 mL, at any time.

~~j.~~k. **Average Dry Weather Flow.** The average dry weather discharge flow shall not exceed 55 mgd.

~~k.~~l. **Chlorpyrifos and Diazinon.** Effluent chlorpyrifos and diazinon concentrations shall not exceed the sum of one as defined below:

v. Average Monthly Effluent Limit

$$S_{AMEL} = \frac{C_{D\text{-}avg}}{0.08} + \frac{C_{C\text{-}avg}}{0.012} \leq 1.0$$

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

vi. Maximum Daily Effluent Limit

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

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

2. Interim Effluent Limitations

The Discharger shall maintain compliance with the following limitations at Discharge Point No. 001, with compliance measured at Monitoring Location EFF-001 as described in the attached MRP. These interim effluent limitations shall apply in lieu of the corresponding final effluent limitations specified for the same parameters during the time period indicated in this provision.

a. **Mercury, total. Effective immediately, and until 31 December 2030,** the effluent calendar annual total mercury load shall not exceed ~~57~~ 217 grams. These interim effluent limitations shall apply in lieu of the final effluent limits for methylmercury (Section IV.A.1.~~e~~f).

b. **Nitrate plus Nitrite, as N. Effective immediately and ending on** ~~30 December 2023~~1 June 2024, the Discharger shall maintain compliance with the interim effluent limitation specified in Table 5. This interim effluent limitation shall apply in lieu of the corresponding final effluent limitations specified in Section IV.A.1.a.

Table 5. Interim Effluent Limitation

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Nitrate + Nitrite (as N)	mg/L	-	-	31	-	-

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 San Joaquin 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 dissolved oxygen concentration to be reduced below 6.0 mg/L any time from 1 September through 30 November.
    b. The dissolved oxygen concentration to be reduced below 5.0 mg/L at any time from 1 December through 31 August.

6. **Floating Material.** Floating material to be present in amounts that cause nuisance or adversely affect beneficial uses.

7. **Oil and Grease.** Oils, greases, waxes, or other materials to be present in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.

8. **pH.** The pH to be depressed below 6.5 nor raised above 8.5.

9. **Pesticides:**

    a. Pesticides to be present, individually or in combination, in concentrations that adversely affect beneficial uses;
    b. Pesticides to be present in bottom sediments or aquatic life in concentrations that adversely affect beneficial uses;
    c. Total identifiable persistent chlorinated hydrocarbon pesticides to be present in the water column at concentrations detectable within the accuracy of analytical methods approved by USEPA or the Executive Officer;
    d. Pesticide concentrations to exceed those allowable by applicable antidegradation policies (see State Water Board Resolution No. 68-16 and 40 CFR 131.12.);
    e. Pesticide concentrations to exceed the lowest levels technically and economically achievable;
    f. Pesticides to be present in concentration in excess of the maximum contaminant levels set forth in CCR, Title 22, division 4, chapter 15; and

g. Thiobencarb to be present in excess of 1.0 µg/L.

10. Radioactivity:

a. Radionuclides to be present in concentrations that are harmful to human, plant, animal, or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.
b. Radionuclides to be present in excess of the maximum contaminant levels (MCLs) specified in Table 64442 of section 64442 and Table 64443 of section 64443 of Title 22 of the California Code of Regulations.

11. 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.

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

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

14. 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.

15. Temperature. The Thermal Plan is applicable to this discharge. The Thermal Plan requires that the discharge shall not cause the following in the San Joaquin River:

a. The creation of a zone, defined by water temperatures of more than 1°F above natural receiving water temperature, which exceeds 25 percent of the cross-sectional area of the river channel at any point; and
b. A surface water temperature rise greater than 4°F above the natural temperature of the receiving water at any time or place.

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

17. Turbidity.

a. Shall not exceed 2 Nephelometric Turbidity Units (NTU) where natural turbidity is less than 1 NTU;
b. Shall not increase more than 1 NTU where natural turbidity is between 1 and 5 NTUs;
c. Shall not increase more than 20 percent where natural turbidity is between 5 and 50 NTUs;
d. Shall not increase more than 10 NTU where natural turbidity is between 50 and 100 NTUs; nor
e. Shall not increase more than 10 percent where natural turbidity is greater than 100 NTUs.

B. Groundwater Limitations

Release of waste constituents from any portion of the Facility shall not cause groundwater to:

1. Contain any of the following constituents in concentrations greater than listed or greater than natural background quality, whichever is greater.

Table 6. Groundwater Limitations

Constituent	Units	Limitation
Total Coliform Organisms	MPN/100 mL	<2.2
Electrical Conductivity @ 25°C[1]	µmhos/cm	2000[2]
Total Dissolved Solids[1]	mg/L	450[3]
Nitrate Nitrogen, Total (as N)	mg/L	10

[1] ~~1~~ A cumulative impact limit that accounts for several dissolved constituents in addition to those listed here separately [e.g., alkalinity (carbonate and bicarbonate), calcium, hardness, phosphate, and potassium].

[2] Natural background quality is known to have exceeded this TDS limitation at all 21 monitoring points.

[3] ~~3~~ Natural background quality is known to have exceeded this EC limitation at 11 of 21 compliance monitoring points.

2. Exhibit a pH of less than 6.5 or greater than 8.4 pH units.

3. ~~Impart taste, odor, chemical constituents, toxicity, or color that creates nuisance or impairs any beneficial use.~~ 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:

- *New regulations.* New regulations have been promulgated under section 405(d) of the CWA, or the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued.

- *Land application plans.* When required by a permit condition to incorporate a land application plan for beneficial reuse of sewage sludge, to revise an existing land application plan, or to add a land application plan.

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

The Central Valley Water Board may review and revise this Order at any time upon application of any affected person or the Central Valley Water Board's own motion in accordance with the provisions of 40 CFR sections 122.62.

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, and adequate public notification to downstream water agencies or others who might contact the non-complying discharge.

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 the Discharger does not comply or will be unable to comply for any reason, with any prohibition, maximum daily effluent limitation, 1-hour average effluent limitation, or receiving water limitation contained in this Order, the Discharger shall notify the Central Valley Water Board by telephone (916) 464-3291 within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within 5 days, unless the Central Valley Water Board waives confirmation. The written notification shall include the information required by the Standard Provision contained in Attachment D section V.E.1. [40 CFR 122.41(l)(6)(i)].

p. Failure to comply with provisions or requirements of this Order, or violation of other applicable laws or regulations governing discharges from this facility, may subject the Discharger to administrative or civil liabilities, criminal penalties, and/or other enforcement remedies to ensure compliance. Additionally, certain violations may subject the Discharger to civil or criminal enforcement from appropriate local, state, or federal law enforcement entities.

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

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

B. Monitoring and Reporting Program (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 122.62, including, but not limited to:

iv. 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.

v. 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.** The Basin Plan's Delta Mercury Control Program was designed to proceed in two phases. After Phase 1, the Central Valley Water Board will conduct a Phase 1 Delta Mercury Control Program Review that considers: modification to the Delta Mercury Control Program. This Order may be reopened to address changes to the Delta Mercury Control Program.

d. **Pollution Prevention.** This Order requires the Discharger implement pollution prevention plans following Water Code section 13263.3(d)(3) for mercury, nitrate plus nitrite and salinity. Based on a review of the pollution prevention plans, this Order may be reopened for addition and/or modification of effluent limitations and requirements for this constituent.

e. **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.

f. **Water Effects Ratios (WER) and Metal Translators.** A default WER of 1.0 has been used in this Order for calculating CTR criteria for applicable priority pollutant inorganic constituents. 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.

g. **Regional Monitoring Program.** The Central Valley Water Board is developing a Regional Monitoring Program for the Sacramento-San Joaquin Delta. This Order may be reopened to modify the monitoring requirements to implement the Regional Monitoring Program.

h. **CV-SALTS.** 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. This Order may be reopened to implement the CV-SALTS initiative.

i. **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.

j. **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.

k. **Bay-Delta Plan South Delta Salinity Objectives Update.** The State Water Board is currently in the process of updating the South Delta Salinity Objectives contained in the Bay-Delta Plan. The updated salinity objectives may result in needed changes to the salinity requirements in this Order. Therefore, this Order may be reopened to modify salinity requirements, as appropriate, in accordance with changes to the Bay-Delta Plan.

~~k.~~ l. **2013 Ammonia Criteria.** Ammonia criteria for waters where mussels are present were used because freshwater mussels have been surveyed near the discharge. However, if the Discharger can submit sufficient information indicating mussels are not present in the receiving water through a "mussel study to evaluate presence/absence of mussels", and it is determined that it is not necessary to protect mussels in the receiving water this Order may be reopened to allow for the recalculation procedures to determine the appropriate ammonia criteria.

2. Special Studies, Technical Reports and Additional Monitoring Requirements

a. **Toxicity Reduction Requirements**

Chronic Whole Effluent Toxicity. For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct chronic whole effluent toxicity (WET) testing, as specified in 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 procedures for accelerated chronic toxicity monitoring and TRE initiation.

i. **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.

ii. **Numeric Toxicity Monitoring Trigger.** The numeric toxicity monitoring trigger to initiate a TRE is **> 1 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.

iii. **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. **Phase I Methylmercury Control Study.** In accordance with the Basin Plan's Delta Mercury Control Program and the compliance schedule included in this Order for methylmercury (Section VI.C.7.a), the Discharger shall participate in the Central Valley Clean Water Association (CVCWA) Coordinated Methylmercury Control Study (Study) to evaluate existing control methods and, as needed, develop additional control methods that could be implemented to achieve the methylmercury waste load allocation. A work plan was submitted by CVCWA on **20 April 2013**. The study work plan will be reviewed by a Technical Advisory Committee (TAC) and approved by the Executive Officer. The work plan shall be implemented immediately after approval by the Executive Officer, and a progress report shall be submitted by **20 October 2015**.

The Study shall evaluate the feasibility of reducing sources more than the minimum amount needed to achieve the methylmercury allocation. The Study also may include an evaluation of innovative actions, watershed approaches, offsets projects, and other short and long-term actions that result in reducing inorganic (total) mercury and methylmercury to address the accumulation of methylmercury in fish tissue and to reduce methylmercury exposure. The Study may evaluate the effectiveness of using inorganic (total) mercury controls to control methylmercury discharges.

The Study shall include a description of methylmercury and/or inorganic (total) mercury management practices identified in Phase 1; an evaluation of the effectiveness, costs, potential environmental effects, and overall feasibility of the control actions. The Study shall also include proposed implementation plans and schedules to comply with methylmercury allocations as soon as possible. The Study shall be submitted to the Central Valley Water Board by **20 October 2018**.

The Executive Officer may, after public notice, extend the due date up to two years if the Discharger demonstrates it is making significant progress towards developing, implementing and/or completing the Study and reasonable attempts have been made to secure funding for the Study, but the Discharger has experienced severe budget shortfalls.

3. **Best Management Practices and Pollution Prevention**

   a. **Pollution Prevention Plan for Mercury.** The Discharger shall update and implement a pollution prevention plan (PPP) for mercury in accordance with Water Code section 13263.3(d)(3), per the compliance schedule in this Order for methylmercury (Section VI.C.7.a). The minimum requirements for the pollution prevention plan are outlined in the Fact Sheet (Attachment F section VI.B.3.i). Progress reports shall be submitted annually in accordance with the Monitoring and Reporting Program (Attachment E section X.D.1.). The progress reports shall discuss the effectiveness of the PPP in the reduction of mercury in the discharge, include a summary of mercury and methylmercury monitoring results, and discuss updates to the PPP.

   b. **Pollution Prevention Plan for Salinity.** The Discharger submitted a PPP for salinity that meets the requirements of Water Code section 13263.3(d)(3). The Discharger shall continue to implement the PPP for salinity.

   c. **Mercury Exposure Reduction Program.** The Discharger shall participate in a mercury Exposure Reduction Program (MERP) in accordance with the Basin Plan's Delta Mercury Control Program. By letter dated 28 August 2013, the Discharger elected to provide financial support in the collective MERP with other Delta dischargers, rather than be individually responsible for any MERP activities. An exposure reduction work plan for Executive Officer approval was submitted on **20 October 2013**. The objective of the Exposure Reduction Program is to reduce mercury exposure of Delta fish consumers most likely affected by mercury. The work plan shall address the Exposure Reduction Program objective, elements, and the Discharger's coordination with other stakeholders. The minimum requirements for the exposure reduction work plan are outlined in the Fact Sheet (Attachment F section VI.B.3.ii). The Discharger shall integrate or, at minimum, provide good-faith opportunities for integration of community-based organizations, tribes, and consumers of Delta fish into planning, decision making, and implementation of

exposure reduction activities. The Discharger shall continue to participate in the group effort to implement the work plan.

4. **Construction, Operation and Maintenance Specifications**

   a. **Title 22, or Equivalent, Disinfection Requirements**. Wastewater discharged to the San Joaquin River shall be oxidized, coagulated, filtered, and adequately disinfected pursuant to the Department of Public Health (DPH) reclamation criteria, CCR, Title 22, division 4, chapter 3, (Title 22), or equivalent.

   b. **Turbidity.** Effluent turbidity shall not exceed any of the following:

      i. 2 NTU, as a daily average;

      ii. 5 NTU, more than 5% of the time within a 24-hour period;

      iii. 10 NTU, at any time.

   c. **Treatment Pond Operating Requirements.**

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

      ii. Public contact with wastewater in the treatment ponds shall be precluded through such means as fences, signs, and other acceptable alternatives.

      iii. Treatment 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 shall never be less than 2 feet (measured vertically to the lowest point of overflow) as a monthly average and never less than 1 foot at any time.

      v. The discharge of waste classified as "hazardous" as defined in section 2521(a) of Title 23, California Code of Regulations (CCR), to the treatment ponds is prohibited.

      vi. Objectionable odors originating from the treatment ponds shall not be perceivable beyond the limits of the wastewater treatment and disposal areas (or property owned by the Discharger).

      vii. As a means of discerning compliance with Treatment Pond Operating Requirements (IV.C.4.c.vi) the dissolved oxygen content in the upper zone (1 foot) of wastewater in treatment ponds shall not be less than 1.0 mg/L.

      viii. Treatment ponds shall not have a pH less than 6.5 or greater than 9.0.

5. Special Provisions for Municipal Facilities (POTWs Only)

a. **Pretreatment Requirements**

i. The Discharger shall be responsible and liable for the performance of all Control Authority pretreatment requirements contained in 40 CFR Part 403, including any subsequent regulatory revisions to 40 CFR Part 403. Where 40 CFR 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~~1 year 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 CFR Part 403 including, but not limited to:

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

(b) Enforce the pretreatment requirements under 40 CFR 403.5 and 403.6;

(c) Implement the programmatic functions as provided in 40 CFR 403.8(f)(2); and

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

iv. **Pretreatment Reporting Requirements.** Pretreatment reporting requirements are included in the Monitoring and Reporting Program, section X.D.5 of Attachment E.

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 sewage that has been treated and tested and shown to be capable of being beneficially and legally used pursuant to federal and state regulations as a soil amendment for agricultural, silvicultural, horticultural, and land reclamation activities as specified under 40 CFR Part 503.

i. Collected screenings, residual sludge, biosolids, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste, as set forth in Title 27, CCR, division 2, subdivision 1, section 20005, et seq. Removal for further treatment, 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 Central Valley 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 CFR Part 503. If the State Water Board and the Central Valley Water Board are given the authority to implement regulations contained in 40 CFR Part 503, this Order may be reopened to incorporate appropriate time schedules and technical standards. The Discharger must comply with the standards and time schedules contained in 40 CFR Part 503 whether or not they have been incorporated into this Order.

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 update a 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.

vi. The Discharger is encouraged to comply with the "Manual of Good Practice for Agricultural Land Application of Biosolids" developed by the California Water Environment Association.

vii. Use of biosolids as a soil amendment shall comply with valid waste discharge requirements (WDRs) issued by the State or Regional Water Boards. In most cases, this means the WDRs contained in the State Water Resources Control Board Water Quality Order No. 2004-0012-DWQ, General Waste Discharge Requirements for the Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvicultural, Horticultural, and Land Reclamation Activities (Biosolids General Order). For a biosolids use project to be covered by the Biosolids General Order, the Discharger must file a complete Notice of Intent and receive a Notice of Applicability for each project.

c. **Collection System.** On 2 May 2006, the State Water Board adopted State Water Board Order No. 2006-0003-DWQ, Statewide General WDRs 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 WDRs. The Discharger has applied for and has been approved for coverage under Order 2006-0003-DWQ for operation of its wastewater collection system.

6. Other Special Provisions

Not Applicable

7. Compliance Schedules

a. **Compliance Schedule for Final Effluent Limitations for Methylmercury.** This Order requires compliance with the final effluent limitations for methylmercury by **31 December 2030**. The Discharger shall comply with the following time schedule to ensure compliance with the final effluent limitations:

Task		Date Due
Phase 1		
i.	Submit CVCWA Coordinated Methylmercury Control Study Work Plan	**Complete**
ii.	Implement Pollution Prevention Plan (PPP)[1] for Mercury (per Section VI.C.3.a)	**Complete**
iii.	Implement CVCWA Coordinated Methylmercury Control Study Work Plan	**Immediately following Executive Officer Approval**
iv.	Annual Progress Reports[2]	**30 January, annually**
v.	Submit CVCWA Coordinated Methylmercury Control Study Progress Report	**20 October 2015**
vi.	Submit Final CVCWA Coordinated Methylmercury Control Study	**20 October 2018**[3]
Phase 2		
vii.	Implement methylmercury control programs	**TBD**[4]
viii.	Full Compliance	**31 December 2030**[3]

Task — Date Due

1 The PPP for Mercury shall be updated and implemented in accordance with Section VI.C.3.a. The Discharger shall continue to implement its existing PPP for mercury during the period in which it updates the PPP.

2 Beginning 30 January 2015 and annually thereafter until the Facility achieves compliance with the final effluent limitations for methyl mercury, the Discharger shall submit annual progress reports on pollution minimization activities implemented and evaluation of their effectiveness, including a summary of total mercury and methylmercury monitoring results.

3 The Executive Officer may, after public notice, extend the due date for the Final CVCWA Coordinated Methylmercury Control Study up to two years if the Discharger demonstrates it is making significant progress towards developing, implementing and/or completing the Study and reasonable attempts have been made to secure funding for the Study, but the Discharger has experienced severe budget shortfalls.

4 To be determined. Following Phase 1 the Central Valley Water Board will conduct a Phase 1 Delta Mercury Control Program Review that considers: modification of methylmercury goals, objectives, allocations, final compliance date, etc. Consequently, the start of Phase 2 and the final compliance date is uncertain at the time this Order was adopted.

b. **Time Schedule for Compliance with Groundwater Limitations and Best Practicable Treatment or Control (BPTC).** State Water Board Resolution 68-16 (Antidegradation Policy) requires 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 Discharger currently stores digested sludge in an unlined lagoon ~~and secondary treated effluent is contained in unlined ponds~~. A recently completed *Background Groundwater Quality Characterization Technical Report for the City of Stockton Regional Wastewater Control Facility* (March 2013) indicated possible groundwater degradation from the Facility (see Attachment C for groundwater monitoring well network contour map). Data evaluation identified three localized possible impacts to groundwater quality: 1) known leak at the foul air duct near monitoring well MW-13 that was repaired in 2004. Groundwater at this well ~~and~~ has substantially self-remediated with respect to nitrate and shows statistically significant decreasing trends with respect to TDS, ED, and chloride; however, groundwater salinity remains high relative to most other wells; 2) MW-12 adjacent to the sludge lagoon ~~has~~ had elevated nitrate and has increasing salinity trends; and 3) MW-10, under which groundwater does not move, has elevated nitrate.

The Discharger must submit a BPTC Technical Evaluation Work Plan and Time Schedule that sets forth a comprehensive technical evaluation and time schedule to implement or modify the Facility as necessary to comply with the Antidegradation Policy.

The Discharger shall comply with the following schedule:

Task	Compliance Date
1 – Submit Background Groundwater Quality Characterization Technical Report	Completed (22 March 2013)
2 – Submit Work Plan and Time Schedule for BPTC Technical Evaluation	31 December 2014
3 – Submit BPTC Technical Evaluation Study	As established by Task 2 and following approval of the work plan and time schedule

Task	Compliance Date
4 – Implement necessary modifications to achieve BPTC	As established by Task 3 and following approval of technical evaluation and time schedule.
5 – Progress Reports	1 June, annually, beginning 1 June 2016
6 – Submit report documenting completion of implementation of BPTC Recommendations and compliance with Groundwater Limitations V.B	No later than 5 years following Task 3

c. **Compliance Schedule for Nitrate plus Nitrite.** This Order requires compliance with the final effluent limitations for nitrate plus nitrite in Section IV.A.1.a of this Order by ~~31 December 2023~~1 June 2024. The Discharger shall comply with the following time schedule to ensure compliance with these requirements:

	Task	Date Due
i.	**Submit Method of Compliance Workplan.** Submit workplan that ensures compliance with final effluent limitations for nitrate plus nitrite by the final compliance date.	**31 December 2014**
ii.	**Submit and Implement Pollution Prevention Plan (PPP) for Nitrate Plus Nitrite in accordance with Water Code section 13263.3(d)(3).** The PPP shall be prepared and implemented in accordance with Attachment F, Section VI.B.3.	**31 December 2014**
iii.	**Progress Reports.** The progress reports shall detail what steps have been implemented towards achieving compliance with waste discharge requirements, including studies, construction progress, evaluation of measures implemented, and recommendations for additional measures as necessary to achieve full compliance by the final compliance date.	**30 June**, annually, beginning June 2015 until final compliance.
~~iv.~~	~~**Rate Analysis Report.** Submit a report with the annual progress report that includes the following:~~ ~~1) Identification of the funding alternatives and sources, such as revenue bonds, State Revolving Fund loan, etc., and~~ ~~2)~~1)~~An evaluation of the source of rate revenue necessary to fund the selected compliance project(s).~~	~~30 June 2015~~
~~v.~~	~~**Complete Financing Plan.** Submit with the annual progress report a financing plan for the selected compliance project(s) and a schedule for obtaining funding.~~	~~30 June 2016~~
~~vi~~iv.	**Complete Treatment Technology Evaluation and Pilot Testing.** Submit with the annual progress report confirmation of compliance with this task.	**30 June 2016**
~~vii~~.	**Select Preferred Treatment Option and Complete Preliminary Design.** Submit with the annual progress report confirmation of compliance with this task.	**30 June 2017**

	Task	Date Due
vi.	**Complete Financing Plan.** Submit with the annual progress report a financing plan for the selected compliance project(s) and a schedule for obtaining funding.	30 June 2019
viii.	**Complete CEQA Documentation for Implementation of the Preferred Treatment Option.** File CEQA Submit environmental documents to the State Clearinghouse ~~and submit notice of determination~~.	**31 December 2019**
~~ix~~viii.	**Award Construction Bid.** Submit a letter confirming and describing detailed information on awarded construction bid process (e.g. date awarded, company, etc.).	**31 December 2020**
ix.	**Obtain Funding.** Submit with the annual progress report confirmation of compliance with this task.	**30 June 2021**
~~xi.~~	~~**Approval of Project by City Board.** Submit with the annual progress report confirmation of compliance with this task that includes a summary of the outcome of the City Board meeting (e.g., resolution on compliance alternative).~~	~~30 June 2021~~
xii.	**Complete Construction of Preferred Treatment Option.** Submit construction approval documentation.	**31 December 2023**
xiii.	**Final Compliance.** Submit report demonstrating compliance with the final effluent limits for nitrate plus nitrite.	**1 June 2024**

VII. COMPLIANCE DETERMINATION

A. **$CBOD_5$ and TSS Effluent Limitations (Section IV.A.1.a and b).** Compliance with the final effluent limitations for $CBOD_5$ and TSS required in Limitations and Discharge Requirements section IV.A.1.a shall be ascertained by 24-hour composite samples. Compliance with effluent limitations required in Limitations and Discharge Requirements section IV.A.1.b for percent removal shall be calculated using the arithmetic mean of $CBOD_5$ 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. **Total Mercury Mass Loading Effluent Limitations (Section IV.A.2.a). The procedures for calculating mass loadings are as follows:**

a. The total pollutant mass load for each individual calendar month shall be determined using an average of all concentration data collected that month and the corresponding total monthly flow. All effluent monitoring data collected under the monitoring and reporting program, pretreatment program, and any special studies shall be used for these calculations. The total annual mass loading shall be the sum of the individual calendar months.

b. In calculating compliance, the Discharger shall count all non-detect measures at one-half of the detection level. If compliance with the effluent limitation is not attained due to the non-detect contribution, the Discharger shall improve and implement available analytical capabilities and compliance shall be evaluated with consideration of the detection limits.

C. **Average Dry Weather Flow Effluent Limitations (Section IV.A.1.k).** The average dry weather discharge flow represents the 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 of daily flow measurements over three consecutive dry weather months (e.g., July, August, and September).

D. **Total Coliform Organisms Effluent Limitations (Section IV.A.1.j).** 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 2.2 per 100 milliliters, the Discharger will be considered out of compliance.

E. **Total Residual Chlorine Effluent Limitations (Section IV.A.1.gh).** 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. **Chronic Whole Effluent Toxicity Effluent Limitation (Section IV.A.1.hi).** Compliance with the accelerated monitoring and TRE provisions of Provision VI.C.2.a shall constitute compliance with the effluent limitation.

I. **Chlorpyrifos and Diazinon Effluent Limitations (Section IV.A.1.kl).** 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.

J. **Temperature Receiving Water Limitations (Section V.A.1615.b).** Compliance with the temperature receiving water limitation will be determined based on the difference in the temperature measured at RSW-002 as compared to RSW-002A. Due to the tidal nature of the receiving water, the direction of flow in the San Joaquin River shall be recorded at the time of sampling to ascertain which location is "upstream" or "downstream" of the Facility's discharge.

K. **Turbidity Receiving Water Limitations (Section V.A.1817.a-e).** Compliance with the turbidity receiving water limitations will be determined based on the change in turbidity measured at RSW-002 as compared to RSW-002A. Due to the tidal nature of the receiving water, the direction of flow in the San Joaquin River shall be recorded at the time of sampling

to ascertain which location (i.e. RSW-002 or RSW-002A) is upstream or downstream of the Facility's discharge.

L. **Temperature Effluent Limitations (Section IV.A.1.dg).** Compliance with the final effluent limitations for temperature shall be ascertained using the daily average effluent temperature at monitoring location EFF-001 and the temperature of the receiving water measured on the same day by grab sample at RSW-002 or RSW-002A, whichever is "upstream" at the time of sampling. Due to the tidal nature of the receiving water, the direction of flow in the San Joaquin River shall be recorded at the time of sampling to ascertain which location (i.e. RSW-002 or RSW-002A) is "upstream" of the Facility's discharge.

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.

Reporting Level (RL)
The RL is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the RL depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied in the computation of the RL.

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:

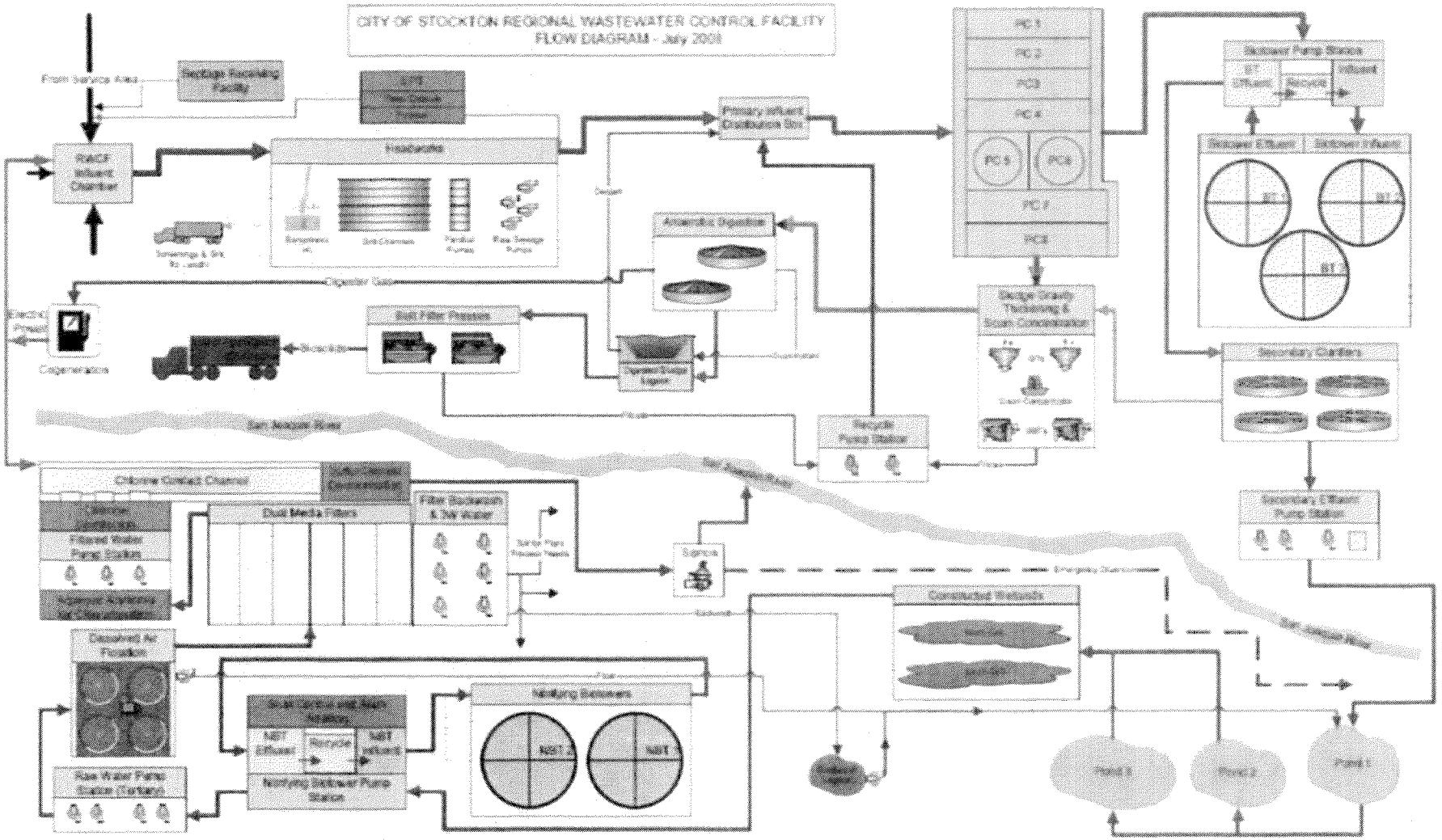
$$\sigma = (\sum[(x - \mu)^2]/(n - 1))^{0.5}$$

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

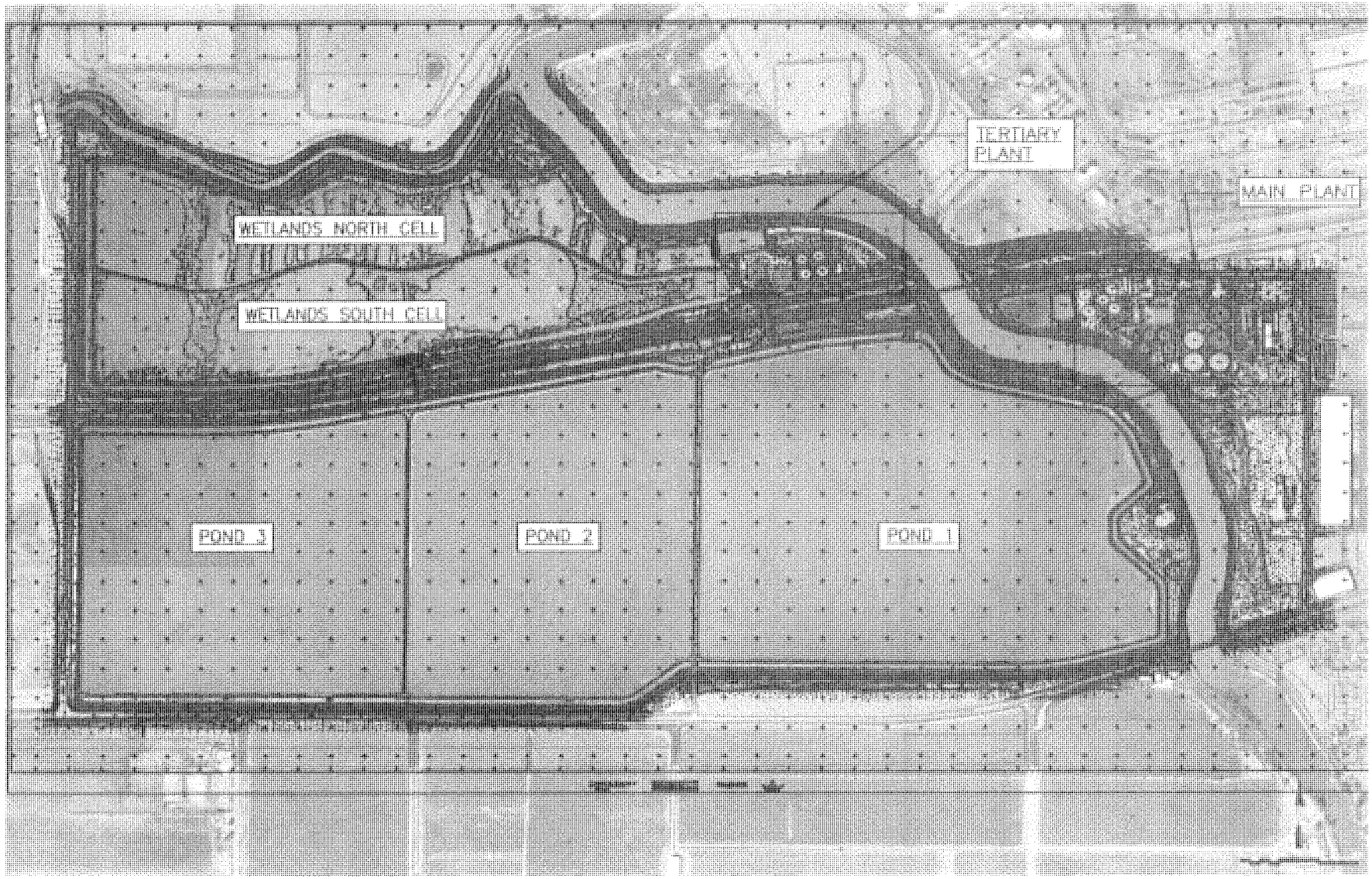
Toxicity Reduction Evaluation (TRE)
TRE is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first 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

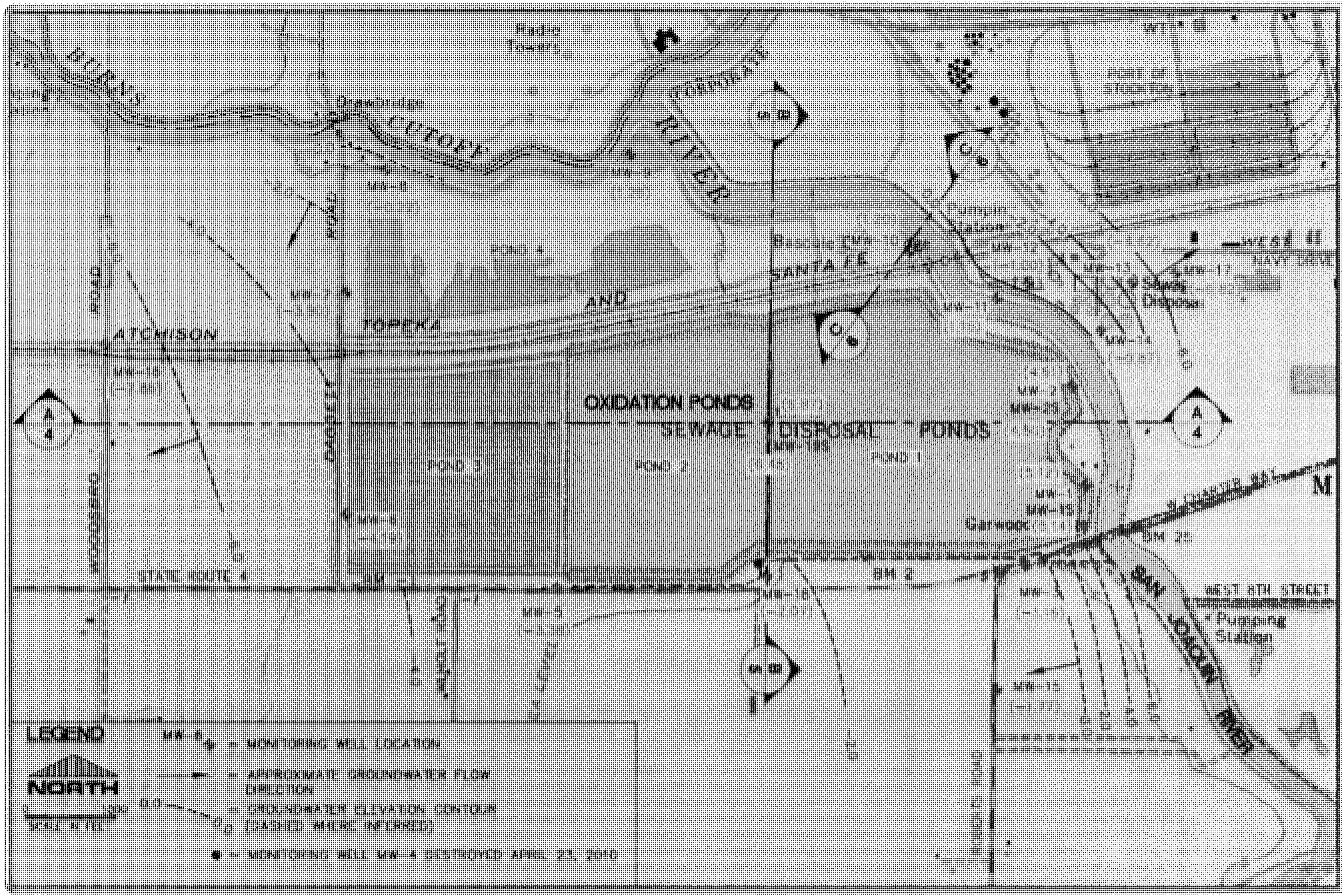
ATTACHMENT C – FLOW SCHEMATIC



TREATMENT PONDS AND WETLANDS



GROUNDWATER WELL MONITORING NETWORK CONTOUR MAP



ATTACHMENT D – STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (40 C.F.R. § 122.41(a).)

2. The Discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not yet been modified to incorporate the requirement. (40 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 (40 C.F.R. § 122.41(i); Wat. Code, § 13383):

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order (40 C.F.R. § 122.41(i)(1));

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (40 C.F.R. § 122.41(i)(2));

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (40 C.F.R. § 122.41(i)(3)); and

4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location. (40 C.F.R. § 122.41(i)(4).)

G. Bypass

1. Definitions

   a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. (40 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 Boardas 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 under 40 C.F.R. part 136 or, in the case of sludge use or disposal, approved under 40 C.F.R. part 136 unless otherwise specified in 40 C.F.R. part 503 unless other test procedures have been specified in this Order. (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.)

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).)

3. The alteration or addition results in a significant change in the Discharger's sludge use or disposal practices, and such alteration, addition, or change may justify the application of

permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. (40 C.F.R.§ 122.41(l)(1)(iii).)

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

G. Publicly-Owned Treatment Works (POTWs)

All POTWs 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).)

ATTACHMENT E – MONITORING AND REPORTING PROGRAM

Contents

Tables

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 Department of Public Health (DPH). Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the Central Valley Water Board. In the event a certified laboratory is not available to the Discharger for any onsite field measurements such as pH, DO, turbidity, temperature, and residual chlorine, such analyses performed by a noncertified laboratory will be accepted provided a Quality Assurance-Quality Control Program is instituted by the laboratory. A manual containing the steps followed in this program for any onsite field measurements such as pH, DO, turbidity, temperature, and residual chlorine must be kept onsite in the treatment facility laboratory and/or the plant operations division 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 the Department of Public Health (DPH), in accordance with the provision of Water Code section 13176, and must include quality assurance/quality control data with their reports.

G. The Discharger shall 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 can be obtained, prior to any additives, treatment processes, and plant return flows.
001	EFF-001	Location where a representative sample of the facility's effluent can be obtained prior to discharge into the receiving water. [Latitude: 37° 56' 15"; Longitude: 121° 20' 5"]
--	PND-~~001 – 003~~123C	Location where a representative composite sample of the ~~facultative~~ treatment ponds' wastewater can be obtained prior to transfer to the wetlands
--	RSW-001	San Joaquin River and Bowman Road, 8.0 miles south of Discharge Point No. 001.
--	RSW-001A	San Joaquin River, flow monitoring station located approximately 500 feet south of the Facility's outfall
--	RSW-002	San Joaquin River and Highway 4, 0.5 miles south of Discharge Point No. 001.
--	RSW-002A	San Joaquin River and Burns Cutoff, 0.5 miles north of Discharge Point No. 001.
--	RSW-003	San Joaquin River at Deep Water Channel, 1.5 miles north of Discharge Point No. 001.
--	RGW-001	Monitoring wells MW-1, MW-3, MW-5, MW-6, MW-7, MW-9, MW-10, MW-11, MW-12, MW-13, MW-16, MW-17 and MW-18 and any other well subsequently installed for the study required in Provision VI.C.7.b. of this Order
--	BIO-001	Biosolids prior to removal from the facility.

--	**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, as long as results are flow weighted.**

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 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	[1]
Carbonaceous Biochemical Oxygen Demand (CBOD) (5-day @ 20 Deg. C)	mg/L	24-hr Composite[2]	1/week	[1]
Total Suspended Solids (TSS)	mg/L	24-hr Composite[2]	1/week	[1]
pH[3]	Standard Units	Meter	Continuous	[1]
Electrical Conductivity	µmhos/cm @ 25°C	Grab[4]	1/month	[1]
Total Dissolved Solids		Grab[4]	1/month	[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] 24-hour flow proportional composite.

[3] Monitoring may be ceased for up to 30 minutes each day for cleaning and calibration of probes.

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

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF-001

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

Table E-3. Effluent Monitoring

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	mgd	Meter	Continuous	[1]
Conventional Pollutants				
Carbonaceous Biochemical Oxygen Demand (CBOD) (5-day @ 20 Deg. C)	mg/L	24-hr Composite [2]	3/Week	[1]
	lbs/day	Calculate	3/Week	--
Total Suspended Solids	mg/L	24-hr Composite [2]	3/Week	[1]
	lbs/day	Calculate	3/Week	--
pH[3]	Standard Units	Meter	Continuous	[1]
Priority Pollutants				
Bromoform	µg/L	Grab	1/Month	[1], [4], [5]
Chlorodibromomethane	µg/L	Grab	1/Month	[1], [4], [5]
Dichlorobromomethane	µg/L	Grab	1/Month	[1], [4], [5]
Mercury, Total Recoverable	µg/L	Grab	1/Month	[8]
Non-Conventional Pollutants				
Ammonia Nitrogen, Total (as N)	mg/L	24-hr Composite [2]	3/Week [4, 7]	[1]
	lbs/day	Calculate	3/Week	[1]
Chlorine, Total Residual	mg/L	Meter	Continuous	[6]
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/Week	[1]
Hardness (as $CaCO_3$)	mg/L	Grab	1/Month	[1]
Methylmercury	µg/L	Grab	1/~~Month~~ [8] Month	[8]
Nitrate Nitrogen, Total (as N)	mg/L	24-hr Composite [2]	1/~~Week~~ [10] Week [9]	[1]
Nitrite Nitrogen, Total (as N)	mg/L	24-hr Composite [2]	1/~~Week~~ [10] Week [9]	[1]
Temperature	°F	Meter	Continuous	[1]
Total Coliform Organisms	MPN/100 mL	Grab	3/~~Week~~ [10] Week [10]	[1]
Total Dissolved Solids	mg/L	Grab	1/Month	[1]
Sulfur Dioxide or Sodium Bisulfite	mg/L	Meter	Continuous	[1]
Turbidity	NTU	Meter	Continuous	[1]
Dissolved Oxygen	mg/L	Grab	1/day	[1]
Acute Toxicity	% Survival		1/Month	
Chronic Toxicity	TUc		1/Quarter	

[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] Monitoring may be ceased for up to 30 minutes each day for cleaning and calibration of probes.

~~[4] pH and temperature shall be recorded at the time of ammonia sample collection.~~

[4] 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 Table E-10).

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

[6] Total chlorine residual must be monitored with a method sensitive to and accurate at the permitted level of 0.01 mg/L.
[7] Concurrent with whole effluent toxicity monitoring.
[8] Unfiltered methyl mercury and total mercury samples shall be taken using clean hands/dirty hands procedures, as described in U.S. EPA method 1669: Sampling Ambient Water for Trace Metals at EPA Water Quality Criteria Levels, for collection of equipment blanks (section 9.4.4.2), and shall be analyzed by U.S. EPA method 1630/1631 (Revision E) with a reporting level of 0.05 ng/L for methyl mercury and 0.5 ng/L for total mercury.
[9] Monitoring for nitrite and nitrate shall be conducted concurrently.
[10] Samples for Total coliform organisms may be collected at any point following disinfection.

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 monthly acute toxicity testing, concurrent with effluent ammonia sampling.

2. *Sample Types* – The Discharger may use flow-through or static renewal testing. For static renewal testing, the samples shall be flow proportional 24-hour composites and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent monitoring location EFF-001.

3. *Test Species* – Test species shall be rainbow trout (*Oncorhynchus mykiss*).

4. *Methods* – The acute toxicity testing samples shall be analyzed using EPA-821-R-02-012, Fifth Edition. Temperature, total residual chlorine, and pH shall be recorded at the time of sample collection. No pH adjustment may be made unless approved by the Executive Officer.

5. *Test Failure* – If an acute toxicity test does not meet all test acceptability criteria, as specified in the test method, the Discharger must re-sample and re-test as soon as possible, not to exceed 7 days following notification of test failure.

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

1. *Monitoring Frequency* – The Discharger shall perform quarterly three species chronic toxicity testing.

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 the effluent monitoring location EFF-001. The receiving water control shall be a grab sample obtained from the RSW-001 sampling location, as identified in this Monitoring and Reporting Program.

3. *Sample Volumes* – Adequate sample volumes shall be collected to provide renewal water to complete the test in the event that the discharge is intermittent.

4. *Test Species* – Chronic toxicity testing measures sublethal (e.g., reduced growth, reproduction) and/or lethal effects to test organisms exposed to an effluent compared to that of the control organisms. The Discharger shall conduct chronic toxicity tests with:

   - The cladoceran, water flea, *Ceriodaphnia dubia* (survival and reproduction test);
   - The fathead minnow, *Pimephales promelas* (larval survival and growth test); and
   - The green alga, *Selenastrum capricornutum* (growth test).

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

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

7. *Dilutions* – For routine and accelerated chronic toxicity monitoring, it is not necessary to perform the test using a dilution series. The chronic toxicity testing shall be performed using 100% effluent and one control. If toxicity is found in any effluent test, the Discharger must conduct accelerated monitoring in accordance with Section VI.C.2.a of the Limitations and Discharge Requirements. For 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 for TRE Investigation

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 within 30 days following completion of the test, 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 monthly discharger self-monitoring reports shall contain an updated chronology of chronic toxicity test results expressed in TUc, and organized by test species, type of test (survival, growth or reproduction), and monitoring frequency, i.e., either quarterly, monthly, accelerated, or Toxicity Reduction Evaluation (TRE).

2. **Acute WET Reporting.** Acute toxicity test results shall be submitted with the monthly discharger self-monitoring reports and reported as percent survival.

3. **TRE Reporting.** Reports for TREs shall be submitted in accordance with the schedule contained in the Discharger's approved TRE Workplan, 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. RECEIVING WATER MONITORING REQUIREMENTS

A. Monitoring Location RSW-001, RSW-001A, RSW-002, RSW-002A, and RSW-003

1. The Discharger shall monitor San Joaquin River flow at RSW-001A. Flow information reported to the Discharger by the USGS, collected from the flow monitoring station located approximately 500 feet south of the outfall at RSW-001A shall be used. Flow will continue to be recorded in 15-minute intervals and reported within self-monitoring report as a daily net flow value in units of cubic feet per second.
2. The Discharger shall monitor the San Joaquin River at RSW-001, RSW-002, RSW-002A, and RSW-003 as follows:

Table E-5. Receiving Water Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Dissolved Oxygen	mg/L	Grab	1/week	
pH	Standard Units	Grab	1/week	
Temperature	°F (°C)	Grab	1/week	
Turbidity	NTUs	Grab	1/week	
Electrical Conductivity @ 25 Deg. C	µmhos/cm	Grab	1/week	
Ammonia Nitrogen, Total (as N)	mg/L	Grab	1/week	[1, 2]
Hardness (as $CaCO_3$)	mg/L	Grab	1/month	

[1] Temperature and pH shall be collected at the time of ammonia monitoring to allow for determination of ammonia toxicity.

[2] The ~~method detection~~reporting limit shall be at or below ~~0.1~~ 0.5 mg/L.

B. Visual Observations RSW-002, RSW-002A, and RSW-003

1. In conducting the weekly receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by RSW-002, RSW-002A, and RSW-003. A description, including at the minimum, the presence or absence of the following shall be recorded and summarized in the monthly self-monitoring reports.
   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.

C. Groundwater Monitoring Location RGW-001

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. The existing monitoring network currently consists of 21 active wells, including Monitoring Well Nos. MW-1, MW-1s, MW-2, MW-2s, MW-3, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-11, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, MW-18, MW-19 and MW-19s. Monitoring wells MW-1s, MW-2s, and MW-19s are scheduled to be closed, while monitoring wells MW-2, MW-8, MW-14, MW-15, and MW-19 are to become dormant, but maintained in operable condition.

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. All samples shall be collected using approved EPA methods. Water table elevations shall be calculated to determine groundwater gradient and direction of flow.

3. The Discharger shall monitor Monitoring Well Nos. MW-1, MW-7, MW-10, MW-12, MW-13, MW-17 and MW-18 as follows:

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]
Nitrite Nitrogen, Total (as N)	mg/L	Grab	2/Year	[2]
Nitrate Nitrogen, Total (as N)	mg/L	Grab	2/Year	[2]
Total Kjeldahl Nitrogen	mg/L	Grab	2/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.

4. The Discharger shall monitor Monitoring Well Nos. MW-3, MW-5, MW-6, MW-9, MW-11 and MW-16 as follows:

Table E-7. 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	--

[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.

VIII. OTHER MONITORING REQUIREMENTS

A. Biosolids

1. Monitoring Location BIO-001

a. A composite sample of sludge shall be collected annually at Monitoring Location BIO-001 in accordance with EPA's *POTW Sludge Sampling and Analysis Guidance Document*, August 1989, and tested for priority pollutants listed in 40 CFR Part 122, Appendix D, Tables II and III (excluding total phenols).

b. 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 CFR 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 sludge quantities generated and of handling and disposal activities. The frequency of entries is discretionary; however, the log must be complete enough to serve as a basis for part of the annual report.

B. Municipal Water Supply

1. Monitoring Location SPL-001

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

Table E-8. Municipal Water Supply Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Total Dissolved Solids[1]	mg/L	Grab	1/year	
Electrical Conductivity @ 25°C[1]	µmhos/cm	Grab	1/year	
Standard Minerals[2]	mg/L	Grab	1/year	

[1] If the water supply is from more than one source, the total dissolved solids and electrical conductivity shall be reported as a weighted average and include copies of supporting calculations.

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

C. Wastewater in ~~Facultative~~ Treatment Ponds – Monitoring Location~~s~~ PND-~~001 through PND-003~~123C

At a minimum, the Discharger shall monitor wastewater impounded in each Facility pond(s) at PND-~~001 through PND-003~~123C as required in Table E-~~10~~9, below.

Table E-9. Pond(s) Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Dissolved Oxygen[1]	mg/L	Grab	1/week	
pH	Standard Units	Grab	1/week	
Freeboard	feet	--	1/week	
Total Dissolved Solids	mg/L	Grab	2/year[2]	
Electrical Conductivity	µmhos/cm	Grab	2/year[2]	
~~Ammonia (as N)~~	~~mg/L~~	~~Grab~~	~~2/year[2]~~	
Nitrate (as N)	mg/L	Grab	2/year[2]	
Nitrite (as N)	mg/L	Grab	2/year[2]	
Total Kjeldahl Nitrogen	mg/L	Grab	2/year[2]	
~~Boron~~	~~mg/L~~	~~Grab~~	~~2/year[2]~~	
~~Chloride~~	~~mg/L~~	~~Grab~~	~~2/year[2]~~	
~~Dissolved Iron~~	~~mg/L~~	~~Grab~~	~~2/year[2]~~	
~~Dissolved Manganese~~	~~mg/L~~	~~Grab~~	~~2/year[2]~~	
~~Sodium~~	~~mg/L~~	~~Grab~~	~~2/year[2]~~	

[1] Samples shall be collected at a depth of one foot from each pond in use, opposite the inlet. Samples shall be collected between 0700 and 0900 hours.

[2] Grab samples shall be collected from each pond at the specified sampling frequency and combined to create one composite sample.

D. Effluent and Receiving Water Characterization

1. **Bi-Monthly Monitoring (2017).** Bi-monthly (i.e. every other month) samples shall be collected from the effluent and upstream receiving water (EFF-001 and RSW-001) and analyzed for the constituents listed in Table E-10, below. Bi-monthly monitoring shall be conducted during 2017 (6 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.

Table E-10. Effluent and Receiving Water Characterization Monitoring

Parameter	Units	Effluent Sample Type	Maximum Reporting Level[1]
2- Chloroethyl vinyl ether	µg/L	Grab	1
Acrolein	µg/L	Grab	2
Acrylonitrile	µg/L	Grab	2
Benzene	µg/L	Grab	0.5
Bromoform	µg/L	Grab[2]	0.5
Carbon Tetrachloride	µg/L	Grab	0.5
Chlorobenzene	µg/L	Grab	0.5
Chloroethane	µg/L	Grab	0.5

Parameter	Units	Effluent Sample Type	Maximum Reporting Level[1]
Chloroform	µg/L	Grab	2
Chloromethane	µg/L	Grab	2
Dibromochloromethane	µg/L	Grab[2]	0.5
Dichlorobromomethane	µg/L	Grab[2]	0.5
Dichloromethane	µg/L	Grab	2
Ethylbenzene	µg/L	Grab	2
Hexachlorobenzene	µg/L	Grab	1
Hexachlorobutadiene	µg/L	Grab	1
Hexachloroethane	µg/L	Grab	1
Methyl bromide (Bromomethane)	µg/L	Grab	1
Naphthalene	µg/L	Grab	10
Parachlorometa cresol	µg/L	Grab	
Tetrachloroethene	µg/L	Grab	0.5
Toluene	µg/L	Grab	2
trans-1,2-Dichloroethylene	µg/L	Grab	1
Trichloroethene	µg/L	Grab	2
Vinyl chloride	µg/L	Grab	0.5
Methyl-tert-butyl ether (MTBE)	µg/L	Grab	
Trichlorofluoromethane	µg/L	Grab	
1,1,1-Trichloroethane	µg/L	Grab	0.5
1,1-dichloroethane	µg/L	Grab	0.5
1,1-dichloroethylene	µg/L	Grab	0.5
1,2-dichloropropane	µg/L	Grab	0.5
1,3-dichloropropylene	µg/L	Grab	0.5
1,1,2-Trichloro-1,2,2-Trifluoroethane	µg/L	Grab	
1,2,4-trichlorobenzene	µg/L	Grab	1
1,2-dichoroethane	µg/L	Grab	0.5
1,2-dichlorobenzene	µg/L	Grab	0.5
1,3-dichlorobenzene	µg/L	Grab	0.5
1,4-dichlorobenzene	µg/L	Grab	0.5
Styrene	µg/L	Grab	
Xylenes	µg/L	Grab	
1,2-Benzanthracene	µg/L	Grab	5
1,2-Diphenylhydrazine	µg/L	Grab	1
2-Chlorophenol	µg/L	Grab	5
2,4-Dichlorophenol	µg/L	Grab	5
2,4-Dimethylphenol	µg/L	Grab	2
2,4-Dinitrophenol	µg/L	Grab	5
2,4-Dinitrotoluene	µg/L	Grab	5
2,4,6-Trichlorophenol	µg/L	Grab	10
2,6-Dinitrotoluene	µg/L	Grab	5
2-Nitrophenol	µg/L	Grab	10
2-Chloronaphthalene	µg/L	Grab	10
3,3'-Dichlorobenzidine	µg/L	Grab	5
3,4-Benzofluoranthene	µg/L	Grab	10
4-Chloro-3-methylphenol	µg/L	Grab	5
4,6-Dinitro-2-methylphenol	µg/L	Grab	10
4-Nitrophenol	µg/L	Grab	10
4-Bromophenyl phenyl ether	µg/L	Grab	10
4-Chlorophenyl phenyl ether	µg/L	Grab	5

Parameter	Units	Effluent Sample Type	Maximum Reporting Level[1]
Acenaphthene	µg/L	Grab	1
Acenaphthylene	µg/L	Grab	10
Anthracene	µg/L	Grab	10
Benzidine	µg/L	Grab	5
Benzo(a)pyrene (3,4-Benzopyrene)	µg/L	Grab	2
Benzo(g,h,i)perylene	µg/L	Grab	5
Benzo(k)fluoranthene	µg/L	Grab	2
Bis(2-chloroethoxy) methane	µg/L	Grab	5
Bis(2-chloroethyl) ether	µg/L	Grab	1
Bis(2-chloroisopropyl) ether	µg/L	Grab	10
Bis(2-ethylhexyl) phthalate	µg/L	Grab	5
Butyl benzyl phthalate	µg/L	Grab	10
Chrysene	µg/L	Grab	5
Di-n-butylphthalate	µg/L	Grab	10
Di-n-octylphthalate	µg/L	Grab	10
Dibenzo(a,h)-anthracene	µg/L	Grab	0.1
Diethyl phthalate	µg/L	Grab	10
Dimethyl phthalate	µg/L	Grab	10
Fluoranthene	µg/L	Grab	10
Fluorene	µg/L	Grab	10
Hexachlorocyclopentadiene	µg/L	Grab	5
Indeno(1,2,3-c,d)pyrene	µg/L	Grab	0.05
Isophorone	µg/L	Grab	1
N-Nitrosodiphenylamine	µg/L	Grab	1
N-Nitrosodimethylamine	µg/L	Grab	5
N-Nitrosodi-n-propylamine	µg/L	Grab	5
Nitrobenzene	µg/L	Grab	10
Pentachlorophenol	µg/L	Grab	1
Phenanthrene	µg/L	Grab	5
Phenol	µg/L	Grab	1
Pyrene	µg/L	Grab	10
Aluminum	µg/L	24-hr Composite	
Antimony	µg/L	24-hr Composite	5
Arsenic	µg/L	24-hr Composite	10
Asbestos	µg/L	24-hr Composite	
Barium	µg/L	24-hr Composite	
Beryllium	µg/L	24-hr Composite	2
Cadmium	µg/L	24-hr Composite	0.5
Chromium (III)	µg/L	24-hr Composite	50
Chromium (VI)	µg/L	24-hr Composite	10
Copper	µg/L	24-hr Composite	0.5
Cyanide	µg/L	24-hr Composite	5
Fluoride	µg/L	24-hr Composite	
Iron	µg/L	24-hr Composite	
Lead	µg/L	24-hr Composite	0.5
Mercury	µg/L	Grab	0.5
Manganese	µg/L	24-hr Composite	
Molybdenum	µg/L	24-hr Composite	
Nickel	µg/L	24-hr Composite	20
Selenium	µg/L	24-hr Composite	5

Parameter	Units	Effluent Sample Type	Maximum Reporting Level[1]
Silver	µg/L	24-hr Composite	0.25
Thallium	µg/L	24-hr Composite	1
Tributyltin	µg/L	24-hr Composite	
Zinc	µg/L	24-hr Composite	20
4,4'-DDD	µg/L	24-hr Composite	0.05
4,4'-DDE	µg/L	24-hr Composite	0.05
4,4'-DDT	µg/L	24-hr Composite	0.01
alpha-Endosulfan	µg/L	24-hr Composite	0.02
alpha-Hexachlorocyclohexane (BHC)	µg/L	24-hr Composite	0.01
Alachlor	µg/L	24-hr Composite	
Aldrin	µg/L	24-hr Composite	0.005
beta-Endosulfan	µg/L	24-hr Composite	0.01
beta-Hexachlorocyclohexane	µg/L	24-hr Composite	0.005
Chlordane	µg/L	24-hr Composite	0.1
delta-Hexachlorocyclohexane	µg/L	24-hr Composite	0.005
Dieldrin	µg/L	24-hr Composite	0.01
Endosulfan sulfate	µg/L	24-hr Composite	0.05
Endrin	µg/L	24-hr Composite	0.01
Endrin Aldehyde	µg/L	24-hr Composite	0.01
Heptachlor	µg/L	24-hr Composite	0.01
Heptachlor Epoxide	µg/L	24-hr Composite	0.01
Lindane (gamma-Hexachlorocyclohexane)	µg/L	24-hr Composite	0.02
PCB-1016	µg/L	24-hr Composite	0.5
PCB-1221	µg/L	24-hr Composite	0.5
PCB-1232	µg/L	24-hr Composite	0.5
PCB-1242	µg/L	24-hr Composite	0.5
PCB-1248	µg/L	24-hr Composite	0.5
PCB-1254	µg/L	24-hr Composite	0.5
PCB-1260	µg/L	24-hr Composite	0.5
Toxaphene	µg/L	24-hr Composite	0.5
Atrazine	µg/L	24-hr Composite	
Bentazon	µg/L	24-hr Composite	
Carbofuran	µg/L	24-hr Composite	
2,4-D	µg/L	24-hr Composite	
Dalapon	µg/L	24-hr Composite	
1,2-Dibromo-3-chloropropane (DBCP)	µg/L	24-hr Composite	
Di(2-ethylhexyl)adipate	µg/L	24-hr Composite	
Dinoseb	µg/L	24-hr Composite	
Diquat	µg/L	24-hr Composite	
Endothal	µg/L	24-hr Composite	
Ethylene Dibromide	µg/L	24-hr Composite	
Methoxychlor	µg/L	24-hr Composite	
Molinate (Ordram)	µg/L	24-hr Composite	
Oxamyl	µg/L	24-hr Composite	
Picloram	µg/L	24-hr Composite	
Simazine (Princep)	µg/L	24-hr Composite	
Thiobencarb	µg/L	24-hr Composite	
2,3,7,8-TCDD (Dioxin)	µg/L	24-hr Composite	

Parameter	Units	Effluent Sample Type	Maximum Reporting Level[1]
2,4,5-TP (Silvex)	µg/L	24-hr Composite	
Diazinon	µg/L	24-hr Composite	
Chlorpyrifos	µg/L	24-hr Composite	
Ammonia (as N)	mg/L	24-hr Composite[2]	
Boron	µg/L	24-hr Composite	
Chloride	mg/L	24-hr Composite	
Flow	MGD	Meter	
Hardness (as $CaCO_3$)	mg/L	Grab	
Foaming Agents (MBAS)	µg/L	24-hr Composite	
Mercury, Methyl	ng/L	Grab	
Nitrate (as N)	mg/L	24-hr Composite[2]	
Nitrite (as N)	mg/L	24-hr Composite[2]	
pH	Std Units	Grab[2]	
Phosphorus, Total (as P)	mg/L	24-hr Composite	
Specific conductance (EC)	µmhos/cm	24-hr Composite	
Sulfate	mg/L	24-hr Composite	
Sulfide (as S)	mg/L	24-hr Composite	
Sulfite (as SO_3)	mg/L	24-hr Composite	
Temperature	°C	~~Grab~~Meter	
Total Dissolved Solids (TDS)	mg/L	~~24-hr Composite~~Grab	
Total Kjeldahl Nitrogen (TKN)	mg/L	24-hr Composite	
Total Organic Carbon (TOC)	mg/L	24-hr Composite	
Dissolved Organic Carbon (DOC)	mg/L	24-hr Composite	

[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] Receiving water characterization monitoring only.

IX. 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 (SMR's)

1. The Discharger shall electronically submit SMR's 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, and annual SMR's including the results of all required monitoring using U.S. EPA-approved test methods or other test methods specified in this Order. SMR's 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/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
3/week	Permit Effective Date	Sunday through Saturday	Submit with monthly SMR
1/month	Permit Effective Date	First day of calendar month through last day of calendar month	First day of second calendar month following month of sampling
1/quarter	Permit Effective Date	1 January through 31 March	May 1 of the same year
		1 April through 30 June	August 1 of the same year
		1 July through 30 September	November 1 of the same year
		1 October through 31 December	February 1 of the next year
2/year	Permit Effective Date	1 January through 30 June	August 1 of the same year
		1 July through 31 December	February 1 of the next year
1/year	Permit Effective Date	1 January through 31 December	February 1 of the next 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 SMR's 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.

7. With the exception of flow, all constituents monitored on a continuous basis (metered), shall be reported as daily maximums, daily minimums, and daily averages; flow shall be reported as the total volume discharged per day for each day of discharge.

~~7.~~ 8. The Discharger shall submit in the SMR's calculations and reports in accordance with the following requirements:

a. **Average Dry Weather Flow.** The Discharger shall calculate and report the average dry weather flow for the effluent. The average dry weather flow shall be calculated as specified in Section VII.C and reported in the December SMR.

b. **Calendar Annual Average Limitations**. For constituents with effluent limitations specified as "annual average" (electrical conductivity) the Discharger shall report the calendar annual average in the December SMR. The annual average shall be calculated as the average of the monthly averages gathered for the calendar year.

c. **Chlorpyrifos and Diazinon Effluent Limitations**. The Discharger shall calculate and report the value of SAMEL and SMDEL for the effluent, using the equation in Effluent Limitations IV.A.1.I and consistent with the Compliance Determination language specified in Section VII.I.

d. **Mass Loading Limitations**. For $CBOD_5$, 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.

e. **Removal Efficiency ($CBOD_5$ and TSS).** The Discharger shall calculate and report the percent removal of $CBOD_5$ and TSS in the SMRs. The percent removal shall be calculated as specified in Section VII.A. of the Limitations and Discharge Requirements.

f. **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.D. of the Limitations and Discharge Requirements.

g. **Turbidity Receiving Water Limitations**. The Discharger shall calculate and report the turbidity change in the receiving water between RSW-002 and RSW-002A applicable to the natural turbidity condition specified in Section V.A.17.a-e of the Limitations and Discharge Requirements. Due to the tidal nature of the receiving water, the direction of flow in the San Joaquin River shall be recorded at the time of sampling to ascertain which location (i.e. RSW-002 or RSW-002A) is "upstream" or "downstream" of the Facility's discharge.

g. **Temperature Receiving Water Limitations**. The Discharger shall calculate and report the temperature change in the receiving water due to the effluent based on the difference in temperature at RSW-002 and RSW-002A. Due to the tidal nature of the receiving water, the direction of flow in the San Joaquin River shall be

recorded at the time of sampling to ascertain which location (i.e. RSW-002 or RSW-002A) is "upstream" or "downstream" of the Facility's discharge.

h. **Temperature Effluent Limitation**. For every day receiving water temperature samples are collected at RSW-002 and RSW-002A, the Discharger shall calculate and report the temperature difference between the effluent and "upstream" receiving water based on the difference in the daily average temperature at EFF-001 and temperature of grab samples collected at RSW-002 or RSW-002A, depending on the direction of San Joaquin River flow at the time of sampling. Due to the tidal nature of the receiving water, the direction of flow in the San Joaquin River shall be recorded at the time of sampling to ascertain which location (i.e. RSW-002 or RSW-002A) is "upstream" of the Facility's discharge.

C. Discharge Monitoring Reports (DMR's)

1. At any time during the term of this permit, the State Water Board or Central Valley Water Board may notify the Discharger to electronically submit DMR's. Until such notification is given specifically for the submittal of DMR's, the Discharger shall submit DMR's in accordance with the requirements described below.

2. DMR's must be signed and certified as required by the standard provisions (Attachment D). The Discharger shall submit the original DMR and one copy of the DMR to the address listed below:

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

3. All discharge monitoring results must be reported on the official U.S. EPA pre-printed DMR forms (EPA Form 3320-1) or on self-generated forms that follow the exact same format of EPA Form 3320-1.

D. Other Reports

1. Special Study ~~Reports and~~ Progress Reports. As specified in the compliance time schedules required in the Special Provisions contained in section VI of the Order, special study and progress reports shall be submitted in accordance with the following reporting requirements. ~~At minimum, the progress reports shall include a discussion of the status of final compliance, whether the Discharger is on schedule to meet the final compliance date, and the remaining tasks to meet the final compliance date.~~

Table E-12. Reporting Requirements for Special Provisions Reports

Special Provision	Reporting Requirements
Pollution Prevention Plan for Mercury and Compliance Schedule for Methylmercury, Progress Reports (Provisions VI.C.3.a and VI.C.7.a)	**30 January**, annually, beginning 30 January 2015
Pollution Prevention Plan for Salinity, Progress Reports (Provision VI.C.3.b)	**1 June**, annually, beginning 1 June 2015

Special Provision	Reporting Requirements
Phase 1 Methylmercury Control Study Progress Report (Special Provision VI.C.7.a)	**20 October 2015**
Groundwater Limitations and BPTC Compliance Schedule, Progress Reports (Special Provision VI.C.7.b)	**1 June**, annually, beginning 1 June 2016
Nitrate plus Nitrite Compliance Schedule (Special Provision VI.C.7.c)	**30 June**, annually, beginning 30 June 2015

2. The Discharger shall report the results of any acute and chronic toxicity testing, TIE, and Pollution Prevention Plan required by Special Provisions – VI.C.3.a and b. The Discharger shall report the progress in satisfaction of compliance schedule dates specified in Special Provisions – VI.C.7. The Discharger shall submit reports with the first monthly SMR scheduled to be submitted on or immediately following the report due date in compliance with SMR reporting requirements described in subsection IX.B above.

3. By **15 August 2014**, the Discharger shall submit a report outlining reporting levels (RLs), method detection limits, and analytical methods for approval. The Discharger shall comply with the monitoring and reporting requirements for CTR constituents as outlined in section 2.3 and 2.4 of the SIP. The maximum required reporting levels for priority pollutant constituents shall be based on the Minimum Levels (MLs) contained in Appendix 4 of the SIP, determined in accordance with Section 2.4.2 and Section 2.4.3 of the SIP. In accordance with Section 2.4.2 of the SIP, when there is more than one ML value for a given substance, the Central Valley Water Board shall include as RLs, in the permit, all ML values, and their associated analytical methods, listed in Appendix 4 that are below the calculated effluent limitation. The Discharger may select any one of those cited analytical methods for compliance determination. If no ML value is below the effluent limitation, then the Central Valley Water Board shall select as the RL, the lowest ML value, and its associated analytical method, listed in Appendix 4 for inclusion in the permit. Table E-10 (Attachment E) provides required maximum reporting levels in accordance with the SIP.

4. **Annual Operations Report.** By 30 January of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

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

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

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

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

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

5. **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.

      Sludge sampling and analysis shall be ~~sampled during the same 24-hour period and analyzed for the same pollutants as the influent and effluent sampling and analysis. The sludge analyzed shall be a composite sample of a minimum of 12 discrete samples taken at equal time intervals over the 24-hour period~~conducted according to Section VIII.A of the monitoring and reporting program, and sampled during the same 24-hour period and analyzed for the same pollutants as the influent and effluent sampling and analysis. ~~Wastewater and sludge sampling and analysis shall be performed at least annually.~~ The Discharger shall also provide any influent, effluent or sludge monitoring data for nonpriority pollutants which may be causing or contributing to Interference, Pass-Through or adversely impacting sludge quality. Sampling and analysis shall be performed in accordance with the techniques prescribed in 40 CFR 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 CFR 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 CFR 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 CFR 403.8(f)(2)(viii).

Pretreatment Program reports shall be submitted to the Central Valley Water Board and the:

State Water Resources Control Board
Division of Water Quality
1001 I Street or P.O. Box 100
Sacramento, CA 95812

and the

Regional Administrator
U.S. Environmental Protection Agency WTR-5
75 Hawthorne Street
San Francisco, CA 94105

ATTACHMENT F – FACT SHEET

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Tables

ATTACHMENT F – FACT SHEET

As described in section I, 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	5B390107001
Discharger	City of Stockton
Name of Facility	Regional Wastewater Control Facility
Facility Address	2500 Navy Drive
	Stockton, CA 95206
	San Joaquin County
Facility Contact, Title and Phone	Margaret Orr, Deputy Director of Wastewater, (209) 937-5125
Authorized Person to Sign and Submit Reports	Margaret Orr, Deputy Director of Wastewater, (209) 937-5125
Mailing Address	SAME
Billing Address	SAME
Type of Facility	Publicly Owned Treatment Works
Major or Minor Facility	Major
Threat to Water Quality	1
Complexity	A
Pretreatment Program	Yes
Recycling Requirements	No
Facility Permitted Flow	55 million gallons per day (mgd), average dry weather flow (ADWF)
Facility Design Flow	55 mgd
Watershed	Sacramento-San Joaquin Delta
Receiving Water	San Joaquin River
Receiving Water Type	Sacramento-San Joaquin Delta

A. The City of Stockton (hereinafter Discharger) is the owner and operator of the City of Stockton Regional Wastewater Control Facility (hereinafter Facility), a publicly owned treatment works (POTW). The City of Stockton owns the property at 2500 Navy Drive, Stockton, CA, on which the Facility is located.

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 San Joaquin River, a water of the United States, within the Sacramento-San Joaquin Delta. The Discharger was previously regulated by Order R5-2008-0154 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA0079138 adopted by the Central Valley Water Board on 23 October 2008, and amended by Order R5-2014-~~XXXX~~-0054 on 28 March 2014. The NPDES permit expired on 1 October 2013. Further, Time Schedule Order R5-2013-0101 (TSO) was adopted by the Central Valley Water Board on 26 July 2013, and established a time schedule for the Discharger to comply with chlorodibromomethane and dichlorobromomethane effluent limitations established in Order R5-2008-0154. Attachment B provides a map of the area around the Facility. Attachment C provides a flow schematic of the Facility, treatment ponds and wetlands.

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 and submitted an application for reissuance of its WDR's and NPDES permit on 3 April 2013. The application was deemed complete on 3 April 2013 and Order R5-2008-0154 administratively extended on 16 May 2013. A site visit was conducted on 27 June 2013, 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 City of Stockton, Port of Stockton and surrounding unincorporated areas of San Joaquin County and serves a population of approximately 326,000. The design daily average flow capacity of the Facility is 55 million gallons per day (mgd). The Facility's average daily inflow flow rate is approximately 28 mgd and the average effluent discharge rate is approximately 26 mgd. The City's service area encompasses over 116,000 sewer connections and approximately 900 miles of sanitary sewer lines. Sources of wastewater in the service area are primarily domestic, but also include both commercial and industrial connections. In total, there are 51 significant industrial users (SIUs) in the service area.

A. Description of Wastewater and Biosolids Treatment and Controls

The Facility is situated on both the eastern and western banks of the San Joaquin River. The plant is connected via a bridge over the River. The plant has primary treatment, secondary treatment, and sludge processing facilities east of the river. Water is then routed over the River for further secondary treatment at secondary waste stabilization ponds and constructed wetlands followed by tertiary treatment and disinfection facilities. Final treated effluent is discharged to the San Joaquin River via siphon to a submerged open pipe outfall.

At the section of the plant east of the San Joaquin River, treatment facilities include screening, grit removal, raw sewage pumps, and primary sedimentation where settling is enhanced. After wastewater passes through the primary clarifiers it is pumped to the biotower treatment process and then routed to the secondary clarifiers. Effluent from the secondary clarifiers is pumped from the east side of the Facility beneath the San Joaquin River to the pond system. Additional secondary treatment and water storage is available in the ponds on the west side of the river. Secondary and tertiary treatment is also available in engineered treatment wetlands. The use of the ponds and wetlands for treatment or diversion past the ponds and wetlands to other tertiary treatment are optional flow paths dependent on a variety of operational factors.

Effluent from the ponds, wetlands, or diversion structures (as applicable) is then routed to the tertiary treatment system.

Tertiary treatment consists of the nitrifying biotower for ammonia removal, then pumping to the dissolved air floatation units where removal efficiencies are enhanced through chemical addition. The water is then routed through the duel media tertiary filters, and disinfected using chlorination/dechlorination prior to discharge to the San Joaquin River. At the section of the plant east of the San Joaquin River, solids from the primary and secondary sedimentation processes are either routed to gravity thickeners, gravity belt thickeners or pumped to the anaerobic digesters directly. After anaerobic digestion, sludge is routed to the sludge lagoon or a holding tank. Digested solids are removed from the lagoons by a dredge or pumped directly to holding tanks where they are further conditioned and dewatered using belt filter presses. Dewatered solids are hauled off-site by a private contractor and routinely recycled on agricultural lands as a source of nutrients and soil amendment. In an emergency, solids can be used as daily cover for solid waste at the landfill.

B. Discharge Points and Receiving Waters

1. The Facility is located in T1, R6E, 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 San Joaquin River, a water of the United States at a point latitude 37° 56' 15" N and longitude 121° 20' 05" W.

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

Effluent limitations/discharge specifications contained in the existing Order for discharges from Discharge Point No. 001 and representative monitoring data from the term of the previous Order are as follows:

Table F-2. Historic Effluent Limitations and Monitoring Data

Parameter	Units	Effluent Limitation			Monitoring Data (1 January 2009 thru 31 December 2012)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
Aluminum, Total Recoverable	µg/L	311	--	750	350	--	350
Ammonia, Total (as N)	mg/L	2	--	5	6.01	--	10.6
	lbs/day	917	--	2294	1393	--	2800
Bis(2-ethylhexyl) phthalate	µg/L	1.8	--	3.6	1.04	--	1.04
Chlorodibromomethane	µg/L	5.0	--	16	28	--	28
Total Coliform Organisms	MPN/ 100ml	--	--	--	--	--	--
Cyanide, Total Recoverable	µg/L	4.1	--	9.0	2.7	--	17
Dichlorobromomethane	µg/L	6.8	--	20	14	--	14

Parameter	Units	Effluent Limitation			Monitoring Data (1 January 2009 thru 31 December 2012)		
		Average Monthly	Average Weekly	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
Manganese, Total Recoverable	µg/L	--	--	286	--	--	32
Molybdenum, Total Recoverable	µg/L	--	--	13	--	--	7.7
Nitrate + Nitrite, as N	µg/L	40	--	--	23	--	--
pH	s.u.	--	--	6.5 – 8.5	--	--	6.2 – 7.3
Total Suspended Solids (TSS)	mg/L	10	15	20	2.88	3.55	6.4
	lbs/day	4,590	6,885	9,180	659	813	1,254
5-Day CBOD @ 20°C	mg/L	10	15	20	2.09	2.4	13
	lbs/day	4,590	6,885	9,180	503	609	2,498
Acute Toxicity	% Survival	--	--	[1]	--	--	95[2]
Temperature	°F	--	--	[3]	--	--	15.3[4]
Average Dry Weather Flow	mgd	--	--	[5]	--	--	38.2
Electrical Conductivity[6] @ 25°C	µmhos/ cm	--	--	1,300	--	--	1,041
Mercury	lbs	--	--	[7]	--	--	--

[1] Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall not be less than 70% for any one bioassay and 90% median for any three or more consecutive bioassays.
[2] Minimum percent survival of the monitoring data.
[3] The maximum effluent temperature shall not exceed the natural receiving water temperature by more than 20°F.
[4] Maximum difference between the effluent temperature and the natural receiving water temperature.
[5] The average dry weather discharge flow shall not exceed 55 mgd.
[6] Annual average effluent limitation.
[7] The total annual mass discharge of total mercury shall not exceed 0.92 pounds.

D. Compliance Summary

The Discharger reported the following effluent limitation violations and mandatory minimum penalties were assessed, as summarized below, for the period of January 2009 thru February 2013:

Month/Year	# of Violations	Constituent	Units	Reported Result or Range	Effluent Limitation	Note
November 2010	1	Chlorine, Total Residual	mg/L	0.65	0.02	[1]
December 2010	3	Ammonia, Total	mg/L	5.1 – 7.9	5	[2]
January 2011	17	Ammonia, Total	mg/L	5.5 – 10.6	5	[2]
January 2011	1	Ammonia, Total	mg/L	6.1	2	[3]
January 2011	1	Ammonia, Total	mg/L	2800	2294	[4]
January 2011	1	Ammonia, Total	mg/L	1435	917	[5]
February 2011	2	Ammonia, Total	mg/L	5.6	5	[2]
February 2011	5	Chlorine, Total Residual	mg/L	0.3	0.02	[1]
February 2011	1	Ammonia, Total	mg/L	2.9	2	[3]
September 2012	1	Chlorodibromomethane (Dibromochloromethane)	µg/L	28	16	[2]
September 2012	1	Chlorodibromomethane (Dibromochloromethane)	µg/L	28	5	[3]

Month/Year	# of Violations	Constituent	Units	Reported Result or Range	Effluent Limitation	Note
February 2013	6	Ammonia, Total	mg/L	6.2 – 9.7	5	[2]
February 2013	1	Ammonia, Total	mg/L	3.7	2	[3]
February 2013	3	Ammonia, Total	mg/L	2410 – 2685	2294	[4]
TOTAL:	43					

[1] 1-hr average effluent limitation.
[2] Daily maximum effluent limitation.
[3] Average monthly effluent limitation.
[4] Daily maximum mass-based effluent limitation.
[5] Monthly average mass-based effluent limitation.

E. Planned Changes

The Discharger recently completed construction of a permanent blending system that provides a blend of secondary effluent with wetland effluent which is directly routed to the nitrifying biotowers. This construction was performed in compliance with Cleanup and Abatement Order R5-2011-0702.

On 9 August 2011, the Stockton City Council adopted Resolution No. 11-0221, which approved and adopted the *Regional Wastewater Control Facility Capital Improvement and Energy Management Plan* (CIP), prepared by Corollo Engineers, August 2011. The CIP provides a framework for the repairs and improvements to the Facility. The planned repairs and improvements may occur in the immediate near-term and, if funding is available, during the term of this Order. The CIP lists forty-six individual projects that are necessary to repair aging infrastructure, extend the useful life of existing facilities, and improve working conditions at the Facility. A list of planned projects is provided in **Table F-3** below. While several of these projects are expected to be completed in the permit term, further project assessment, prioritization, and available funding will dictate actual project completion schedules.

Table F-3. CIP Improvement Projects

♦ Hypochlrorite, bisulfite, and support facilities	♦ Tertiary support building improvements
♦ Cold weather nitrifying biotower supply system	♦ Energy efficiency measures
♦ Site security upgrades	♦ Energy management system
♦ Headworks and raw sewage pump rehabilitation	♦ Secondary biotowers rehabilitation
♦ Auxiliary peak wet weather pump station and piping	♦ River crossing forcemain rehabilitation
♦ Secondary clarifier rehabilitation	♦ Connection of 60 KV to SCADA
♦ Fifth secondary clarifier	♦ Dual electrical feed for substation and switchgear
♦ Secondary effluent pump station replacement	♦ Main plant flood study
♦ Gravity sludge thickener rehabilitation	♦ Raw sewage pump AFD's enclosure
♦ Gravity belt thickener improvements	♦ Roof repairs
♦ Dewatering facility replacement	♦ Gravity thickener MCC replacement
♦ Anaerobic digester rehabilitation	♦ Gravity thickener/sludge collector rehabilitation
♦ Sludge lagoon demolition	♦ Secondary clarifier collector rehabilitation
♦ Fat, oils, grease receiving station	♦ Cathodic protection
♦ Cogeneration – gas dryer	♦ Painting and coating
♦ Primary clarifier improvements	♦ Paving
♦ Wetlands rehabilitation and reconfiguration	♦ Telemetry
♦ Third nitrifying biotower	♦ Scum thickener replacement
♦ Tertiary filters rehabilitation	♦ Secondary effluent pump station installment
♦ Administration building expansion	♦ Dissolved air flotation units rehabilitation
♦ Laboratory building	♦ Tertiary 12 KV powerline evaluation

♦ Maintenance and collection building expansion	♦ PLC replacement at tertiary plant
♦ Operations building improvements	♦ Oxidation ponds rehabilitation

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 for the Water Quality Control Plan, Fourth Edition (Revised October 2011), for the Sacramento and San Joaquin River Basins (hereinafter Basin Plan) on 13 October 2011 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 San Joaquin River are as follows:

Table F-4. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	San Joaquin River	Existing: Municipal and domestic supply (MUN); agricultural supply and stock watering (AGR); industrial process water supply (PROC), industrial service supply (IND); water contact recreation (REC-1); other non-contact water recreation (REC-2); warm freshwater aquatic habitat (WARM); cold freshwater aquatic habitat (COLD); warm and cold fish migration habitat (MIGR); warm spawning habitat (SPAWN); wildlife habitat (WILD); commercial and sport fishing (COMM) and navigation (NAV).

   b. **Bay-Delta Plan**. The *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan) was adopted in

May 1995 by the State Water Board superseding the 1991 Bay-Delta Plan. The Bay-Delta Plan identifies the beneficial uses of the estuary and includes objectives for flow, salinity, and endangered species protection.

The State Water Board adopted Decision 1641 (D-1641) on 29 December 1999, and revised on 15 March 2000. D-1641 implements flow objectives for the Bay-Delta Estuary, approves a petition to change points of diversion of the Central Valley Project and the State Water Project in the Southern Delta, and approves a petition to change places of use and purposes of use of the Central Valley Project. The water quality objectives of the Bay-Delta Plan are implemented as part of this Order.

c. **Thermal Plan.** The State Water Board adopted a Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan) on 18 May 1972, and amended this plan on 18 September 1975. This plan contains temperature objectives for inland surface waters. The Thermal Plan is applicable to this discharge. For purposes of the Thermal Plan, the Discharger is considered to be an Existing Discharger of Elevated Temperature Waste. The Thermal Plan in section 5.A., requires the following:

"5. Estuaries

A. Existing discharges

(1) Elevated temperature waste discharges shall comply with the following:

a. The maximum temperature shall not exceed the natural receiving water temperature by more than 20°F.

b. Elevated temperature waste discharges either individually or combined with other discharges shall not create a zone, defined by water temperatures of more than 1°F above natural receiving water temperature, which exceeds 25 percent of the cross-sectional area of a main river channel at any point.

c. No discharge shall cause a surface water temperature rise greater than 4°F above the natural temperature of the receiving waters at any time or place.

d. Additional limitations shall be imposed when necessary to assure protection of beneficial uses.

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. Resolution 68-16 is deemed to incorporate the federal antidegradation policy where the federal policy applies under federal law. Resolution 68-16 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 State Water Board Resolution 68-16.

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. **Human Right to Water Act.** 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.

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 CFR Parts 122, 123, and 124. The NPDES Industrial Storm Water Program regulates storm water discharges from wastewater treatment facilities. Wastewater treatment plants are applicable industries under the storm water program and are obligated to comply with the federal regulations. 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 CFR Part 130, et seq.)." The Basin Plan also states, "*Additional treatment beyond minimum federal standards will be imposed on dischargers to [WQLSs]. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.*" The listing for the San Joaquin River includes: chloropyrifos; DDT; diazinon; dioxin; electrical conductivity (EC); exotic species; furan compounds; group A pesticides; mercury; pathogens; PCBs; and unknown toxicity.

2. **Total Maximum Daily Loads (TMDLs).** USEPA requires the Central Valley Water Board to develop TMDLs for each 303(d) listed pollutant and water body combination. Table F-5, below, identifies the 303(d) listings and the status of each TMDL for waterways in the southern Delta.

Table F-5. 303 (d) List for Delta Waterways (southern portion)

Pollutant	Potential Sources	TMDL Completion (Year)
Chlorpyrifos	Agriculture/Urban Runoff/Storm Sewers	2007
DDT (Dichlorodiphenyltrichloroethane)	Agriculture	[1]
Diazinon	Agriculture/Urban Runoff/Storm Sewers	2007
Electrical Conductivity	Agriculture	2019
Organo-chlorine Group A Pesticides	Agriculture	[1]
Invasive Species	Source Unknown	2019
Mercury	Resource Extraction	2009
Unknown Toxicity	Source Unknown	2019

[1] TMDL completion date will be updated when the next 303(d) list is updated.

3. The 303(d) listings and TMDLs have been considered in the development of the Order. A pollutant-by-pollutant evaluation of each pollutant of concern is described in section IV.C.3 of this Fact Sheet.

E. Other Plans, Polices and Regulations

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

   a. The waste consists primarily of domestic sewage and treated effluent;

   b. The waste discharge requirements are consistent with water quality objectives; and

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

b. **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 for surface waters of the Sacramento-San Joaquin Delta (Delta) and upstream tributaries below the first major dams. The project area is bounded by Shasta Dam on the Sacramento River, Millerton Dam on the San Joaquin River, and Folsom Dam on the American River. The Drinking Water Policy was adopted to protect the municipal and domestic supply (MUN) beneficial use and pertains to the following drinking water constituents of concern: organic carbon, Cryptosporidium, Giardia, salt and nutrients. The Policy includes a narrative water quality objective and implementation provisions for Cryptosporidium and Giardia to specifically protect the public water system component of the MUN beneficial use. Approval of the Policy by the State Water Board, USEPA, and the Office of Administrative Law is expected by 2014.

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

Effluent limitations and toxic and pretreatment effluent standards established pursuant to sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the CWA and amendments thereto are applicable to the discharge.

The CWA mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law [33 U.S.C., §1311(b)(1)(C); 40 CFR 122.44(d)(1)]. NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met. This requirement applies to narrative criteria as well as to criteria specifying maximum amounts of particular pollutants. Pursuant to federal regulations, 40 CFR 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that "are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality." Federal regulations, 40 CFR 122.44(d)(1)(vi), further provide that "[w]here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits."

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

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

A. Discharge Prohibitions

1. **Prohibition III.A (No discharge or application of waste other than that described in this Order).** This prohibition is based on Water Code section 13260 that requires filing of a report of waste discharge (ROWD) before discharges can occur. The Discharger submitted a ROWD for the discharges described in this Order; therefore, discharges not described in this Order are prohibited.

2. **Prohibition III.B (No bypasses or overflow of untreated wastewater, except under the conditions at CFR Part 122.41(m)(4)).** As stated in section I.G of Attachment D, Standard Provisions, this Order prohibits bypass from any portion of the treatment facility. Federal regulations, 40 CFR 122.41(m), define "bypass" as the intentional diversion of waste streams from any portion of a treatment facility. This section of the federal regulations, 40 CFR 122.41(m)(4), prohibits bypass unless it is unavoidable to prevent loss of life, personal injury, or severe property damage. In considering the 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 CFR 122.41(m), as allowing bypass only for essential maintenance to assure efficient operation.

3. **Prohibition III.C (No controllable condition shall create a nuisance).** This prohibition is based on Water Code section 13050 that requires water quality objectives established for the prevention of nuisance within a specific area. The Basin Plan prohibits conditions that create a nuisance

4. **Prohibition III.D (No inclusion of pollutant free wastewater shall cause improper operation of the Facility's systems).** This prohibition is based on CFR Part 122.41 et seq. that requires the proper design and operation of treatment facilities

B. Technology-Based Effluent Limitations

1. Scope and Authority

Section 301(b) of the CWA and implementing 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.

2. Applicable Technology-Based Effluent Limitations

a. **Carbonaceous Biochemical Oxygen Demand (5-Day @ 20°C) ($CBOD_5$) and Total Suspended Solids (TSS).** Federal regulations, 40 CFR, Part 133, establish the minimum weekly and monthly average level of effluent quality attainable by secondary treatment for $CBOD_5$ and TSS. Tertiary treatment is necessary to protect the beneficial uses of the receiving stream and the final effluent limitations for $CBOD_5$ and TSS are based on the technical capability of the tertiary process. The secondary and tertiary treatment standards for $CBOD_5$ and TSS are indicators of the effectiveness of the treatment processes. The principal design parameter for wastewater treatment plants is the daily $CBOD_5$ and TSS loading rates and the corresponding removal rate of the system. In applying CFR 40 Part 133 for weekly and monthly average $CBOD_5$ and TSS limitations, the application of tertiary treatment processes results in the ability to achieve lower levels for $CBOD_5$ and TSS than the secondary standards currently prescribed; therefore these limitations have been revised to 15 mg/L (weekly average) and 10 mg/L (monthly average), which is technically based on the capability of a tertiary system. In addition to these limits, a daily maximum effluent limitation of 20 mg/L for $CBOD_5$ and for TSS is included in this Order to ensure that the treatment works are not organically overloaded and operate in accordance with design capabilities.

   Also, 40 CFR 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 $CBOD_5$ and TSS over each calendar month.

b. **Flow.** The Facility was designed to provide a tertiary level of treatment for up to a design flow of 55 mgd. Therefore, this Order contains an average dry weather discharge flow effluent limit of 55 mgd.

c. **pH.** The secondary treatment regulations at 40 CFR Part 133 also require that pH be maintained between 6.0 and 9.0 standard units.

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

Table F-6. Summary of Technology-based Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Flow	mgd	55[1]	-	-	-	-
Carbonaceous Biochemical Oxygen Demand, 5-day @ 20°C ($CBOD_5$)[2]	mg/L	10	15	20	-	-
	lbs/day[3]	4600	6900	9200	-	-
Total Suspended Solids (TSS)[1]	mg/L	10	15	20	-	-
	lbs/day[3]	4600	6900	9200	-	-
pH[4]	SU	-	-	-	6.0	9.0

[1] Permitted average dry weather flow.
[2] The average monthly percent removal of CBOD 5-day 20°C and total suspended solids shall not be less than 85 percent.
[3] Based on a design capacity of 55 mgd.
[4] More stringent water quality-based effluent limitations are required for pH based on the Basin Plan's water quality objective for pH, as discussed in Section IV.C.3.

C. Water Quality-Based Effluent Limitations (WQBELs)

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 tertiary treatment or equivalent requirements or other provisions, is discussed in section IV.C.3.c.vii of this 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, water quality-based effluent limitations (WQBELs) 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 WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable water quality objectives and criteria that are contained in other state plans and policies, or any applicable water quality criteria contained in the CTR and NTR.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

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

The Basin Plan on page II-1.00 states: "*Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning...*" and with respect to disposal of wastewaters states that "*...disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses.*" The federal CWA section 101(a)(2), states: "it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water be achieved by July 1, 1983." Federal Regulations, developed to implement the requirements of the CWA, create a rebuttable presumption that all waters be designated as fishable and swimmable. Federal Regulations, 40 CFR sections 131.2 and 131.10, require that all waters of the State regulated to protect the beneficial uses of public water supply, protection and propagation of fish, shell fish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation. Section 131.3(e), 40 CFR, defines existing beneficial uses as those uses actually attained after 28 November 1975, whether or not they are included in the water quality standards. Federal Regulation, 40 CFR section 131.10 requires that uses be obtained by implementing effluent limitations, requires that all downstream uses be protected and states that in no case shall a state adopt waste transport or waste assimilation as a beneficial use for any waters of the United States.

a. **Receiving Water and Beneficial Uses.** 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 1 January 2009 through 31 December 2012, which includes effluent and ambient background data submitted in SMRs and the Report of Waste Discharge (ROWD).

c. **Assimilative Capacity/Mixing Zone.**

   i. **Receiving Water Characteristics.** The Facility discharges to the San Joaquin River within the Sacramento-San Joaquin Delta approximately 1.5 miles upstream of the Stockton Deep Water Ship Channel. The outfall consists of a 4-ft diameter pipe located on the south bank of the channel. The river width at the outfall location is approximately 250 ft, and river depth is approximately 15 ft at mean low tide. San Joaquin River flow is strongly tidal at the outfall, with flows moving past the outfall several times before the net San Joaquin River flow pushes the water into the Deep Water Ship Channel. South Delta water supply pumping operations affect the San Joaquin River flow at the Facility's outfall. There is a tidal flow measurement station, installed and maintained by the U.S. Geological Survey (USGS), in the San Joaquin River approximately ½ mile upstream of the Facility's outfall. Based on flow data at

the measurement station, the maximum tidal flow is approximately 3,000 cfs during peak flood and ebb tides.

ii. **Regulatory Guidance for Dilution Credits and Mixing Zones.** The Discharger has requested mixing zones and dilution credits for compliance with human health carcinogen and water quality criteria. The Central Valley Water Board has the discretion to accept or deny mixing zones and dilution credits. 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 TMDLs, in establishing and determining compliance with effluent limitations for applicable human health, acute aquatic life, or chronic aquatic life priority pollutant criteria/objectives or the toxicity objective for aquatic life protection in a basin plan, the Regional Board may grant mixing zones and dilution credits to dischargers...The applicable priority pollutant criteria and objectives are to be met through a water body except within any mixing zone granted by the Regional Board. The allowance of mixing zones is discretionary and shall be determined on a discharge-by-discharge basis. The Regional Board may consider allowing mixing zones and dilution credits only for discharges with a physically identifiable point of discharge that is regulated through an NPDES permit issued by the Regional Board.*" [*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]

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

iii. **Dilution/Mixing Zone Study Results.** The dilution method provided in the SIP assumes a constant diluting flow in the river. However, because the San Joaquin River is tidal, the flow of dilution water varies with the tidal cycle. Tidal action impacts receiving water with multiple doses of the effluent as the river flows downstream past the discharge, reverses moving upstream past the discharge a second time, then again reverses direction and passes the discharge point a third time as the net flow conveys the effluent down the river. Because of the flow complexities at the discharge site, it is necessary to determine effluent dilution using numerical models of the river system. In the studies described below, the Delta Simulation Model II (DSM2) was used.

DSM2 is a one-dimensional computer model developed by the Delta Modeling Section of California Department of Water Resources (DWR) for simulation of hydrodynamics, water quality, and particle transport in the Delta. A model grid representing the network of Delta channels was developed by DWR to cover major Delta channels, the Sacramento River upstream to the City of Sacramento, and the San Joaquin River upstream to Vernalis. DSM2 was calibrated and validated in 1997 by DWR and in 2000 by a group of agencies, water users and stakeholders. In 2009, DSM2 was calibrated and validated again to account for morphological changes, such as the flooded Liberty Island, and bathymetry, hydrodynamic and water quality data collected after the 2000 calibration.

(a) **Human Carcinogen Criteria Mixing Zone Studies.** To support a mixing zone request for a human carcinogen criteria the Discharger submitted a mixing zone study, "Evaluation of San Joaquin River Tidal Flow Dilution at the Stockton Regional Wastewater Control Facility" (Jones and Stokes, May 2005), and a human carcinogenic impact study final report, "Stockton Regional Wastewater Control Facility Human Carcinogen Impact Study Phase 2A: Basin Plan Calculation of Additive Toxicity Ratio" (EOA, Inc., 17 May 2006). These studies tracked tidal movement during various tidal stages, estimated the cumulative tidal flow volume that moved past the discharge, analyzed the long-term average dilution flow, and evaluated the upstream flow at Vernalis combined with the diversions in the Old River to estimate the net flows within the vicinity of the discharges.

Additionally, the April 2013 Report of Waste Discharge included a dilution analysis (*Appendix G, Dilution Analysis for City of Stockton Regional Wastewater Control Facility Discharge to the San Joaquin River)* which used measured flow data from the USGS station during the period of 20 August 1995 through 30 December 2012 and the Delta Simulation Model II (DSM2) to develop an appropriate estimate of effluent dilution in the San Joaquin River. Based on the findings of these studies, there is available dilution for human carcinogen criteria.

Table F-7 below summarizes the long-term average (LTA) effluent and receiving water fractions (as a percent), the corresponding LTA dilution ratio, and approximate distance of the DSM2 node from the Facility's outfall.

Table F-7. LTA Effluent Fraction, Corresponding Dilution Ratio and Distance from Outfall

DSM2 Node	LTA Effluent Fraction	LTA River Fraction	LTA Dilution (part river: 1 part effluent)	Approximate Distance from Outfall	
				Direction	Miles
12	0.3	99.7	332	upstream	4.4
13	1.1	98.9	90	upstream	2.8
14	4.2	95.8	23	upstream	1.4
15	11.0	89.0	8	upstream	0.4
16	9.5	90.5	10	downstream	0.7
18	10.7	89.3	8	downstream	1.7
19	11.3	88.7	8	downstream	2.4
20	10.7	89.3	8	downstream	3.1

DSM2 Node	LTA Effluent Fraction	LTA River Fraction	LTA Dilution (part river: 1 part effluent)	Approximate Distance from Outfall	
				Direction	Miles
21	8.8	91.2	10	downstream	3.9
22	8.2	91.8	11	downstream	5.0
23	8.0	92.0	12	downstream	6.3
24	7.8	92.2	12	downstream	6.9
25	6.7	93.3	14	downstream	8.4
26	5.8	94.2	16	downstream	9.0
29	4.1	95.9	23	downstream	10.4
30	2.9	97.1	33	downstream	11.7
32	1.5	98.5	66	downstream	12.8
33	1.1	98.9	90	downstream	13.8

Based on the findings of the human carcinogenic mixing zone evaluation study and the human carcinogenic impact study, a dilution credit of 13:1 is protective of the MUN beneficial use. Therefore, this Order grants a 13:1 dilution credit applicable to the human carcinogen criteria, with a mixing zone that extends 1.4 miles upstream and 8.4 miles downstream of the discharge (within this section of the San Joaquin River, the downstream is wider than the upstream section). The estimated size of the mixing zone is based on the DSM2 modeling that evaluated the tidal movement up and downstream from the discharge. The nearest drinking water intake is more than 10 miles from the discharge.

(b) **Nitrate Mixing Zone Study.** Order R5-2008-0154 allowed a dilution credit for nitrate plus nitrite. Robertson-Bryan, Inc. prepared a report entitled "Evaluation of the Potential Effects of Nitrate plus Nitrite Discharged from the Stockton Regional Wastewater Control Facility on the San Joaquin River in Support of Dilution Credit for NPDES Permitting" (Nitrate Study, July 2013) on behalf of the City of Stockton. The purpose of the report was to determine if continuing to grant a dilution credit in this renewed permit could be allowed, based on study findings and consistency with the SIP requirements for granting a dilution credit. The MCL for nitrate plus nitrite is 10 mg/L (as N). The dilution credit allowed in Order R5-2008-0154 resulted in a year-round effluent limitation for nitrate plus nitrite of 40 mg/L (as N). The Discharger has proposed, based on its nitrate mixing zone study, seasonal average monthly effluent limitations of 26 mg/L (as N) for the period April-September and 30 mg/L (as N) for October-March. The requested mixing zone would extend 1.4 miles upstream and 1.7 miles downstream of the Facility's outfall.

DSM2 was utilized to model the effluent fraction within the San Joaquin River upstream and downstream of the Facility's outfall and to determine the fraction of the Facility's effluent at Delta drinking water intake locations. Additionally, the Nitrate Study included modeling to evaluate the Facility's effluent mixing and San Joaquin River velocities to better understand algae community composition and structure. Monitoring was conducted at 11 sites and included basic water quality parameters, vegetation, benthic macroinvertebrate (BMI) community, algae

community, nitrate and nitrite. Key modeling results of the proportion of Facility effluent are as follows:

Waterway	Proportion of Effluent to Waterway	Averaging Period
Majority of Delta channels and at most Drinking Water Intakes	< 1%	Long-term Average
South Delta and at Drinking Water Intakes (Banks and Jones)	< 2%	Long-term Average
South Delta and at Drinking Water Intakes (Banks and Jones)	< 3.4-6.6%	Maximum Daily

In regards to nitrate, the incremental contribution of nitrate from the Facility to south Delta drinking water intakes, when discharging current effluent quality at the permitted ADWF capacity of 55 MGD, would range from 0.9 to 2 mg/L (as N) on a maximum daily basis (depending on south Delta intake location) and on a long-term average basis the maximum incremental contribution to the south Delta intakes would range from approximately 0.2 to 0.5 mg/L (as N). In addition, none of the drinking water intake locations show nitrate concentrations near or above the 10 mg/L (as N) drinking water MCL. Nitrate concentrations at the south Delta pumping plants are typically already above 0.5 mg/L (as N), which indicates that nutrient levels are sufficiently high to enable algal blooms in the water conveyance systems.

The density of potentially harmful algal species observed in river samples was generally greater in the San Joaquin reference reach than in the mixing zone. Additionally, there was no evidence to suggest that the Facility's discharge caused adverse changes in the algae or BMI communities within the San Joaquin reference reach. Submerged and emergent vegetation covered less than 1% of the surface area at each sampling location and are either confined to within a few feet of the shore in the shallow river margins or to small patches of water hyacinth and Brazilian waterweed that uprooted and floated downstream in the mid-channel.

iv. **Evaluation of Available Dilution for Human Carcinogen Criteria.** Section 1.4.2.2 of the SIP, provides that mixing zones should not be allowed at or near drinking water intakes. Furthermore, regarding the application of a mixing zone for protection of human health, the TSD states that, "*...the presence of mixing zones should not result in significant health risks, when evaluated using reasonable assumptions about exposure pathways. Thus, where drinking water contaminants are a concern, mixing zones should not encroach on drinking water intakes.*" Based on the Discharger's mixing zone studies, a human carcinogen criteria dilution credit of 13:1 is allowed. The human carcinogen criteria mixing zone meets the requirements of the SIP as follows:

(a) *Shall not compromise the integrity of the entire waterbody* - The TSD states that, "If the total area affected by elevated concentrations within all mixing zones combined is small compared to the total area of a waterbody

(such as a river segment), then mixing zones are likely to have little effect on the integrity of the waterbody as a whole, provided that the mixing zone does not impinge on unique or critical habitats." The San Joaquin River is approximately 330 miles long. The human carcinogen criteria mixing zone is small as compared to the San Joaquin River. Therefore, the mixing zone does not compromise the integrity of the entire waterbody.

(b) *Shall not cause acutely toxic conditions to aquatic life passing through the mixing zone* – Bromoform, chlorodibromomethane, and dichlorobromomethane are not toxic to aquatic life. Therefore, acutely toxic conditions will not occur in the mixing zone.

(c) *Shall not restrict the passage of aquatic life* – Bromoform, chlorodibromomethane, and dichlorobromomethane are not toxic to aquatic life. Therefore, the mixing zone will not restrict the passage of aquatic life.

(d) *Shall not adversely impact biologically sensitive or critical habitats, including, but not limited to, habitat of species listed under federal or State endangered species laws* – Bromoform, chlorodibromomethane, and dichlorobromomethane are not toxic to aquatic life. Therefore, the mixing zone will not impact biologically sensitive or critical habitats.

(e) *Shall not produce undesirable or nuisance aquatic life; result in floating debris, oil, or scum; produce objectionable color, odor, taste, or turbidity; cause objectionable bottom deposits; cause nuisance* – The allowance of a human carcinogen criteria mixing zone will not produce undesirable or nuisance aquatic life, result in floating debris, oil, or scum; produce objectionable color, odor, taste, or turbidity; cause objectionable bottom deposits; or cause nuisance.

(f) *Shall not dominate the receiving water body or overlap a mixing zone from different outfalls* – As discussed in subsection (a), above, the human carcinogen criteria mixing zone is small relative to the water body, so it will not dominate the water body. Furthermore, the mixing zone does not overlap mixing zones from other outfalls.

(g) *Shall not be allowed at or near any drinking water intake* – There are no drinking water intakes within the human carcinogen criteria mixing zone. The nearest drinking water intake is about 10 miles from the discharge.

The human carcinogen criteria mixing zone therefore complies with the SIP. The mixing zone also complies with the Basin Plan, which requires that the 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 considered the procedures and guidelines in the EPA's *Water Quality Standards Handbook, 2d Edition* (updated July 2007), Section 5.1, and Section 2.2.2 of the TSD. The SIP incorporates the same guidelines.

v. **Evaluation of Available Dilution for Nitrate plus Nitrite, as N.** The Discharger requested a mixing zone for nitrate plus nitrite for compliance with the DPH Primary MCL implementing the Basin Plan's narrative chemical constituent objective for the protection of the MUN beneficial use. However, the discharge of nitrate may also impact aquatic life beneficial uses. Excessive nitrates in drinking water pose a human health concern, particularly for human

fetuses and infants (Primary MCL protects human health). Excessive nitrogen in the form of nitrates can also contribute to excessive algal growth and change the ecology of a waterbody[1], which has impacts to aquatic life and municipal uses. Consequently, for nutrients, the most stringent water quality objectives are the Basin Plan's narrative biostimulatory substances objective and narrative taste and odor objective.

The Central Valley Water Board is concerned with the effects of the discharge of nutrients, including nitrate and nitrite, on biologically sensitive aquatic resources and critical habitats, as are present in the Sacramento-San Joaquin Delta (Delta) and the impact of nutrients on the use of the water for municipal uses. The recent decline in pelagic fishes in the Delta is referred to as the Pelagic Organism Decline (POD). The POD refers to the decline in indices representing the abundance of delta smelt, longfin smelt, striped bass, and threadfin shad, since approximately 2000. *Multiple stressors may be leading to POD, including top-down effects (e.g., water diversion, predation), bottom-up effects (e.g., food availability and quality), and the effects of changes in physical and chemical fish habitat (e.g., water quality, contaminants, disease, toxic effects of toxic algal blooms) (Sommer et al. 2007).*[2]

The Discharger's mixing zone study indicates that at the current discharge rate of 30 MGD the discharge increases nitrate concentrations at the State Water Project and Central Valley Project Pumping Plants up to 0.3~~29~~ mg/L (as N) on a long-term average and up to 1.0 mg/L (as N) as a daily maximum. Increased nutrient loads can create excessive algal growth in the Delta, resulting in impacts to municipal drinking water supplies.[3] Increased algal growth can result in increased concentrations of total organic carbon that negatively impacts municipal drinking water suppliers, because it may result in the creation of harmful byproducts during chlorination. High ~~algae~~ nutrient levels in source water can also impact water conveyance systems and treatment plants, because algae can clog filters and reduce the efficiency of filtration, and algae and aquatic weeds can clog conveyance systems. In addition, some species of bluegreen algae are associated with the production of compounds such as geosmin and 2-methylisoborneol (MIB) that impart objectionable odors and tastes to waters, even at very low concentrations. These impacts are occurring, therefore, any increased nutrient loading contributes to the impairment of the beneficial uses.

In order to satisfy the mixing zone requirements of the SIP, the Discharger's July 2013 Nitrate Study evaluated predominantly near-field impacts in and around the discharge that would comprise the mixing zone. Based on the results of the Nitrate Study it appears that a mixing zone based on the primary MCL for nitrate plus nitrite to protect human health meets the SIP's mixing

[1] Glibert, P.M. 2010. Long-term change in nutrient loading and stoichiometry and their relationships with changes in food web and dominant pelagic fish species in the San Francisco Estuary, California. Reviews in Fisheries Science, 18(2):211-232
Glibert, P.M., et al. 2011. Ecological stoichiometry, biogeochemical cycling, invasive species, and aquatic food webs: San Francisco Estuary and comparative systems. Reviews in Fisheries Science, 19(4):358-417

[2] Sommer, T.R., et al. 2007. The collapse of pelagic fishes in the upper San Francisco Estuary. Reviews in Fisheries Science, 32:270-277

[3] Heidel, K., et al. 2006. Conceptual Model for Nutrients in the Central Valley and Sacramento-San Joaquin Delta

zone requirements. However, the applicable water quality objectives in this case are the Basin Plan's narrative biostimulatory objective and narrative taste and odor objective. Based on the Nitrate Study findings regarding the far-field impacts of the discharge, there is currently no assimilative capacity for nutrients in order to allow a mixing zone. The Discharger's Nitrate Study on page 28 states the following, "None of the locations [modeled far-field sites] showed nitrate concentrations near or above the 10 mg/L-N drinking water MCL; thus, the incremental contribution of nitrate under either effluent scenario would not cause or contribute to exceedance of the MCL. Furthermore, given the information discussed in the literature review section, since nitrate concentrations at Banks and Jones pumping plants are general well above 0.5 mg/L-N, it is unlikely that incremental contributions of nitrate under either effluent limitation scenario would cause algal blooms in SWP or CVP facilities downstream of the intakes, or result in undesirable taste and odors for downstream water users, *when they otherwise would not occur.*" (*emphasis added*) This information acknowledges that nutrient levels are already high at the Delta export pumps, such that there are sufficient nutrients for algal blooms. This is consistent with information in the record, as discussed above, that algal blooms occur in the water conveyance systems. It may be argued whether incremental nutrient loadings by the Facility discharge would cause additional algal blooms. However, that issue is irrelevant, because in order to allow a mixing zone there must be a demonstration that assimilative capacity exists. The Nitrate Study confirms that nutrient levels are elevated and assimilative capacity is not available for compliance the Basin Plan's narrative water quality objectives for biostimulatory substances and tastes and odors.

For the reasons discussed above, the requested mixing zone for nitrate plus nitrite is denied.

vi. **Evaluation of Available Dilution for Specific Constituents (Pollutant-by-Pollutant Evaluation).** When determining to allow dilution credits for a specific pollutant several factors must be considered, such as, available assimilative capacity, facility performance, and best practicable treatment or control (BPTC). In this subsection a pollutant-by-pollutant evaluation of dilution is discussed.

(a) **Bromoform.** The receiving water contains assimilative capacity for bromoform and a mixing zone for this constituent meets the mixing zone requirements of the SIP. Section 1.4.2.2 of the SIP requires that, "*A mixing zone shall be as small as practicable.*", and Section 1.4.2.2.B requires, "*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.*" As shown in the table below, based on existing Facility performance, the Facility can meet more stringent WQBELs for this constituent than with the full allowance of dilution. Therefore, this Order grants an 8:1 dilution credit applicable to the human carcinogen criteria for bromoform, with a mixing zone that extends approximately 0.4 miles upstream and 1.7 miles downstream of the discharge (within this section of the San Joaquin River, the downstream is wider than the upstream section).This represents a mixing zone that is as small as practicable for this Facility and that fully complies with the SIP.

Dilution credits allowed 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 the maximum dilution credit on a constituent-by-constituent basis needed for this discharge is shown in the following table.

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

Pollutant	Units	ECA[1]	Criterion	Background	Dilution Credit[2]
Bromoform	µg/L	~~37~~ 438	4.3	0.16	8:1

1 Equivalent to the performance-based AMEL.

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

$$D = (ECA - C) / (C - B)$$

Furthermore, the Central Valley Water Board finds that granting of the full dilution credits could allocate an unnecessarily large portion of the receiving water's assimilative capacity for these constituents and could violate the Antidegradation Policy. Although the Antidegradation Policy does not apply within a mixing zone, the allowance of a mixing zone allows an increase in the discharge of pollutants. Therefore, when a mixing zone and dilution credits are allowed, it is necessary to ensure the discharge complies with the Antidegradation Policy outside the mixing zone. The Antidegradation Policy requires that any activity that results in a discharge to a high quality water is required to meet BPTC of the discharge necessary to avoid a pollution or nuisance and to maintain the highest water quality consistent with maximum benefit to the people of the State. In this case, at minimum, BPTC is assumed to be existing Facility performance. Allowing the full dilution credit would allow the Discharger to increase its loading of these constituents to the San Joaquin River and reduce the treatment or control of the pollutants. The Central Valley Water Board has not been provided information indicating such reduced level of treatment or control would constitute BPTC pursuant to the Antidegradation Policy. Should this information be provided, dilution credits exceeding existing facility performance may be considered for the facility; provided the proposed dilution and associated mixing zone are consistent with applicable regulatory requirements.

(b) **Chlorodibromomethane and Dichlorobromomethane.** The receiving water contains assimilative capacity for chlorodibromomethane and dichlorobromomethane and mixing zones for these constituents meets the mixing zone requirements of the SIP. Section 1.4.2.2 of the SIP requires that, "*A mixing zone shall be as small as practicable.*", and Section 1.4.2.2.B requires, "*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.*" As shown in the table below, based on existing Facility performance, the Facility will require the full allowance of dilution. These represent mixing zones that are as small as practicable for this Facility and that fully comply with the SIP.

Dilution credits allowed 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 the maximum dilution credit on a constituent-by-constituent basis needed for this discharge is shown in the following table.

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

Pollutant	ECA[1]	Criterion	Background	Dilution[2]	AMEL	MDEL
Chlorodibromomethane (µg/L)	5.10	0.41	0.049	13:1	5.1	14
Dichlorobromomethane (µg/L)	7.44	0.56	0.031	13:1	7.44	14

~~[1] Equivalent to the performance-based AMEL~~
~~[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)~~

In addition, TSO Order R5-2014-XXXX (adopted 5/6 June 2014) established interim effluent limitations for chlorodibromomethane and dichlorobromomethane, which will be effective until 1 July 2018, prior to the expiration of this Order.

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

(a) 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.

(b) 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.

(c) 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 (approximately 1.4 miles upstream and 8.4 miles downstream of the discharge) relative to the large size of the receiving water (the San Joaquin River is 330 miles long and approximately 250 feet wide at the point of discharge), is not at or near a drinking water intake, and does not overlap a mixing zone from a different outfall.

(d) The Central Valley Water Board is allowing mixing zones for human carcinogens and has determined allowing such mixing zones will not cause acutely toxic conditions to aquatic life passing through the mixing zones, because bromoform, chlorodibromomethane, and dichlorobromomethane are not toxic to aquatic life.

(e) 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, because the mixing zones are for human

carcinogen and acute aquatic toxicity criteria are relatively small, and acutely toxic conditions will not occur in the mixing zones. 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 Order establishes end-of-pipe effluent limitations (e.g., for $CBOD_5$ and TSS) and discharge prohibitions to prevent these conditions from occurring.

(f) 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.

(g) The Central Valley Water Board has determined that the mixing zone complies with the SIP for priority pollutants.

(h) The mixing zone study indicates the maximum allowed dilution factor to be 13:1 for human health constituents. Section 1.4.2.2.B 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 these dilution factors are necessary for the Discharger to achieve compliance with this Order, except for bromoform, as described above.

(i) 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.

(j) 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 bromoform, chlorodibromomethane and dichlorobromomethane. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy and requires that existing quality of waters be maintained unless degradation is justified based on specific findings. Item 2 of Resolution 68-16 states:

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

The Central Valley Water Board determined the effluent limitations required by this Order will result in the Discharger implementing BPTC 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.

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.

e. **Hardness-Dependent CTR Metals Criteria.** The *California Toxics Rule* and the *National Toxics Rule* contain water quality criteria for seven metals that vary as a function of hardness. The lower the hardness the lower the water quality criteria. The metals with hardness-dependent criteria include cadmium, copper, chromium III, lead, nickel, silver, and zinc.

This Order has established the criteria for hardness-dependent metals based on the reasonable worst-case ambient hardness as required by the SIP[1], the CTR[2] and State Water Board Order No. WQO 2008-0008 (City of Davis). The SIP and the CTR require the use of "receiving water" or "actual ambient" hardness, respectively, to determine effluent limitations for these metals. (SIP, § 1.2; 40 CFR § 131.38(c)(4)) The CTR does not define whether the term "ambient," as applied in the regulations, necessarily requires the consideration of upstream as opposed to downstream hardness conditions. Therefore, where reliable, representative data are available, the hardness value for calculating criteria can be the downstream receiving water hardness, after mixing with the effluent (Order WQO 2008-0008, p. 11). The Central Valley Water Board thus has considerable discretion in determining ambient hardness (*Id.*, p.10).

As discussed below, scientific literature provides a reliable method for calculating protective hardness-dependent CTR criteria, considering all discharge conditions. This methodology produces hardness-dependent CTR criteria based on the reasonable worst-case downstream ambient hardness that ensure these metals do not cause receiving water toxicity under any downstream receiving water condition. Under this methodology, the Central Valley Water Board considers all hardness conditions that could occur in the ambient downstream receiving water after the effluent has mixed with the water body[3]. This ensures that effluent limitations are fully protective of aquatic life in all areas of the receiving water affected by the discharge under all flow conditions, at the fully mixed location, and throughout the water body including at the point of discharge into the water body.

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[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. It further requires that the hardness values used must be consistent with the design discharge conditions for design flows and mixing zones.

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

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

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

b) The SIP requires WQBELs if the receiving water is impaired upstream (outside the influence) of the discharge, i.e., if the Maximum Ambient Background Concentration of a pollutant exceeds the applicable criterion, adjusted for hardness[1]. For comparing the Maximum Ambient Background Concentration to the applicable criterion, the reasonable worst-case upstream ambient hardness was used to adjust the criteria. This is appropriate, because this area is outside the influence of the discharge. Since the discharge does not impact the upstream hardness, the effect of the effluent hardness was not included in this evaluation.

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

A 2006 Study[2] developed procedures for calculating the effluent concentration allowance (ECA)[3] for CTR hardness-dependent metals. The 2006 Study demonstrated that it is necessary to evaluate all discharge conditions (e.g. high

[1] The pollutant must also be detected in the effluent.
[2] Emerick, R.W.; Borroum, Y.; & Pedri, J.E., 2006. California and National Toxics Rule Implementation and Development of Protective Hardness Based Metal Effluent Limitations. WEFTEC, Chicago, Ill.
[3] The ECA is defined in Appendix 1 of the SIP (page Appendix 1-2). The ECA is used to calculate WQBELs in accordance with Section 1.4 of the SIP.

and low flow conditions) and the hardness and metals concentrations of the effluent and receiving water when determining the appropriate ECA for these hardness-dependent metals. This method is superior to relying on downstream receiving water samples alone because it captures all possible mixed conditions in the receiving water. Both receiving water and effluent hardness vary based on flow and other factors, but the variability of receiving water and effluent hardness is sometimes independent. Using a calculated hardness value ensures that the Central Valley Water Board considers all possible mixed downstream values that may result from these two independent variables. Relying on receiving water sampling alone is less likely to capture all possible mixed downstream conditions.

The equation describing the total recoverable regulatory criterion, as established in the CTR[1], is as follows:

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

Where:

H = hardness (as $CaCO_3$)[2]
WER = water-effect ratio
m, b = metal- and criterion-specific constants

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

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

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

Where:

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

B = the ambient background concentration

The 2006 Study demonstrated that the relationship between hardness and the calculated criteria is the same for some metals, so the same procedure for calculating the ECA may be used for these metals. The same procedure can be used for ~~chronic~~ cadmium (chronic), chromium III, copper, nickel, and zinc. These metals are hereinafter referred to as "Concave Down Metals". "Concave Down" refers to the shape of the curve represented by the relationship between hardness and the CTR criteria in Equation 1. Another similar procedure can be

[1] 40 CFR § 131.38(b)(2).
[2] For this discussion, all hardness values are in mg/L as $CaCO_3$.
[3] The 2006 Study assumes the ambient background metals concentration is equal to the CTR criterion (i.e. $C \leq B$)

used for determining the ECA for ~~acute~~ cadmium (acute), lead, and acute silver, which are referred to hereafter as "Concave Up Metals".

ECA for ~~Chronic~~ Cadmium (Chronic), Chromium III, Copper, Nickel, and Zinc – For Concave Down Metals (i.e., ~~chronic~~ cadmium (chronic), chromium III, copper, nickel, and zinc) the 2006 Study demonstrates that when the effluent is in compliance with the CTR criteria and the upstream receiving water is in compliance with the CTR criteria, any mixture of the effluent and receiving water will always be in compliance with the CTR criteria[1]. The 2006 Study proves that regardless of whether the effluent hardness is lower or greater than the upstream hardness, the reasonable worst-case flow condition is the effluent dominated condition (i.e., no receiving water flow)[2]. Consequently, for Concave Down Metals, the CTR criteria have been calculated using the downstream ambient hardness under this condition.

The effluent hardness ranged from 106 mg/L to 192 mg/L, based on 48 samples from January 2009 to December 2012. The upstream receiving water hardness varied from 36 mg/L to 210 mg/L, based on 60 samples from January 2009 to December 2012, and the downstream receiving water hardness varied from 30 mg/L to 200 mg/L, during the same period. Under the effluent dominated condition, the reasonable worst-case downstream ambient hardness is 106 mg/L. As demonstrated in the example shown in **Table F-9**, below, using this hardness to calculate the ECA for all Concave Down Metals will result in WQBELs that are protective under all flow conditions, from the effluent dominated condition to high flow condition. This example for copper assumes the following conservative conditions for the upstream receiving water:

- Upstream receiving water always at the lowest observed upstream receiving water hardness (i.e., ~~30~~ 36 mg/L)
- Upstream receiving water copper concentration always at the CTR criteria (i.e., no assimilative capacity).

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

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

Where:

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

[1] 2006 Study, p. 5700

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

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

Table F-9. Copper ECA Evaluation

Lowest Observed Effluent Hardness					**106 mg/L (as $CaCO_3$)**
Lowest Observed Upstream Receiving Water Hardness					**36 mg/L (as $CaCO_3$)**
Highest Assumed Upstream Receiving Water Copper Concentration					**3.9 µg/L[1]**
Copper $ECA_{chronic}$[2]					**9.8 µg/L**
Effluent Fraction[6]		**Fully Mixed Downstream Ambient Concentration**			
		Hardness[3] (mg/L)	**CTR Criteria[4] (µg/L)**	**Copper[5] (µg/L)**	**Complies with CTR Criteria**
High Flow	1%	30.76	3.4	3.4	**Yes**
	5%	33.8	3.7	3.7	**Yes**
	15%	41.4	4.4	4.3	**Yes**
	25%	49	5.1	5.0	**Yes**
	50%	68	6.7	6.6	**Yes**
Low Flow	75%	87	8.3	8.2	**Yes**
	100%	106	9.8	9.8	**Yes**

1 Highest assumed upstream receiving water copper concentration calculated using Equation 1 for chronic criterion at a hardness of **36 mg/L**.

2 ECA calculated using Equation 1 for chronic criterion at a hardness of **106 mg/L**.

3 Fully mixed downstream ambient hardness is the mixture of the receiving water and effluent hardness at the applicable effluent fraction using Equation 3.

4 Fully mixed downstream ambient criteria are the chronic criteria calculated using Equation 1 at the mixed hardness.

5 Fully mixed downstream ambient copper concentration is the mixture of the receiving water and effluent copper concentrations at the applicable effluent fraction using Equation 3.

6 The effluent fraction ranges from 1% at the high receiving water flow condition, to 100% at the lowest receiving water flow condition (i.e., effluent dominated).

ECA for ~~Acute~~ Cadmium (Acute), Lead, and Acute Silver – For Concave Up Metals (i.e., ~~acute~~ cadmium (acute), lead, and acute silver), the relationship between hardness and the metals criteria is different than for Concave Down Metals. The 2006 Study demonstrates that for Concave Up Metals, the effluent and upstream receiving water can be in compliance with the CTR criteria, but the resulting mixture may contain metals concentrations that exceed the CTR criteria and could cause toxicity. For these metals, the 2006 Study provides a mathematical approach to calculate the ECA that is protective of aquatic life, in all areas of the receiving water affected by the discharge, under all discharge and receiving water flow conditions (see Equation 4, below).

[1] This method considers the actual lowest observed upstream hardness and actual lowest observed effluent hardness to determine the reasonable worst-case ambient downstream hardness under all possible receiving water flow conditions. Table F-~~8~~ 9 demonstrates that the receiving water is always in compliance with the CTR criteria at the fully-mixed location in the receiving water. It also demonstrates that the receiving water is in compliance with the CTR criteria for all mixtures from the point of discharge to the fully-mixed location. Therefore, a mixing zone is not used for compliance.

The ECA, as calculated using Equation 4, is based on the reasonable worst-case upstream receiving water hardness, the lowest observed effluent hardness, and assuming no receiving water assimilative capacity for metals (i.e., ambient background metals concentrations are at their respective CTR criterion). Equation 4 is not used in place of the CTR equation (Equation 1). Rather, Equation 4, which is derived using the CTR equation, is used as a direct approach for calculating the ECA. This replaces an iterative approach for calculating the ECA. The CTR equation has been used to evaluate the receiving water downstream of the discharge at all discharge and flow conditions to ensure the ECA is protective (e.g., see **Table F-510**).

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

vvnere:

m, b = criterion specific constants (from CTR)

H_e = lowest observed effluent hardness

H_{rw} = reasonable worst-case upstream receiving water hardness

An example similar to the Concave Down Metals is shown for lead, a Concave Up Metal, in **Table F-10**, below. As previously mentioned, the lowest effluent hardness is 106 mg/L, while the upstream receiving water hardness ranged from 36 mg/L to 210 mg/L, and the downstream receiving water hardness ranged from 30 mg/L to 200 mg/L. In this case, the reasonable worst-case upstream receiving water hardness to use in Equation 4 to calculate the ECA is 36 mg/L.

Using the procedures discussed above to calculate the ECA for all Concave Up Metals will result in WQBELs that are protective under all potential effluent/receiving water flow conditions (high flow to low flow) and under all known hardness conditions, as demonstrated in **Table F-10**, for lead.

Table F-10. Lead ECA Evaluation

Lowest Observed Effluent Hardness	**106 mg/L**
Reasonable Worst-case Upstream Receiving Water Hardness	**36 mg/L**
Reasonable Worst-case Upstream Receiving Water Lead Concentration	**0.87 µg/L[1]**
Lead $ECA_{chronic}$[2]	**3.01 µg/L**

Effluent Fraction[6]		Fully Mixed Downstream Ambient Concentration			
		Hardness[3] (mg/L) (as $CaCO_3$)	CTR Criteria[4] (µg/L)	Lead[5] (µg/L)	Complies with CTR Criteria
High Flow	1%	36.5	0.9	0.9	**Yes**
	5%	38.3	0.9	0.9	**Yes**
	15%	42.9	1.1	1.1	**Yes**
	25%	47.5	1.2	1.2	**Yes**
	50%	59.0	1.6	1.6	**Yes**
	75%	70.5	2.0	1.9	**Yes**
Low Flow	100%	82.0	2.5	2.3	**Yes**

[1] Reasonable worst-case upstream receiving water lead concentration calculated using Equation 1 for chronic criterion at a hardness of **36 mg/L**.

[2] ECA calculated using Equation 4 for chronic criteria.

[3] Fully mixed downstream ambient hardness is the mixture of the receiving water and effluent hardness at the applicable effluent fraction.

[4] Fully mixed downstream ambient criteria are the chronic criteria calculated using Equation 1 at the mixed hardness.

[5] Fully mixed downstream ambient lead concentration is the mixture of the receiving water and effluent lead concentrations at the applicable effluent fraction.

[6] The effluent fraction ranges from 1% at the high receiving water flow condition, to 100% at the lowest receiving water flow condition (i.e., effluent dominated).

Based on the procedures discussed above, **Table F-11** lists all the CTR hardness-dependent metals and the associated ECA used in this Order.

Table F-11. Summary of ECA Evaluations for CTR Hardness-dependent Metals

CTR Metals	ECA (µg/L, total recoverable)[1]	
	acute	chronic
Copper	15	9.8
Chromium III	1800	220
Cadmium	4.6	2.6
Lead	77	3.0
Nickel	490	55
Silver	2.2	-
Zinc	130	130

[1] Metal criteria rounded to two significant figures in accordance with the CTR.

3. **Determining the Need for WQBELs**

a. **Constituents with Total Maximum Daily Limitation (TMDL).** The Central Valley Water Board developed WQBELs for chlorpyrifos, diazinon and mercury that have available wasteload allocations under Total Maximum Daily Loads (TMDLs). The effluent limitations for these pollutants were established regardless of whether or not there is reasonable potential for the pollutants to be present in the discharge at levels that would cause or contribute to a violation of water quality standards. The Central Valley Water Board developed water quality-based effluent limitations for these pollutants pursuant to 40 C.F.R. section 122.44(d)(1)(vii), which does not require or contemplate a reasonable potential analysis. Similarly, the SIP at Section 1.3 recognizes that reasonable potential analysis is not appropriate if a TMDL has been developed.

This Order contains WQBELs for chlorpyrifos, diazinon and mercury. As required by 40 C.F.R. section 122.44(d)(1)(vii), the Central Valley Water Board shall ensure there are WQBELs for chlorpyrifos, diazinon and mercury in the WDR's that is consistent with the assumptions and requirements of the available wasteload allocation. Based on the water quality monitoring done at the time of the TMDL adoption, which set the wasteload allocation at the level necessary to attain water quality standards, the Central Valley Water Board has determined that the WQBEL is consistent with the assumptions of the TMDL. Similarly, compliance with the effluent limitation will satisfy the requirements of the TMDL.

b. **Constituents with No Reasonable Potential.** WQBELs 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**

(a) **WQO.** 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. Freshwater aquatic life criteria for metals are expressed as a function of total hardness. However, aluminum criteria were not promulgated as part of the CTR. Absent numeric aquatic life criteria for aluminum, WQBEL's in the Central Valley Water Board's NPDES permits are based on the Basin Plan's narrative toxicity objective.

The Basin Plan's *Policy for Application of Water Quality Objectives* requires the Central Valley Water Board to consider, "*on a case-by-case basis, direct evidence of beneficial use impacts, all material and relevant information submitted by the discharger and other interested parties, and relevant numerical criteria and guidelines developed and/or published by other*

agencies and organizations. In considering such criteria, the Board evaluates whether the specific numerical criteria which are available through these sources and through other information supplied to the Board, are relevant and appropriate to the situation at hand and, therefore, should be used in determining compliance with the narrative objective." Relevant information includes, but is not limited to the following: (1) USEPA Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses, (2) USEPA National Recommended Ambient Water Quality Criteria (NAWQC), (3) NAWQC–Correction, and (4) 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).)

For aluminum, this Order implements the Basin Plan's narrative toxicity objective and the narrative chemical constituents objective for protection of the aquatic life and domestic and municipal supply beneficial uses. USEPA developed National Recommended Ambient Water Quality Criteria (NAWQC) for protection of freshwater aquatic life for aluminum (1988). The recommended 4-day average (chronic) and 1-hour average (acute) criteria for aluminum are 87 µg/L and 750 µg/L, respectively, for waters with a pH of 6.5 to 9.0. The NAWQC can be used to implement the Basin Plan's narrative toxicity objective. In addition, the Secondary Maximum Contaminant Level (MCL) - Consumer Acceptance Limit for aluminum is 200 µg/L, which implements the Basin Plan's narrative chemical constituents objective. ~~Order R5-2007-0039 included effluent limitations for aluminum based on the NAWQC chronic criteria.~~

In April 1999, USEPA released the National Recommended Water Quality Criteria–Correction. There were no corrections to the 1988 aluminum recommended criteria; however, USEPA recognized that they were aware of field data indicating that many high quality waters in the U.S. contain more than 87 µg/L aluminum, when either total recoverable or dissolved is measured (i.e., the higher levels of aluminum did not affect beneficial uses). Therefore, Footnote L to the National Recommended Ambient Water Quality Criteria summary table for aluminum indicated a water effects ratio (WER) might be appropriate for implementation of its recommended chronic criterion for aluminum to protect aquatic organisms. (*National Recommended Water Quality Criteria–Correction (April 1999)*.)

Although striped bass may be present in the receiving water in the vicinity of the discharge, monitoring data demonstrates that the study conditions are not similar to those in the San Joaquin River, which consistently has a higher upstream hardness, ranging from 36 to 210 mg/L and higher pH, ranging from 6.6 to 9.2 standard units. Because the hardness in the San Joaquin River is higher (which decreases the toxic effects to aquatic life) than the water hardness values in which the criterion was developed, USEPA advises that a WER might be appropriate to better reflect the actual toxicity of aluminum to aquatic organisms.

In April 2005, the City of Modesto, which discharges to the San Joaquin River upstream of Stockton, completed a Phase I WER for aluminum, and on 11 November 2005, submitted the results in its *Aluminum Water-Effect Ratio Study Plan*. The Phase I WER study consisted of range-finding toxicity tests,

in which the NOEC, LOEC, and EC_{50}[1] were determined for the species *Daphnia magna, Ceriodaphnia dubia, and Rainbow Trout.* For this initial range-finding test, side-by-side testing with laboratory water was not conducted. However, to obtain an estimate of the potential WER for the Modesto WWTP effluent, the EC_{50} values determined for the site water were divided by the Species Mean Acute Value (SMAV) available in the aluminum criteria document according to EPA's streamlined WER procedure.[2] According to the EPA streamlined procedure, two WERs are determined by dividing site water WERs with both the laboratory dilution water EC_{50} and the SMAV; the final WER of the sample is the lesser of the two. The estimated WERs calculated using the SMAVs are presented in the table below:

Species	Site Water EC_{50} for Total Al (µg/L)	SMAV (µg/L Al)	WER
Daphnia magna	31,604	38.2	827
Ceriodaphnia dubia	>11,900[1]	1.9	6,263
Rainbow trout	>34,250[1]	10.39	3,296

[1] The 2001 EPA streamlined procedures state that a "greater than" value for the EC_{50} in the site water is interpreted as "equal to" in calculating the WER.

The Modesto Phase I WER study is not sufficient to calculate a WER, however, the preliminary results confirm the conditions of San Joaquin River are not similar to the EPA study conditions for the development of the USEPA recommended chronic criterion. The chronic criterion is overly stringent and is not appropriate to use to interpret the Basin Plan's narrative toxicity objective.

In addition, on 12 April 2007, the City of Manteca completed a Phase II aluminum WER study for the San Joaquin River near its discharge point, which is downstream of the City of Modesto and upstream of Stockton. The Manteca Phase II WER study, which may be used to calculate a WER for the City of Manteca's discharge, indicated that a WER of 22.7 can be applied to the chronic criterion for aluminum (resulting in a chronic criterion of 22.7 x 87 µg/L = 1,975 µg/L).

In addition, monitoring data demonstrates San Joaquin River hardness, in the vicinity of the City of Stockton's Facility discharge, concentrations ranging from 36 mg/L to 210 mg/L and pH ranging from 6.6 to 9.2 standard units, both similar to conditions in the San Joaquin River where the Modesto and Manteca aluminum studies were conducted, are higher than conditions in which the NAWQC chronic criteria were developed. Thus, it is unlikely that application of the chronic criterion of 87 µg/L is necessary to protect aquatic life in the San Joaquin River near the Facility's discharge. Since the characteristics of the San Joaquin River (e.g., hardness and pH) near Manteca and Modesto are similar to those near the Facility, the results of the

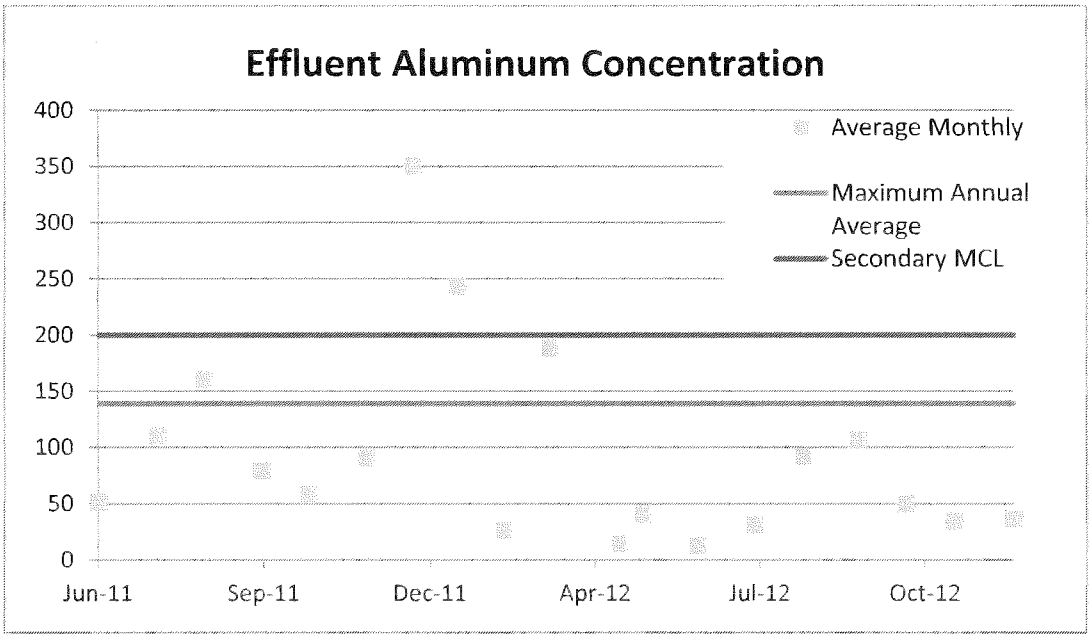
[1] The NOEC is the "no observed effect concentration", the LOEC is the "lowest observed effect concentration", and the EC_{50} is the concentration that caused an effect to 50% of the test organisms. See Attachment A for more detailed definitions.

[2] USEPA. 2001. Streamlined Water-Effect Ratio Procedure for Discharges of Copper. Office of Water. EPA-822-R-01-005. March.

Manteca WER and Modesto studies indicates that the chronic criterion recommended by the NAWQC for aluminum is overly stringent for the San Joaquin River.

Based on professional judgment considering the site-specific conditions of the receiving water (e.g., hardness and pH), the Modesto Phase I WER Study, and the Manteca Phase II WER Study, the Central Valley Water Board finds that the NAWQC chronic criterion for aluminum is overly stringent and should not be used to interpret the narrative toxicity objective for this discharge. Therefore, the DPH Secondary MCL (200 µg/L annual average) for aluminum was used to conduct the reasonable potential analysis for aluminum.

(b) **RPA Results.** The Facility discontinued the use of alum as a coagulant in May 2011. Therefore, effluent data collected between June 2011 and December 2012 was used to conduct the RPA for aluminum. The maximum observed effluent concentration for aluminum was 350 µg/L, maximum average monthly was 350 µg/L, and maximum annual average was 139 µg/L. A pond turn-over event occurred in September 2011 that suspended material for approximately 4 months, which resulted in elevated aluminum samples in December 2011, as shown below. Additionally, aluminum was detected in the receiving water with a maximum observed concentration of 2,000 µg/L based on 12 samples collected between January 2011 and December 2011.



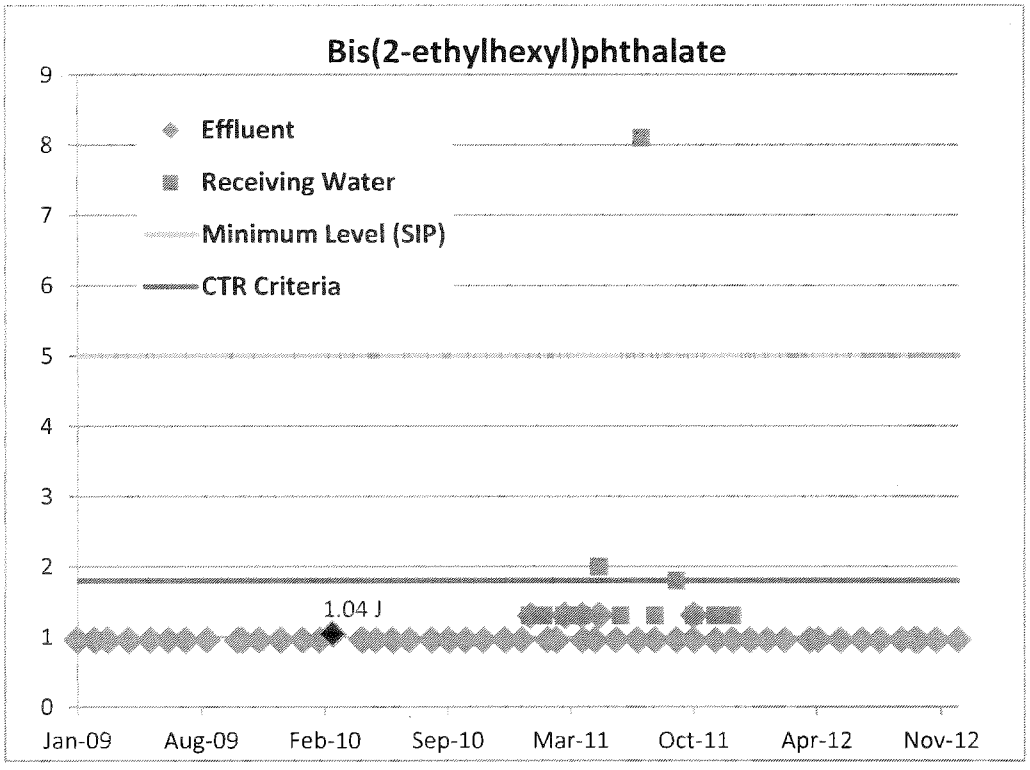
For priority pollutants, the SIP dictates the procedures for conducting the RPA. Aluminum is not a priority pollutant. Therefore, the Central Valley Water Board is not restricted to one particular RPA method. Due to the site-specific conditions in the discharge, the Central Valley Water Board has used professional judgment in determining the appropriate method for this non-priority pollutant constituent.

The most stringent objective is the Secondary Drinking Water MCL, which is derived from human welfare considerations (e.g., taste, odor, laundry staining), not for toxicity to humans or aquatic life. Although the receiving water contains aluminum exceeding the Secondary MCL, the receiving water is not listed on the 303(d) list for aluminum, and aluminum is not a constituent of concern in the development of the Drinking Water Policy. Additionally, the effluent aluminum is consistently less than the concentrations in the receiving water and below the Secondary MCL. Therefore, the Central Valley Water Board finds the discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion and the Facility is adequately controlling the discharge of aluminum. The WQBELs for aluminum have not been retained in this Order. Removal of these effluent limitations is in accordance with federal anti-backsliding regulations (see section IV.D.3 of the Fact Sheet).

ii. **Bis(2-ethylhexyl)phthalate**

(a) **WQO.** The CTR criterion for the protection of human health for waters from which both water and organisms are consumed is 1.8 µg/L for bis (2-ethylhexyl) phthalate.

(b) **RPA Results.** Bis (2-ethylhexyl) phthalate was detected once out of 17 effluent samples at a concentration of 1.04 µg/L. Bis (2-ethylhexyl) phthalate was detected in the upstream receiving water 3 times out of 12 samples at concentrations of 1.8, 2.0 and 8.1 µg/L.



SIP Appendix 4 cites two Minimum Levels (ML) for bis (2-ethylhexyl) phthalate. The lowest applicable ML cited for

bis (2-ethylhexyl) phthalate is 5 µg/L. The Discharger used an analytical method that was more sensitive, which resulted in a reporting level of 1.5 µg/L, than the minimum level required by the SIP. The single detected effluent result of 1.04 µg/L was an estimated value (i.e., DNQ). Therefore, there is no reasonable potential for bis (2-ethylhexyl) phthalate to exceed the CTR criteria.

Removal of these effluent limitations is in accordance with federal antibacksliding regulations (see section IV.D.3 of the Fact Sheet).

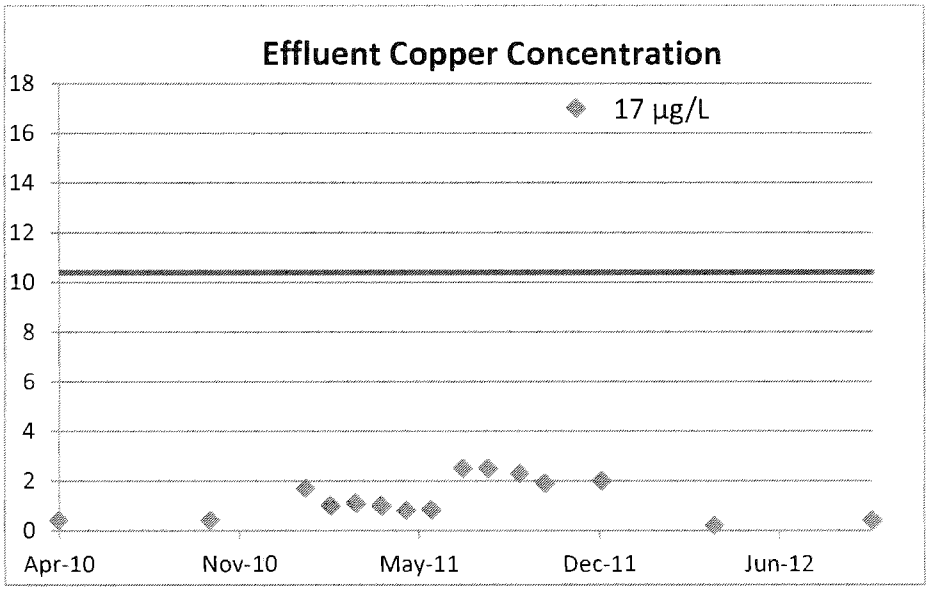
iii. **Copper, Total Recoverable**

(a) **WQO.** The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for copper. These criteria for copper are presented in dissolved concentrations, as 1-hour acute criteria and 4-day chronic criteria. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. Default USEPA translators (i.e., 0.96 for acute and chronic criteria) were used for the receiving water and effluent.

The Basin Plan (BP) includes a site-specific objective for the Sacramento-San Joaquin Delta of 10 µg/L (dissolved) as a maximum concentration. Using the default USEPA translator, the BP objective is 10.4 µg/L (total recoverable).

Footnote 4, page 3, of the Introduction of the SIP states, *"If a water quality objective and a CTR criterion are in effect for the same priority pollutant, the more stringent of the two applies."* The BP objective cannot be directly compared to the CTR criteria to determine which is the most stringent objective because they have different averaging periods and the CTR criteria vary with hardness. In this situation, the RPA has been conducted considering both the CTR criteria and the BP water quality objectives.

(b) **RPA Results.** The maximum effluent concentration (MEC) for copper was 17 µg/L based on 17 samples collected from April 2010 through October 2012. The maximum copper receiving water concentration was 3.4 µg/L based on 12 samples collected during 2011. The MEC, which occurred on 16 November 2011, is not representative of copper in the Facility's discharge (see graph below).



The Facility underwent a pond turn-over event that began in September 2011 where bottom sludge remained suspended for approximately 4 months. In addition, a miscalculation of the recirculation pump capacity resulted in over pumping in the ponds that may have exacerbated the problem. Pond sludge is a sink for metals at the Facility, and the much higher than normal pumping rates in the recirculation ditch is believed to have been the cause for the prolonged suspension. In response to this event, the City has updated its operations protocols so as to prevent a similar phenomenon occurring in the future. Because pond turn-over coinciding with sludge re-suspension and abnormally high recirculation ditch pumping rates is unrepresentative of normal operations, the single high total recoverable copper value is unrepresentative of copper in the Facility's discharge. Excluding the one unrepresentative copper sample, there is no reasonable potential for copper to exceed the criteria.

iv. **Cyanide**

(a) **WQO.** The CTR includes maximum 1-hour average and 4-day average cyanide concentrations of 22 µg/L and 5.2 µg/L, respectively, for the protection of freshwater aquatic life.

(b) **RPA Results.** Based on 16 samples collected from January 2012 through December 2012, the MEC for cyanide was 4.8 µg/L and the maximum average monthly effluent concentration for cyanide was 4.2 µg/L. All 12 receiving water samples collected for cyanide were not detected (MDL = 2 µg/L). The reasonable potential analysis for cyanide was conducted using only data collected after January 2012 due to the use of sodium hydroxide as a preservative and the associated potential for analytical error. The Discharger obtained a sample preservation variance from USEPA and has been collecting unpreserved cyanide samples consistent with the variance since January 2012.

The WQBELs for cyanide have not been retained in this Order. Removal of

these effluent limitations is in accordance with federal anti-backsliding regulations (see section IV.D.3 of the Fact Sheet).

v. **Dissolved Oxygen**

(a) **WQO.** The Basin Plan contains a numeric site-specific water quality objective for the Sacramento-San Joaquin Delta waterways, in the vicinity of the discharge, that requires that dissolved oxygen concentrations shall not be reduced below 6.0 mg/L from 1 September through 30 November and 5.0 mg/L throughout the remainder of the year. ~~Order R5-2008-0154 included a minimum daily average effluent limitation for dissolved oxygen of 6.0 mg/L from 1 September through 30 November and 5.0 mg/L throughout the remainder of the year.~~

(b) **RPA Results.** The Discharger reported 1431 average daily effluent results for dissolved oxygen from January 2009 through December 2012, of which all samples were above the water quality objective of 5.0 mg/L and 6.0 mg/L. Since Order R5-2008-0154 was adopted, tertiary treatment was installed which includes a nitrifying biotower for ammonia removal and dissolved air floatation units where removal efficiencies are enhanced through chemical addition. Since these upgrades, oxygen-demanding substances have been reduced in the Facility's discharge. The discharge does not demonstrate reasonable potential to cause or contribute to an in-stream excursion below the Basin Plan's objective of 5.0 mg/L and 6.0 mg/L, ~~and WQBELS for dissolved oxygen have not been retained in this Order. This Order does, however, retain receiving water limitations for dissolved oxygen. Removal of the effluent limitations is in accordance with federal anti-backsliding regulations (see section IV.D.3 of the Fact Sheet).~~

(c) **WQBELs.** Resolution R5-2005-0005 was adopted by the Central Valley Water Board on 27 January 2005, and approved by the USEPA on 7 February 2007, establishing the Control Program for Factors Contributing to the Dissolved Oxygen Impairment in the Stockton Deep Water Ship Channel Portion of the San Joaquin River, and is applicable to the Facility's discharge. Order R5-2008-0154 included a minimum daily average effluent limitation for dissolved oxygen of 6.0 mg/L from 1 September through 30 November and 5.0 mg/L throughout the remainder of the year due to the discharge exhibiting reasonable potential to cause or contribute to an exceedance of the DO water quality objectives. Although the Facility improvements have reduced the discharge of oxygen demanding substances substantially and have resulted in increased DO in the Deep Water Ship Channel, the river, at times, continues to exceed the water quality objectives. Therefore, in accordance with the Control Program this Order does not relax the DO effluent limitations. The DO effluent limitations from the previous Order have been carried forward.

~~(b)~~(d) **Plant Performance and Attainability.** The Central Valley Water Board concludes that immediate compliance with the limitations for DO is feasible.

vi. **Manganese**

(a) **WQO.** The Basin Plan contains a site-specific numeric objective for the Delta of 50 µg/L (maximum concentration) for manganese, expressed as dissolved metal. The Secondary MCL for manganese is 50 µg/L, expressed as total recoverable.

(b) **RPA Results.** The maximum observed effluent concentration for manganese was 32 µg/L and the maximum calendar annual average effluent concentration for manganese was 13 µg/L. The maximum observed manganese concentration in the receiving water was 100 µg/L.

For priority pollutants, the SIP dictates the procedures for conducting the RPA. However, since manganese is not a priority pollutant, 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.

The most stringent objective is the Secondary Drinking Water MCL, which is derived from human welfare considerations (e.g., taste, odor, laundry staining) not for toxicity to humans or aquatic life. Although the receiving water contains manganese exceeding the Secondary MCL, the receiving water is not listed on the 303(d) list for manganese, and manganese is not a constituent of concern in the Drinking Water Policy. Additionally, the effluent manganese is consistently less than the concentrations in the receiving water and below the applicable water quality objective. Therefore, the Central Valley Water Board finds the discharge does not have reasonable potential to cause or contribute to an exceedance in the receiving water and the Facility is adequately controlling the discharge of manganese. The WQBELs for manganese have not been retained in this Order. Removal of these effluent limitations is in accordance with federal anti-backsliding regulations (see section IV.D.3 of the Fact Sheet).

vii. **Molybdenum**

(a) **WQO.** Molybdenum is a naturally occurring trace element, and one of 15 elements known to be essential to plant growth. While essential in trace concentrations, excess concentrations are known to bioaccumulate in certain plant species, causing molybdenosis in ruminants (especially cattle) grazing on forage containing concentrations above 10 parts per million (ppm). Studies indicate the impact of molybdenum contamination of forage depends on the quality and amount of irrigation water applied to the field, as well as on the type and leachability of the soil. *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985), recommends that the molybdenum concentration in waters used for agricultural irrigation not exceed 10 µg/L. Applying the Basin Plan "Policy for Application of Water Quality Objectives", the numeric standard that implements the narrative objective is the Agricultural Water Quality Goal of 10 µg/L.

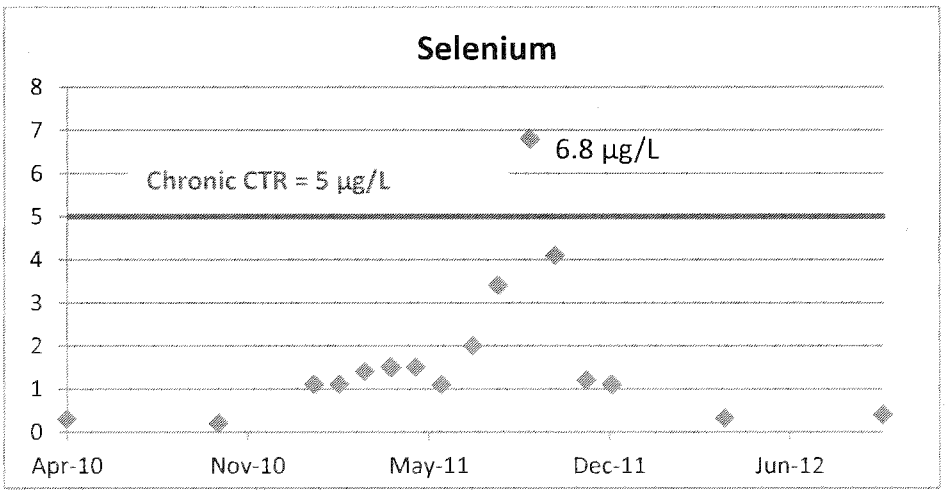
(b) **RPA Results.** The MEC for molybdenum was 7.7 µg/L based on 52 samples collected from January 2008 through December 2012. The WQBELs for

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

viii. **Selenium**

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

(b) **RPA Results.** The MEC for selenium was 6.8 µg/L based on 17 samples collected from April 2010 through October 2012. The maximum selenium receiving water concentration was 1.8 µg/L based on 12 samples collected during 2011. The MEC, which occurred on 14 September 2011, is not representative of selenium in the Facility's discharge (see graph below).



The Facility underwent a pond turn-over event that began in September 2011 where bottom sludge remained suspended for approximately 4 months. In addition, a miscalculation of the recirculation pump capacity resulted in over pumping in the ponds that may have exacerbated the problem. Pond sludge is a sink for metals at the Facility, and the much higher than normal pumping rates in the recirculation ditch is believed to have been the cause for the prolonged suspension. In response to this event, the City has updated its operations protocols so as to prevent a similar phenomenon occurring in the future. Because pond turn-over coinciding with sludge re-suspension and abnormally high recirculation ditch pumping rates is unrepresentative of normal operations, the single high total recoverable selenium value is unrepresentative of selenium in the Facility's discharge. Excluding the one unrepresentative selenium sample, there is no reasonable potential for selenium to exceed the criteria.

c. **Constituents with Limited 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. **Diazinon and Chlorpyrifos**

(a) **WQO.** The Central Valley Water Board completed a total maximum daily load (TMDL) for chlorpyrifos and diazinon in the San Joaquin River and amended the Basin Plan to include chlorpyrifos and diazinon waste load allocations and water quality objectives on 21 October 2005. The Basin Plan now contains water quality objectives for chlorpyrifos of 0.025 µg/L as a 1-hour average and 0.015 µg/L as a 4-day average and diazinon of 0.16 µg/L as a 1-hour average and 0.10 µg/L as a 4-day average for the San Joaquin River from Mendota Dam to Vernalis. The Basin Plan also states that "[c]*ompliance with the applicable water quality objectives, load allocations, and waste load allocations for diazinon and chlorpyrifos in the San Joaquin River Rivers is required by 1 December 2010*" and "[I]*n determining compliance with the waste load allocations, the Regional Water Board will consider any data or information submitted by the discharger regarding diazinon and chlorpyrifos inputs from sources outside of the jurisdiction of the permitted discharger, including in any diazinon and chlorpyrifos present in precipitation, and other available relevant information; and any applicable provisions in the discharger's NPDES permit requiring the discharger to reduce the discharge of pollutants to the maximum extent possible.*"

(b) **RPA Results.** All 12 effluent monitoring results for chlorpyrifos were below the reported method detection limit (0.017 µg/L). Similarly, all 12 effluent monitoring results for diazinon were below the reported method detection limit (0.01 µg/L). Since the reported method detection limits for chlorpyrifos ~~and diazinon are~~is above the chronic water quality objectives, the reasonable potential analysis for the tertiary treated effluent is inconclusive due to insufficient data.

(c) **WQBELs.** Regardless of the fact that an RPA cannot be conducted due to limited data, the TMDL for diazinon and chlorpyrifos for the SJR includes waste load allocations that must be implemented in this Order. Therefore, this Order includes effluent limits in accordance with the TMDL, which are as follows:

Effluent chlorpyrifos and diazinon concentrations shall not exceed the sum of one as defined below:

i. Average Monthly Effluent Limit

$$S_{AMEL} = \frac{C_{D\text{-}avg}}{0.08} + \frac{C_{C\text{-}avg}}{0.012} \leq 1.0$$

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

ii. Maximum Daily Effluent Limit

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

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

(d) **Plant Performance and Attainability.** Diazinon and chlorpyrifos has not been detected in the effluent and there is no expectation that it is in the discharge, because these pesticides have been banned. The Central Valley Water Board concludes that immediate compliance with these effluent limitations is feasible.

ii. **Salinity**

(a) **WQO.** The Basin Plan contains a chemical constituent objective that incorporates state MCLs, contains a narrative objective, and contains numeric water quality objectives for certain specified water bodies for electrical conductivity, total dissolved solids, sulfate, and chloride. The USEPA Ambient Water Quality Criteria for Chloride recommends acute and chronic criteria for the protection of aquatic life. There are no USEPA water quality criteria for the protection of aquatic life for electrical conductivity, total dissolved solids, and sulfate. Additionally, there are no USEPA numeric water quality criteria for the protection of agricultural, live stock, and industrial uses. Numeric values for the protection of these uses are typically based on site specific conditions and evaluations to determine the appropriate constituent threshold necessary to interpret the narrative chemical constituent Basin Plan objective. 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	Bay Delta Plan[1]	Secondary MCL[3]	USEPA NAWQC	Effluent	
				Average	Maximum
EC (µmhos/cm)	N/A	900, 1600, 2200	N/A	1016	1041[2]
TDS (mg/L)	N/A	500, 1000, 1500	N/A	604	720
Sulfate (mg/L)	N/A	250, 500, 600	N/A	77	130
Chloride (mg/L)	N/A	250, 500, 600	860 1-hr 230 4-day	160	180

[1] The Bay-Delta Plan includes water quality objectives at three locations in the South Delta for EC, which includes a 14-day running average EC of 700 µmhos/cm from 1 April – 31 Aug and a 14-day running average EC of 1000 µmhos/cm from 1 September - 31 March. Pursuant to Court Order, the Bay-Delta Plan south Delta objectives are not applicable to municipal dischargers until such time that the State Water Board revises the Bay-Delta Plan and properly considers application of the objectives to municipal dischargers.

[2] Maximum calendar annual average.

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

1) **Chloride.** The Secondary MCL for chloride is 250 mg/L, as a recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum. USEPA Ambient Water Quality Criteria for Chloride recommends acute (1-hour) and chronic (4-day) criteria for the protection of freshwater aquatic life of 860 mg/L and 230 mg/L, respectively.

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 Bay-Delta Plan includes water quality objectives for EC for the South Delta in the vicinity of the discharge[1]. On 1 June 2011, the Superior Court for Sacramento County entered a judgment and peremptory writ of mandate in the matter of *City of Tracy v. State Water Resources Control Board* (Case No; 34-2009-8000-392-CU-WM-GDS), ruling that the South Delta salinity objectives shall not apply to the City of Tracy and ***other municipal dischargers*** pending reconsideration of the South Delta salinity objectives and adoption of a proper program of implementation that includes municipal dischargers. The State Water Board is currently considering new salinity and flow objectives in the South Delta that will address the Court Order. Therefore, at the time this Order was adopted the South Delta salinity objectives are not applicable to the Discharger.

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.

(a) **RPA Results.**

[1] The Bay-Delta Plan includes water quality objectives at three locations in the South Delta for EC. The water quality objectives are a 14-day running average EC of 700 µmhos/cm from 1 April – 31 Aug and a 14-day running average EC of 1000 µmhos/cm from 1 September - 31 March. These objectives are not applicable to the City of Stockton's Facility at this time.

1) **Chloride.** Chloride concentrations in the effluent ranged from 150 mg/L to 180 mg/L, with an average of 160 mg/L. Background concentrations in the San Joaquin River ranged from 13 mg/L to 120 mg/L, with an average of 39 mg/L, for 12 samples collected by the Discharger from January 2011 through December 2011. These levels do not exceed the Secondary MCL or NAWQC.

2) **Electrical Conductivity.** A review of the Discharger's monitoring reports shows an average effluent EC of 1016 µmhos/cm, with a range from 827 µmhos/cm to 1182 µmhos/cm. The background receiving water EC averaged 483 µmhos/cm.

3) **Sulfate.** Sulfate concentrations in the effluent ranged from 41 mg/L to 130 mg/L, with an average of 77 mg/L. Background concentrations in the San Joaquin River ranged from 14 mg/L to 100 mg/L, with an average of 37 mg/L. These levels do not exceed the Secondary MCL. The Discharge does not have reasonable potential for sulfate.

4) **Total Dissolved Solids.** The average TDS effluent concentration was 604 mg/L with concentrations ranging from 500 mg/L to 720 mg/L. These levels do not exceed the Secondary MCL. The background receiving water TDS ranged from 73 mg/L to 590 mg/L, with an average of 279 mg/L.

(b) **WQBELs.** The State Water Board is currently revising the Bay-Delta Plan, and its revision includes consideration of application of the salinity objectives to municipal discharges. Until the Bay-Delta Plan is revised, the Central Valley Water Board is unable to conduct a reasonable potential analysis for salinity for this discharge.

Pending the Bay-Delta Plan amendment, this Order establishes a performance-based annual average effluent limit for electrical conductivity of 1300 µmhos/cm. This Order includes an annual average effluent limitation for electrical conductivity and requires the Discharger to implement measures to reduce the salinity in its discharge to the San Joaquin River. The established effluent limit is based on current treatment plant performance and will ensure that the mass loading of salinity does not increase.

This Order also requires the Discharger to continue to implement a pollution prevention plan for salinity in accordance with Water Code section 13263.3(d)(3), and requires the Discharger to report on progress in reducing salinity discharges to the San Joaquin River.

(c) **Plant Performance and Attainability.** Based on existing Facility performance it appears the Discharger can immediately comply with the electrical conductivity effluent limits.

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, bromoform, chlorine, mercury, nitrate plus nitrite, pH, chlorodibromomethane, dichlorobromomethane, pathogens, and temperature. WQBELs for these constituents are included in this

Order. A summary of the RPA is provided in Attachment G, and a detailed discussion of the RPA for each constituent is provided below.

i. **Ammonia**

(a) **WQO.** In August 2013, U.S. EPA updated its National Ambient Water Quality Criteria (NAWQC) for the protection of freshwater aquatic life for total ammonia[1]. The 2013 NAWQC for ammonia recommends acute (1-hour average; criteria maximum concentration or CMC) and chronic (30-day average; criteria continuous concentration or CCC) standards that vary based on pH and temperature. U.S. EPA also recommends that no 4-day average concentration should exceed 2.5 times the 30-day CCC. The 2013 NAWQC for ammonia takes into account data for several sensitive freshwater mussel species and non-pulmonate snails that had not previously been tested.

U.S. EPA found that as pH and temperature increased, both the acute and chronic toxicity of ammonia increased for invertebrates. However, U.S. EPA found that only pH significantly influenced acute and chronic ammonia toxicity for fish. Therefore, the 2013 acute NAWQC for ammonia is primarily based on the ammonia effects on species in the genus *Oncorhyncus* (salmonids) at lower temperatures and invertebrates at higher temperatures. However, due to the significant sensitivity unionid mussels have to the chronic toxicity effects of ammonia, the 2013 chronic NAWQC for ammonia is determined primarily by the effects of mussels.

The 2013 ammonia NAWQC document states that "*unionid mussel species are not prevalent in some waters, such as the arid west.*" The 2013 ammonia NAWQC also states 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 2013 ammonia NAWQC document, therefore, includes a recalculation procedure for acute and chronic criteria for waters where mussels are not present. The 2013 ammonia NAWQC also provides criteria for waters where *Oncorhynchus* species are not present and where protection of early life stages of fish genera is unnecessary.

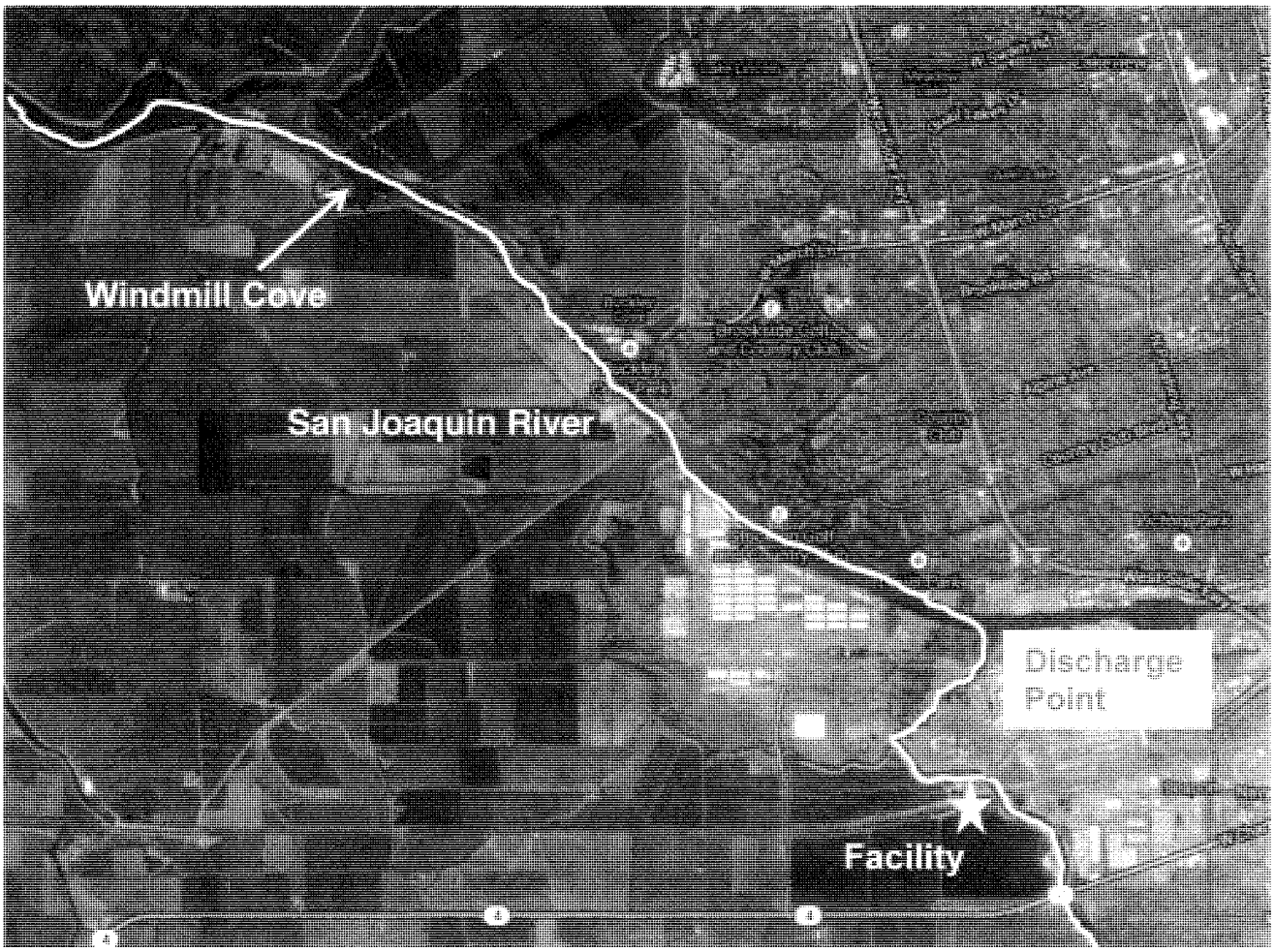
A report prepared by The Nature Conservancy, *Sensitive Freshwater Mussel Surveys in the Pacific Southwest Region: Assessment of Conservation Status*, demonstrates the results of a strategic mussel study and survey conducted during 2008-2009. Results from the study around the locality of the Facility's discharge are summarized in the table below. The study indicates three surveyed mussels were historically present in the San Joaquin River, with the nearest location downstream of Windmill Cove, which is located approximately 3 miles from the Facility's discharge location (see Figure below). Anodonta and Gonidea are in the family Unionidae. Based on the historical and recent presence of mussels in the family Unionidae at the San Joaquin River locations identified below, the site-specific ammonia criteria for waters where mussels are present were used. San Joaquin River

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

has a beneficial use of cold freshwater habitat (COLD) and the presence of salmonids and early fish life stages in the San Joaquin River is well-documented, therefore, the recommended ammonia criteria for waters where salmonids and early life stages are present were used.

Water Body	Locality	Mussels Found Historically	Mussels Found in 2008-2009 Survey
San Joaquin River	14 miles N.E. of Fresno, CA	Anodonta	N/A
San Joaquin River	Antioch, CA	Anodonta	N/A
San Joaquin River	Stevenson, CA	Anodonta	N/A
San Joaquin River	Downstream of Windmill Cove	Anodonta Gonidea Margaritifera	Anodonta
San Joaquin River	Upper San Joaquin River	Gonidea	N/A

N/A Either not surveyed or not known if currently present.



(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 WQBELs are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBELs for pathogens in all permits for POTWs discharging to contact recreational waters).*" USEPA's TSD also recommends that factors other than effluent data should be considered in the RPA, "*When determining whether or not a discharge causes, has the reasonable potential to cause, or contributes to an excursion of a numeric or narrative water quality criterion for individual toxicants or for toxicity, the regulatory authority can use a variety of factors and information where facility-specific effluent monitoring data are unavailable. These factors also should be considered with available effluent monitoring data.*" With regard to POTWs, USEPA recommends that, "*POTWs should also be characterized for the possibility of chlorine and ammonia problems.*" (TSD, p. 50)

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. Therefore, the Central Valley Water Board finds the discharge has reasonable potential for ammonia and WQBELs are required.

(c) **WQBELs.** The Central Valley Water Board calculates WQBELs in accordance with SIP procedures for non-CTR constituents, and ammonia is a non-CTR constituent. The SIP procedure assumes a 4-day averaging period for calculating the long-term average discharge condition (LTA). However, USEPA recommends modifying the procedure for calculating permit limits for ammonia using a 30-day averaging period for the calculation of the LTA corresponding to the 30-day CCC. Therefore, while the LTAs corresponding to the acute and 4-day chronic criteria were calculated according to SIP procedures, the LTA corresponding to the 30-day CCC was calculated assuming a 30-day averaging period. The lowest LTA representing the acute, 4-day CCC, and 30-day CCC is then selected for deriving the average monthly effluent limitation (AMEL) and the maximum daily effluent limitation (MDEL). The remainder of the WQBEL calculation for ammonia was performed according to the SIP procedures, which also allows for the consideration of seasonal effluent limits. The ammonia criteria are dependent on pH and temperature, so the criteria can vary seasonally (e.g., are typically more stringent in warmer months and less stringent in cooler months). Therefore, since the nitrification process at the Facility is not as efficient during cooler periods, seasonal effluent limits were considered for this discharge. This Order contains seasonal final average monthly effluent limitation (AMEL) and maximum daily effluent limitation (MDEL) for ammonia based on the 2013 NAWQC for protection of freshwater mussels, early life stages of fishes, and salmonids as follows:

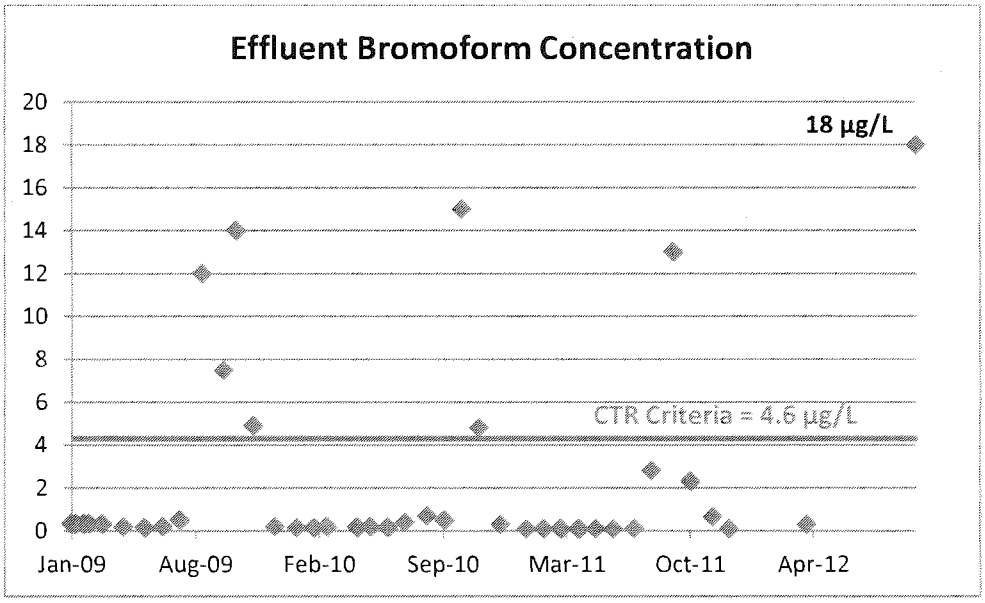
Season	AMEL (mg/L)	MDEL (mg/L)
April 1 – October 31	1.2	4.0
November 1 – November 30	2.3	9.9
December 1 – March 31	2.4	9.6

(d) **Plant Performance and Attainability.** The Central Valley Water Board concludes that immediate compliance with the limitation for ammonia is feasible.

ii. **Bromoform**

(a) **WQO.** The CTR criterion for the protection of human health for waters from which both water and organisms are consumed is 4.3 µg/L for bromoform.

(b) **RPA Results.** The MEC for bromoform was 18 µg/L, in which bromoform was detected in 25 of 47 effluent samples (see figure below). Based on multiple detections above the CTR criterion, the Central Valley Water Board finds the discharge has reasonable potential for bromoform and WQBELs are required.



Bromoform was detected in 1 out of 29 receiving water samples at a concentration of 0.5 µg/L (MDL = 0.15 µg/L and RL = 0.5 µg/L), while the remaining 28 samples were non-detect.

(c) **WQBELs.** The ambient monitoring demonstrates the receiving water has assimilative capacity for bromoform. A dilution credit for bromoform of 8:1 has been granted, based on the available human health dilution (see Attachment F, Section IV.C.2.c.). This Order contains final AMEL and MDEL for bromoform of 38 µg/L and 115 µg/L, respectively (See Attachment H for WQBEL calculations).

(d) **Plant Performance and Attainability.** The Central Valley Water Board concludes that immediate compliance with the limitation for bromoform is feasible.

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 WQBELs are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBELs for pathogens in all permits for POTWs discharging to contact recreational waters).*" USEPA's TSD also recommends that factors other than effluent data should be considered in the RPA, "*When determining whether or not a discharge causes, has the reasonable potential to cause, or contributes to an excursion of a numeric or narrative water quality criterion for individual toxicants or for toxicity, the regulatory authority can use a variety of factors and information where facility-specific effluent monitoring data are unavailable. These factors also should be considered with available effluent monitoring data.*" With regard to POTWs, USEPA recommends that, "*POTWs should also be characterized for the possibility of chlorine and ammonia problems.*" (TSD, p. 50)

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 San Joaquin 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.

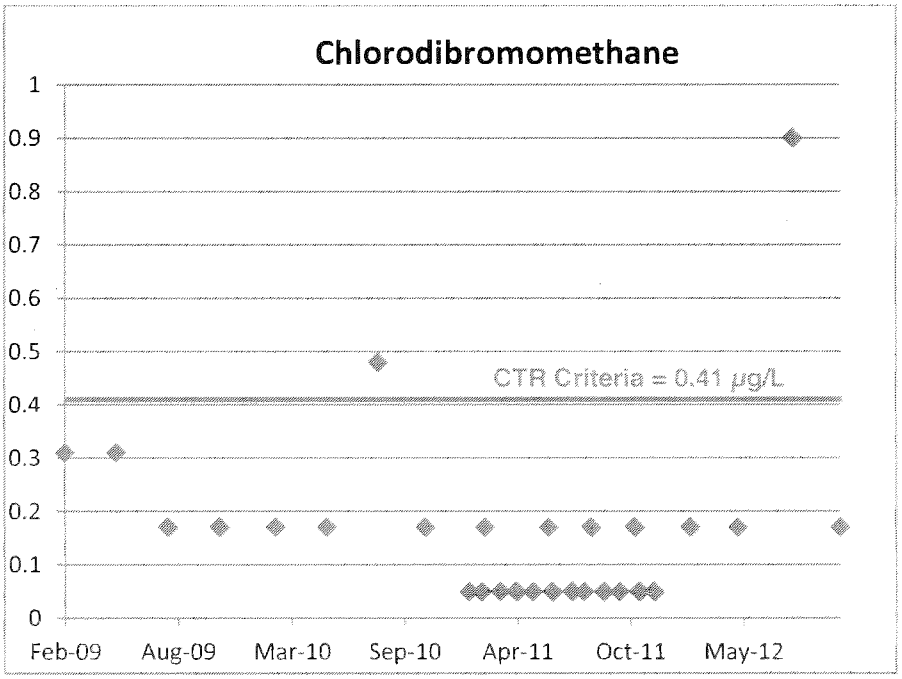
(c) **WQBELs.** The USEPA *Technical Support Document for Water Quality-Based Toxics Control* [EPA/505/2-90-001] contains statistical methods for converting chronic (4-day) and acute (1-hour) aquatic life criteria to average monthly and maximum daily effluent limitations based on the variability of the existing data and the expected frequency of monitoring. However, because chlorine is an acutely toxic constituent that can and will be monitored continuously, an average 1-hour limitation is considered more appropriate than an average daily limitation. This Order contains a 4-day average effluent limitation and 1-hour average effluent limitation for chlorine residual of 0.011 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.** Chlorine has not been detected in the effluent and there is no expectation that it is in the discharge, because the Facility uses a sulfur dioxide process to dechlorinate. The Central Valley Water Board concludes that immediate compliance with these effluent limitations is feasible.

iv. **Chlorodibromomethane**

(a) **WQO.** The CTR includes a chlorodibromomethane criterion of 0.41 µg/L for the protection of human health and is based on a one-in-a-million cancer risk for waters from which both water and organisms are consumed.

(b) **RPA Results.** One receiving water sample was detected but not quantified (DNQ) at 0.48 µg/L and one at a detected concentration of 0.9 µg/L. The two detections in the receiving water are not representative of the ambient receiving concentrations, based on 26 other values being not detected and that these are volatile compounds with no known sources in the nearby ambient environment other than the Facility's effluent (see Figure below). Therefore, the maximum background ambient concentration was set to the lowest of the individual reported method detection limits, which was 0.049 µg/L.



The MEC for chlorodibromomethane was 28 µg/L, based on 55 effluent samples (see figure below). Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for chlorodibromomethane.

(c) **WQBELs.** The ambient monitoring demonstrates the receiving water has assimilative capacity for chlorodibromomethane. A dilution credit for chlorodibromomethane of 13:1 has been granted, based on the available human health dilution (see Attachment F, Section IV.C.2.c.). This Order contains final AMEL and MDEL for chlorodibromomethane of 5.1 µg/L and 14 µg/L, respectively (See Attachment H for WQBEL calculations).

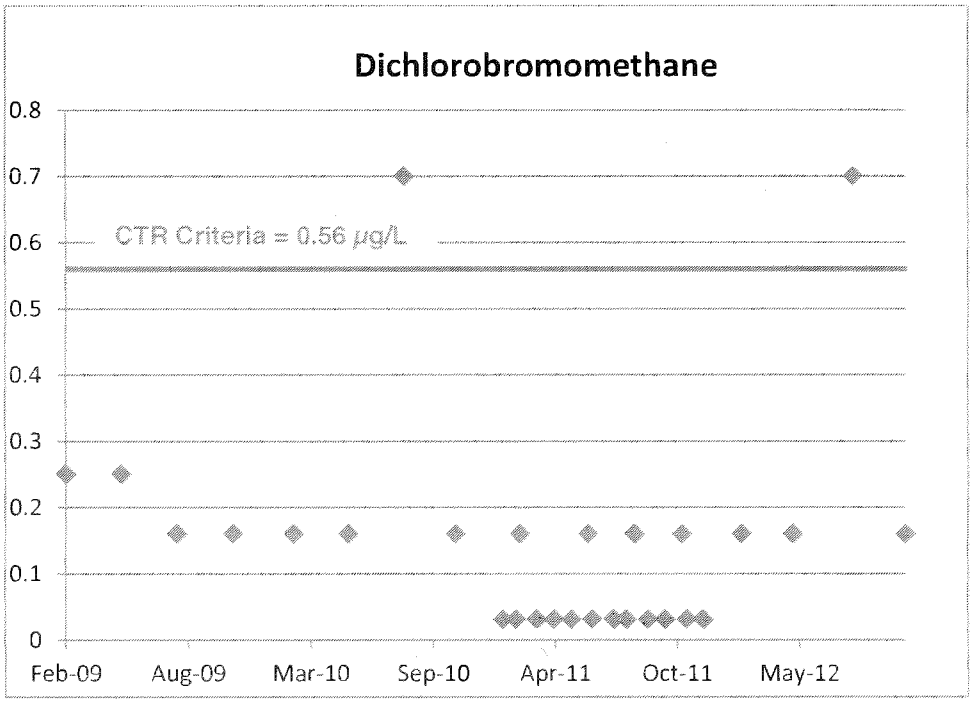
(d) **Plant Performance and Attainability.** The Discharger has implemented measures to reduce chlorodibromomethane concentrations, and although they have been successful at reducing concentrations, not to the levels

needed to consistently comply with these effluent limitations. Time Schedule Order R5-2014-XXXX was adopted on 5/6 June 2014, which established an interim AMEL and MDEL for chlorodibromomethane of 28 µg/L and 76 µg/L, respectively, which will remain in effect until 1 July 2018.

v. **Dichlorobromomethane**

(a) **WQO.** The CTR includes a dichlorobromomethane criterion of 0.56 µg/L for the protection of human health and is based on a one-in-a-million cancer risk for waters from which both water and organisms are consumed.

(b) **RPA Results.** Two receiving water samples were detected at a concentration of 0.7 µg/L. The two detections in the receiving water are not representative of the ambient receiving concentrations, based on 26 other values being not detected and that these are volatile compounds with no known sources in the nearby ambient environment other than the Facility's effluent (see Figure below). Therefore, the maximum background ambient concentration was set to the lowest of the individual reported method detection limits, which was 0.031 µg/L.



The MEC for dichlorobromomethane was 14 µg/L, based on 55 effluent samples (see figure below).Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for dichlorobromomethane.

(c) **WQBELs.** The ambient monitoring demonstrates the receiving water has assimilative capacity for dichlorobromomethane. A dilution credit for dichlorobromomethane of 13:1 has been granted, based on the available human health dilution (see Attachment F, Section IV.C.2.c.). This Order contains final AMEL and MDEL for dichlorobromomethane of 7.4 µg/L and 14 µg/L, respectively (See Attachment H for WQBEL calculations).

(d) **Plant Performance and Attainability.** The Discharger has implemented measures to reduce dichlorobromomethane concentrations, and although they have been successful at reducing concentrations, not to the levels needed to consistently comply with these effluent limitations. Time Schedule Order R5-2014-XXXX was adopted on 5/6 June 2014, which established an interim AMEL and MDEL for dichlorobromomethane of 17 µg/L and 33 µg/L, respectively, which will remain in effect until 1 July 2018.

vi. **Mercury**

(a) **WQO.** The Basin Plan contains fish tissue objectives for all Delta waterways listed in Appendix 43 of the Basin Plan that states, "*...the average methylmercury concentrations shall not exceed 0.08 and 0.24 mg methylmercury/kg, wet weight, in muscle tissue of trophic level 3 and 4 fish, respectively (150-500 mm total length). The average methylmercury concentrations shall not exceed 0.03 mg methylmercury/kg, wet weight, in whole fish less than 50 mm in length.*" The Delta Mercury Control Program contains aqueous methylmercury waste load allocations that are calculated to achieve the fish tissue objectives. Methylmercury reductions are assigned to discharges with concentrations of methylmercury greater than 0.06 ng/l (the concentration of methylmercury in water to meet the fish tissue objectives).

The CTR contains a human health criterion (based on a threshold dose level causing neurological effects in infants) of 50 ng/L for total mercury for waters from which both water and aquatic organisms are consumed. However, in 40 CFR Part 131, USEPA acknowledges that the human health criteria may not be protective of some aquatic or endangered species and that "*...more stringent mercury limits may be determined and implemented through use of the State's narrative criterion.*" In the CTR, USEPA reserved the mercury criteria for freshwater and aquatic life and may adopt new criteria at a later date.

(b) **RPA Results.** Section 1.3 of the SIP states, "*The RWQCB shall conduct the analysis in this section for each priority pollutant with an applicable criterion or objective, **excluding priority pollutants for which a Total Maximum Daily Load (TMDL) has been developed**, to determine if a water quality-based effluent limitation is required in the discharger's permit.*" (emphasis added) Although a RPA is not required, based on the available effluent and receiving water methylmercury data, it appears the discharge is causing or contributing to an exceedance of the concentration of methylmercury in water to meet the site-specific fish tissue objectives in the Basin Plan. The maximum observed effluent methylmercury concentration was 3 ng/L, and the maximum ambient methylmercury concentration was 8.8 ng/L.

(c) **WQBELs.** The Basin Plan's Delta Mercury Control Program includes wasteload allocations for POTWs in the Delta, including for the Discharger. In accordance with 40 CFR 122.44(d)(1)(vii)(B) and the SIP, this Order contains final WQBELs for methylmercury based on the wasteload allocation. The total calendar annual methylmercury load shall not exceed 13 grams.

(d) **Plant Performance and Attainability.** Based on available effluent methylmercury data, the Central Valley Water Board finds the Discharger is

unable to immediately comply with the final WQBELs for methylmercury. Therefore, a compliance schedule in accordance with the State Water Board's Compliance Schedule Policy and the Delta Mercury Control Program has been established in this Order.

vii. **Nitrate and Nitrite**

(a) **WQO.** The discharge of nitrate may impact municipal and aquatic life beneficial uses. Excessive nitrates in drinking water pose a human health concern, particularly for human fetuses and infants. Excessive nitrogen in the form of nitrates can also contribute to excessive algal growth and change the ecology of a waterbody, which has impacts to aquatic life and municipal uses.[1] The applicable narrative water quality objectives are as follows:

- *Chemical Constituents.* Waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. DPH has adopted a primary MCL of 10 mg/L for the sum of nitrate and nitrite, measured as nitrogen, which implements the narrative chemical constituents objective for the protection of the MUN beneficial use.

- *Biostimulatory Substances.* Water shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.

- *Taste and Odors.* 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.

  USEPA has established CWA section 304(a) criteria for total nitrogen of 0.31 mg/L in its Aggregate Ecoregion I criteria[2] that may be used to interpret the biostimulatory substances and taste and odors narrative objectives. USEPA's nutrient criterion for streams and rivers address cultural eutrophication, which is the adverse effects of excess human-caused nutrient inputs. The criterion was derived to represent surface waters that are minimally impacted by human activities and protective of aquatic life and recreational uses.

(b) **RPA Results.** The maximum effluent concentration (MEC) for nitrate was 28 mg/L while the maximum observed upstream receiving water concentration was 3.3 mg/L. The maximum effluent concentration (MEC) for nitrite was 0.44 mg/L while the maximum observed upstream receiving water concentration was 0.18 mg/L. Therefore, nitrate in the discharge has a

[1] Glibert, P.M. 2010. Long-term change in nutrient loading and stoichiometry and their relationships with changes in food web and dominant pelagic fish species in the San Francisco Estuary, California. Reviews in Fisheries Science. 18(2):211-232
Glibert, P.M., et al. 2011. Ecological stoichiometry, biogeochemical cycling, invasive species, and aquatic food webs: San Francisco Estuary and comparative systems. Reviews in Fisheries Science. 19(4):358-417

[2] Ambient Water Quality Criteria Recommendations. Rivers and Streams in Nutrient Ecoregion 1. USEPA December 2001 (EPA 822-B-01-012)

reasonable potential to cause or contribute to an in-stream excursion above the Primary MCL.

The discharge of nitrate also has reasonable potential to cause or contribute to an exceedance of the Basin Plan's narrative water quality objectives for biostimulatory substances and taste and odors. There is evidence in the record that harmful algal blooms and eutrophication is ~~a problem~~occurring in the Delta and in Delta exports (Archibald Consulting et al. 2012)[1](Heidel et al. 2006)[2], therefore, there is no assimilative capacity for ~~additional loading of~~ nutrients, such as nitrate, and the existing discharge is causing or contributing to exceedances of these water quality objectives.

The discharge of nutrients can cause excessive algal growth in the Delta, which impacts the MUN beneficial use by increasing total organic carbon (TOC), reduces water treatment plant efficiency, and causes taste and odor issues. (Heidel et al. 2006) Elevated TOC negatively impacts municipal drinking water suppliers, because it can result in the creation of harmful byproducts during chlorination. Drinking water suppliers must remove TOC prior to chlorination if the TOC concentrations are too high. High ~~algae~~ nutrient levels in source water can also impact water conveyance systems and treatment plants, because algae can clog filters and reduce the efficiency of filtration, and algae and aquatic weeds can clog conveyance systems. Finally, some species of bluegreen algae are associated with the production of compounds such as geosmin and 2-methylisoborneol (MIB) that impart objectionable odors and tastes to waters, even at very low concentrations. Taste and odor problems may be resolved with algaecides. But the predominant algaecides are copper-based, which creates solid waste disposal problems as well as aquatic toxicity issues. Other species of blue green algae, in particular *Anabaena flos-aquae, Microcystis aeruginosa, and Aphanizomenon flos-aquae*, produce neurotoxins that are toxic to humans, fish, and wildlife. These species of algae have also been reported in the Delta according to the Department of Public Health.

(c) **WQBELs.** The Central Valley Water Board is concerned with the effects of the discharge of nutrients, including nitrate and nitrite, on biologically sensitive aquatic resources and critical habitats, as are present in the Sacramento-San Joaquin Delta (Delta) and the impact of nutrients on the use of the water for municipal uses. The recent decline in pelagic fishes in the Delta is referred to as the Pelagic Organism Decline (POD). *Multiple stressors may be leading to POD, including top-down effects (e.g., water diversion, predation), bottom-up effects (e.g., food availability and quality), and the effects of changes in physical and chemical fish habitat (e.g., water quality, contaminants, disease, toxic effects of toxic algal blooms) (Sommer et al. 2007).* The current science is not certain on the precise factors causing the POD. The State Water Board addressed this uncertainty in Order WQ 2012-0013 for the Sacramento Regional Wastewater Treatment Plant as follows, "Neither the Clean Water Act, nor U.S. EPA's regulations allow indefinite delay until better science can be developed, or a statewide

[1] Archibald Consulting et al. 2012. California State Water Project Watershed Sanitary Survey, 2011 Update. Prepared for the State Water Project Contractors Authority and the California Department of Water Resources.
[2] Heidel, K., et al. 2006. Conceptual Model for Nutrients in the Central Valley and Sacramento-San Joaquin Delta,

policy can be adopted. In almost every case, more data can be collected and the hope or anticipation that better science will materialize is always present in the context of science-based agency decision-making...The U.S. Supreme Court has held that U.S. EPA cannot avoid its statutory obligation by noting the presence of uncertainty[1]. Various appellate courts have held that where a complex statute requires an agency to set a numerical standard or effluent limitation, it will not overturn the agency's choice of a precise figure where it falls within the 'zone of reasonableness.'[2] "

The Basin Plan states, "Controllable water quality factors are not allowed to cause further degradation of water quality in instances where other factors have already resulted in water quality objectives being exceeded. Controllable water quality factors are those actions, conditions, or circumstances resulting from human activities that may influence the quality of the waters of the State, that are subject to the authority of the State Water Board or Regional Water Board, and that may be reasonably controlled." (page IV-15.00) Since the Delta is presently exhibiting cultural eutrophication at the current nutrient loading levels[3], discharge at the current nutrient loading will not be protective of downstream beneficial uses. Nutrient reduction is necessary to protect the beneficial uses of the Delta.

This Order contains a final AMEL for nitrate plus nitrite of 10 mg/L (total as N), based on the technical capability of POTWs. An AMEL of 10 mg/L for nitrate plus nitrite as nitrogen is appropriate and is within the zone of reasonableness. This limit is readily achievable using standard denitrification technologies. Although WQBELs based on USEPA's Aggregate Ecoregion I Criteria for total nitrogen would further reduce nutrient loading, WQBELs based on this criteria is not technologically feasible with standard treatment technologies. Additionally, nutrient cycling in waterways is complex. USEPA's Ecoregion I Criteria have not been developed considering the Delta's unique nutrient needs and characteristics; and therefore, may not be directly applicable. The criteria do, however, provide a reference to consider for the protection of aquatic life beneficial uses. The nitrate plus nitrite effluent limit in this Order is protective of the MUN beneficial use, and is a technologically achievable limit that results in a reduction in nutrient loadings from the previous Order that is protective of aquatic life beneficial uses.

(d) **Plant Performance and Attainability.** Analysis of the effluent data shows that the maximum effluent concentration for nitrate of 28 mg/L (as N) is greater than applicable WQBELs. Based on the sample results for the effluent, the limitations appear to put the Discharger in immediate non-compliance. The Discharger submitted an infeasibility analysis on

[1] *Massachusetts v. U.S. Environmental Protection Agency* (2007) 549 U.S. 497, 534.

[2] *Upper Blackstone Water Pollution Abatement Dist. v. U.S. Environmental Protection Agency, supra*, 690 F.3d at p. 28; *National Maritime Safety Assn. v. Occupational Safety & Health Admin.* (D.C. Cir. 2011) 649 F.3d 743, 752; *Reynolds Metals Co. v. U.S. Environmental Protection Agency* (4th Cir. 1985) 760 F.2d 549, 559.

[3] Archibald Consulting et al. 2012. California State Water Project Watershed Sanitary Survey, 2011 Update. Prepared for the State Water Project Contractors Authority and the California Department of Water Resources; Alameda County Flood Control District et al., Summary of Drinking Water Quality Issues and Requested Permit Conditions for the Sacramento Regional Wastewater Treatment Plant NPDES Permit Renewal, (December 2007)

25 March 2014. As discussed in section IV.E.3 of this Fact Sheet, a compliance schedule has been included in this Order.

viii. **Pathogens**

(a) **WQO.** DPH has developed reclamation criteria, CCR, Division 4, Chapter 3 (Title 22), for the reuse of wastewater. Title 22 requires that for spray irrigation of food crops, parks, playgrounds, schoolyards, and other areas of similar public access, wastewater be adequately disinfected, oxidized, coagulated, clarified, and filtered, and that the effluent total coliform levels not exceed 2.2 MPN/100 mL as a 7-day median; 23 MPN/100 mL, not to be exceeded more than once in a 30-day period; and 240 MPN/100 mL, at any time.

Title 22 also requires that recycled water used as a source of water supply for non-restricted recreational impoundments be disinfected tertiary recycled water that has been subjected to conventional treatment. A non-restricted recreational impoundment is defined as *"...an impoundment of recycled water, in which no limitations are imposed on body-contact water recreational activities."* Title 22 is not directly applicable to surface waters; however, the Central Valley Water Board finds that it is appropriate to apply an equivalent level of treatment to that required by the DPH's reclamation criteria because the receiving water is used for irrigation of agricultural land and for contact recreation purposes. The stringent disinfection criteria of Title 22 are appropriate since the undiluted effluent may be used for the irrigation of food crops and/or for body-contact water recreation. Coliform organisms are intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of removing other pathogens.

(b) **RPA Results.** Raw domestic wastewater inherently contains human pathogens that threaten human health and life, and constitute a threatened pollution and nuisance under CWC Section 13050 if discharged untreated to the receiving water. Reasonable potential for pathogens therefore exists and WQBELs 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. Pathogens 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 WQBELs are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBELs for pathogens in all permits for POTWs discharging to contact recreational waters)." USEPA's TSD also recommends that factors other than effluent data should be considered in the RPA, "*When determining whether or not a discharge causes, has the reasonable potential to cause, or contributes to an excursion of a numeric or narrative water quality criterion for individual toxicants or for toxicity, the regulatory authority can use a variety of factors and information where facility-specific effluent monitoring data are unavailable. These factors also should be considered with available effluent monitoring data.*" (TSD, p. 50)

The beneficial uses of the San Joaquin River include municipal and domestic supply, water contact recreation, and agricultural irrigation supply, and there is, at times, less than 20:1 dilution. To protect these beneficial uses, the Central Valley Water Board finds that the wastewater must be disinfected and adequately treated to prevent disease. Although the Discharger provides disinfection, inadequate or incomplete disinfection creates the potential for pathogens to be discharged. Therefore, the Central Valley Water Board finds the discharge has reasonable potential for pathogens and WQBELs are required.

(c) **WQBELs.** In accordance with the requirements of Title 22, this Order includes effluent limitations for total coliform organisms of 2.2 MPN/100 mL as a 7-day median; 23 MPN/100 mL, not to be exceeded more than once in a 30-day period; and 240 MPN/100 mL as an instantaneous maximum.

The tertiary treatment process, or equivalent, is capable of reliably treating wastewater to a turbidity level of 2 nephelometric turbidity units (NTU) as a daily average. Failure of the filtration system such that virus removal is impaired would normally result in increased particles in the effluent, which result in higher effluent turbidity. Turbidity has a major advantage for monitoring filter performance. Coliform testing, by comparison, is not conducted continuously and requires several hours, to days, to identify high coliform concentrations. Therefore, to ensure compliance with the DPH recommended Title 22 disinfection criteria, weekly average specifications are impracticable for turbidity. This Order includes operational specifications for turbidity of 2 NTU as a daily average; 5 NTU, not to be exceeded more than 5 percent of the time within a 24-hour period; and 10 NTU as an instantaneous maximum.

This Order contains effluent limitations for $CBOD_5$, total coliform organisms, and TSS and requires a tertiary level of treatment, or equivalent, necessary to protect the beneficial uses of the receiving water. The Central Valley Water Board has previously considered the factors in Water Code section 13241 in establishing these requirements.

Final WQBELs for BOD_5 and TSS are based on the technical capability of the tertiary process, which is necessary to protect the beneficial uses of the receiving water. BOD_5 is a measure of the amount of oxygen used in the biochemical oxidation of organic matter. The tertiary treatment standards for

BOD_5 and TSS are indicators of the effectiveness of the tertiary treatment process. 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 application of tertiary treatment processes results in the ability to achieve lower levels for BOD_5 and TSS than the secondary standards currently prescribed. Therefore, this Order requires AMELs for BOD_5 and TSS of 10 mg/L, which is technically based on the capability of a tertiary system. In addition to the average weekly and average monthly effluent limitations, a daily maximum effluent limitation for BOD_5 and TSS is 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.** The Central Valley Water Board concludes that immediate compliance with the limitation for pathogens is feasible.

ix. **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 WQBELs 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 WQBELs are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBELs for pathogens in all permits for POTWs discharging to contact recreational waters)."* USEPA's TSD also recommends that factors other than effluent data should be considered in the RPA, *"When determining whether or not a discharge causes, has the reasonable potential to cause, or contributes*

to an excursion of a numeric or narrative water quality criterion for individual toxicants or for toxicity, the regulatory authority can use a variety of factors and information where facility-specific effluent monitoring data are unavailable. These factors also should be considered with available effluent monitoring data." (TSD, p. 50)

The Facility is a POTW that treats domestic wastewater. Based on the continuous record from January 2009 to December 2012, the maximum pH reported was 7.6 and the minimum was 6.5. The Facility did not exceed the instantaneous maximum or minimum effluent limitations.

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

(d) **Plant Performance and Attainability.** The Central Valley Water Board concludes that immediate compliance with the limitations for pH is feasible.

x. **Temperature**

(a) **WQO.** The Thermal Plan requires that, "*The maximum temperature shall not exceed the natural receiving water temperature by more than 20°F.*"

(b) **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 Thermal Plan. Therefore, reasonable potential exists for temperature and WQBELs 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. 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 WQBELs are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBELs for pathogens in all permits for POTWs discharging to contact recreational waters).*" USEPA's TSD also recommends that factors other than effluent data should be considered in the RPA, "*When determining whether or*

not a discharge causes, has the reasonable potential to cause, or contributes to an excursion of a numeric or narrative water quality criterion for individual toxicants or for toxicity, the regulatory authority can use a variety of factors and information where facility-specific effluent monitoring data are unavailable. These factors also should be considered with available effluent monitoring data." (TSD, p. 50)

The Facility is a POTW that treats domestic wastewater, which is an elevated temperature waste. This provides the basis for the discharge to have a reasonable potential to cause or contribute to an excursion above Thermal Plan requirements.

(c) **WQBELs.** To ensure compliance with the Thermal Plan, an effluent limitation for temperature is included in this Order.

(d) **Plant Performance and Attainability.** Based on existing Facility performance it appears the Discharger can immediately comply with the temperature effluent limits.

4. WQBEL Calculations

a. This Order includes WQBELs for ammonia, bromoform, chlorodibromomethane, chlorpyrifos, diazinon, dichlorobromomethane, dissolved oxygen, electrical conductivity, methylmercury, nitrate plus nitrite (total as N), and total residual chlorine. The general methodology for calculating WQBELs based on the different criteria/objectives is described in subsections IV.C.4.b through e, below. For electrical conductivity, however, a performance-based effluent limitation was calculated as the mean plus 3.3 standard deviations based on the most recent monitoring data. See Attachment H for all applicable WQBEL calculations.

b. **Effluent Concentration Allowance.** For each water quality criterion/objective, the ECA is calculated using the following steady-state mass balance equation from Section 1.4 of the SIP:

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

where:

ECA = effluent concentration allowance
D = dilution credit
C = the priority pollutant criterion/objective
B = the ambient background concentration.

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

c. **Basin Plan Objectives and MCLs.** For WQBELs based on site-specific numeric Basin Plan objectives or MCLs, the effluent limitations are applied directly as the ECA as either an MDEL, AMEL, or average annual effluent limitations, depending on the averaging period of the objective.

d. **Aquatic Toxicity Criteria.** WQBELs based on acute and chronic aquatic toxicity criteria are calculated in accordance with Section 1.4 of the SIP. The ECAs are converted to equivalent long-term averages (i.e. 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.** WQBELs based on human health criteria, are also calculated in accordance with Section 1.4 of the SIP. ~~The ECAs are~~ AMEL is set equal to the ~~AMEL~~ ECA and a statistical multiplier was used to calculate the MDEL.

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

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

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

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
Ammonia Nitrogen, Total (as N) April 1 – October 31	mg/L	1.2	-	4.0	--	--
	lbs/day[1]	560	-	1900	--	--
Ammonia Nitrogen, Total (as N) November 1 – November 30	mg/L	2.3	-	9.9	--	--
	lbs/day[1]	1100	-	4600	--	--
Ammonia Nitrogen, Total (as N) December 1 – March 31	mg/L	2.4	-	9.6	--	--
	lbs/day[1]	1200	-	2200	--	--

Bromoform	µg/L	38	--	115	--	--
Carbonaceous Biochemical Oxygen Demand (5-day @ 20°C)	mg/L	10	15	20	--	--
	lbs/day[1]	4600	6900	9200	--	--
Chlorine, Total Residual	mg/L	--	0.011[2]	0.019[3]	--	--
Chlorodibromomethane	µg/L	5.1	--	14	--	--
Chlorpyrifos	µg/L	[4]	--	[5]	--	--
Diazinon	µg/L	[4]	--	[5]	--	--
Dichlorobromomethane	µg/L	7.4	--	14	--	--
Electrical Conductivity @ 25°C	µmhos/cm	1,300[6]	--	--	--	--
Methylmercury	grams	13[7]	--	--	--	--
Nitrate plus Nitrite Nitrogen, Total (as N)	mg/L	10	--	--	--	--
pH	standard units	--	--	--	6.5	8.5
Total Suspended Solids	mg/L	10	15	20	--	--
	lbs/day[1]	4590	6885	9180	--	--
Total Coliform Organisms	MPN/100 mL	--	2.2[8]	23[9]	--	240

1 Based upon an average dry weather flow of 55 MGD.

2 Applied as a 4-day average effluent limitation.

3 Applied as a 1-hour average effluent limitation.

4 $$S_{avg} = \frac{C_{D\ avg}}{0.08} + \frac{C_{C\ avg}}{0.012} \leq 1.0$$

CD-avg = average monthly diazinon effluent concentration in µg/L
CC-avg = average monthly chlorpyrifos effluent concentration in µg/L

5 $$S_{max} = \frac{C_{D\ max}}{0.16} + \frac{C_{C\ max}}{0.025} \leq 1.0$$

CD-avg = maximum daily diazinon effluent concentration in µg/L
CC-avg = maximum daily chlorpyrifos effluent concentration in µg/L

6 Applied as a calendar annual average.

7 The total calendar annual load of methylmercury shall not exceed 13 grams.

8 Applied as a 7-day median effluent limitation.

9 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.

i. **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 WQBELs are required for specific pollutants for all facilities that exhibit certain operational or discharge characteristics (e.g., WQBELs for pathogens in all permits for POTWs discharging to contact recreational waters).*" Although the discharge has been consistently in compliance with the acute effluent limitations, the Facility is a POTW that treats domestic wastewater containing ammonia and other acutely toxic pollutants. Acute toxicity effluent limits are required to ensure compliance with the Basin Plan's narrative toxicity objective.

USEPA Region 9 provided guidance for the development of acute toxicity effluent limitations in the absence of numeric water quality objectives for toxicity in its document titled "Guidance for NPDES Permit Issuance", dated February 1994. In section B.2. "Toxicity Requirements" (pgs. 14-15) it states that, "In the absence of specific numeric water quality objectives for acute and chronic toxicity, the narrative criterion 'no toxics in toxic amounts' applies. Achievement of the narrative criterion, as applied herein, means that ambient waters shall not demonstrate for acute toxicity: 1) less than 90% survival, 50% of the time, based on the monthly median, or 2) less than 70% survival, 10% of the time, based on any monthly median. For chronic toxicity, ambient waters shall not demonstrate a test result of greater than 1 TUc." Accordingly, effluent limitations for acute toxicity have been included in this Order as follows:

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

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

ii. **Chronic Aquatic Toxicity.** The Basin Plan contains a narrative toxicity objective that states, "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at page III-8.00) Based on chronic WET testing performed by the Discharger from December 2008 through October 2012, the discharge has reasonable potential to cause or contribute to an in-stream excursion above of the Basin Plan's narrative toxicity objective. As shown in Table F-~~13~~ 14 below.

Table F-14. Whole Effluent Chronic Toxicity Testing Results

Date	Fathead Minnow *Pimephales promelas*	Water Flea *Ceriodaphnia dubia*	Green Algae *Selenastrum capricornutum*

	Survival (TUc)	Growth (TUc)	Survival (TUc)	Reproduction (TUc)	Growth (TUc)
12/22/2008	NS	NS	1	1	NS
1/5/2009	NS	NS	1	1	NS
1/12/2009	1	1	NS	NS	1
1/19/2009	NS	NS	1	2[a]	NS
4/6/2009	1	1	1	1	1
7/13/2009	1	1	1	1	1
10/19/2009	1	1	1	1	1
1/19/2010	NS	NS	1	1	1
1/25/2010	1	1	NS	NS	NS
4/12/2010	1	1	1	1	1
7/13/2010	1	1	1	1.3	1
10/11/2010	1	1	1	2	1
11/8/2010	NS	NS	1	2[a]	NS
11/21/2010	NS	NS	1	1	NS
12/6/2010	NS	NS	1	4[a]	NS
12/13/2010	NS	NS	1	1	NS
1/17/2011	1	1	1	1	1
4/25/2011	1	1	1	1	1
7/18/2011	1	1	F	F	1
8/7/2011	NS	NS	1	1	NS
10/24/2011	1	1	1	8	1
11/14/2011	NS	NS	1	2[b]	NS
12/12/2011	NS	NS	1	1[c]	NS
1/9/2012	NS	NS	1	1[c]	NS
1/23/2012	1	1	1	F	2
2/6/2012	NS	NS	1	1[c]	1
2/20/2012	NS	NS	NS	NS	1
2/22/2012	NS	NS	1	1[c]	NS
3/7/2012	NS	NS	1	1[c,d]	1
3/19/2012	NS	NS	NS	NS	1
4/9/2012	1	1	1	1	1
7/16/2012	1	1	1	1	2
7/29/2012	NS	NS	NS	NS	1
8/12/2012	NS	NS	NS	NS	1
8/26/2012	NS	NS	NS	NS	1
9/9/2012	NS	NS	NS	NS	1
10/15/2012	1	1	1	1	1

NS: not sampled

F: test failed test acceptability criteria

[a] Not a statistically significant ($p<0.05$) reduction in reproduction relative to laboratory control. Receiving water control was stimulatory.

[b] Toxicity reduction evaluation initiated.

[c] Test conducted as formal part of toxicity reduction evaluation.

[d] Toxicity reduction evaluation concluded.

No dilution has been granted for the chronic condition. Therefore, chronic toxicity testing results exceeding 1 chronic toxicity unit (TUc) demonstrates the discharge has a reasonable potential to cause or contribute to an exceedance of the Basin Plan's narrative toxicity objective.

The Monitoring and Reporting Program of this Order requires quarterly chronic WET monitoring, the Discharger has prepared a TRE Workplan which has been approved by the Executive Officer. The TRE Workplan ensures that the Discharger has a plan in place to immediately move forward with the initial tiers of a TRE, in the event toxicity is encountered in the future. The Special Provision in section IV.C.2.a includes a numeric toxicity monitoring trigger, requirements for accelerated monitoring, and requirements for TRE initiation if toxicity is demonstrated.

Numeric chronic WET effluent limitations have not been included in this Order. The SIP contains implementation gaps regarding the appropriate form and implementation of chronic toxicity limits. This has resulted in the petitioning of a NPDES permit in the Los Angeles Region[1] that contained numeric chronic toxicity effluent limitations. To address the petition, the State Water Board adopted WQO 2003-012 directing its staff to revise the toxicity control provisions in the SIP. The State Water Board states the following in WQO 2003-012, "*In reviewing this petition and receiving comments from numerous interested persons on the propriety of including numeric effluent limitations for chronic toxicity in NPDES permits for publicly-owned treatment works that discharge to inland waters, we have determined that this issue should be considered in a regulatory setting, in order to allow for full public discussion and deliberation. We intend to modify the SIP to specifically address the issue. We anticipate that review will occur within the next year. We therefore decline to make a determination here regarding the propriety of the final numeric effluent limitations for chronic toxicity contained in these permits.*" The process to revise the SIP is currently underway. Proposed changes include clarifying the appropriate form of effluent toxicity limits in NPDES permits and general expansion and standardization of toxicity control implementation related to the NPDES permitting process. Since the toxicity control provisions in the SIP are under revision it is infeasible to develop numeric effluent limitations for chronic toxicity. Therefore, this Order requires that the Discharger meet best management practices for compliance with the Basin Plan's narrative toxicity objective, as allowed under 40 CFR 122.44(k).

To ensure compliance with the Basin Plan's narrative toxicity objective, the Discharger is required to conduct chronic WET testing, as specified in the Monitoring and Reporting Program (Attachment E section V.). Furthermore, the Special Provision contained at VI.C.2.a. of this Order requires the Discharger to investigate the causes of, and identify and implement corrective actions to reduce or eliminate effluent toxicity. If the discharge demonstrates toxicity exceeding the numeric toxicity monitoring trigger, the Discharger is required to initiate a Toxicity Reduction Evaluation

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

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

D. Final Effluent Limitation Considerations

1. Mass-based Effluent Limitations

40 CFR 122.45(f)(1) requires effluent limitations be expressed in terms of mass, with some exceptions, and 40 CFR 122.45(f)(2) allows pollutants that are limited in terms of mass to additionally be limited in terms of other units of measurement. This Order includes effluent limitations expressed in terms of mass and concentration. In addition, pursuant to the exceptions to mass limitations provided in 40 CFR 122.45(f)(1), some effluent limitations are not expressed in terms of mass, such as pH and temperature, and when the applicable standards are expressed in terms of concentration (e.g., CTR criteria and MCLs) and mass limitations are not necessary to protect the beneficial uses of the receiving water.

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

2. Averaging Periods for Effluent Limitations

40 CFR 122.45 (d) requires average weekly and average monthly discharge limitations for publicly owned treatment works (POTWs) unless impracticable. However, for toxic pollutants and pollutant parameters in water quality permitting, USEPA recommends the use of a maximum daily effluent limitation in lieu of average weekly effluent limitations for two reasons. "*First, the basis for the 7-day average for POTWs derives from the secondary treatment requirements. This basis is not related to the need for assuring achievement of water quality standards. Second, a 7-day average, which could comprise up to seven or more daily samples, could average out peak toxic concentrations and therefore the discharge's potential for causing acute toxic effects would be missed.*" (TSD, pg. 96) This Order uses maximum daily effluent limitations in lieu of average weekly effluent limitations for ammonia, bromoform, chlorodibromomethane, dichlorobromomethane, diazinon and chlorpyrifos as recommended by the TSD for the achievement of water quality standards and for the protection of the beneficial uses of the receiving stream. Furthermore, for $CBOD_5$, pH, total coliform, and TSS, weekly average effluent limitations have been replaced or supplemented with effluent limitations utilizing shorter averaging periods. The rationale for using shorter averaging periods for these constituents is discussed in section IV.C.3 of this Fact Sheet.

For effluent limitations based on Primary and Secondary MCLs, except nitrate and nitrite, this Order includes annual average effluent limitations. The Primary and Secondary MCLs are drinking water standards contained in Title 22 of the California Code of Regulations. Title 22 requires compliance with these standards on an annual average basis (except for nitrate and nitrite), when sampling at least quarterly. Since it is necessary to determine compliance on an annual average basis, it is impracticable to calculate average weekly and average monthly effluent limitations.

3. Satisfaction of Anti-Backsliding Requirements

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

The effluent limitations in this Order are at least as stringent as the effluent limitations in the previous Order, with the exception of effluent limitations for aluminum, ammonia (as N), bis(2-ethylhexyl) phthatlate, cyanide, ~~dissolved oxygen,~~ manganese and molybdenum. The effluent limitations for these pollutants are less stringent than, or removed from, those in Order R5-2008-0154. 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 TMDLs 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 San Joaquin River is considered an attainment water for aluminum, ammonia (as N), bis(2-ethylhexyl) phthatlate, cyanide, ~~dissolved oxygen,~~ manganese and molybdenum because the receiving water is not listed as impaired on the 303(d) list for these constituents. As discussed in section IV.D.4, below, relaxation of the effluent limits complies with federal and state antidegradation requirements. Thus, relaxation of the effluent limitations for aluminum, ammonia (as N), bis(2-ethylhexyl) phthatlate, cyanide, ~~dissolved oxygen,~~ manganese and molybdenum from Order R5-2008-0154 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 R5-2008-0154 was issued indicates that aluminum, bis(2-ethylhexyl) phthatlate, cyanide, ~~dissolved oxygen,~~ manganese and molybdenum do not exhibit reasonable potential to cause or contribute to an exceedance of water quality objectives in the receiving water. Furthermore, new seasonal effluent limitations have been calculated for ammonia (as N) that are less stringent than the year-round effluent limits in the previous Order for a portion of the year. The updated information that supports the relaxation of effluent limitations for these constituents includes the following:

iii. **Aluminum.** Effluent monitoring data collected between June 2011 and December 2012 indicates that aluminum in the discharge does not exhibit reasonable potential to cause or contribute to an exceedance of the Secondary MCL.

iv. **Ammonia (as N).** This Order includes seasonal effluent limitations for ammonia as shown in the table below:

Season	AMEL mg/L Ammonia as N	MDEL mg/L Ammonia as N
April 1 – October 31	1.2	4.0
November 1 – November 30	2.3	9.9
December 1 – March 31	2.4	9.6

Previous Order R5-2008-0154 included year-round effluent limits for ammonia of 2 mg/L (as N) as an AMEL and 5 mg/L (as N) as an MDEL. Therefore, the new effluent limits from 1 November – 31 March are less stringent in this Order. These new effluent limits are based on new information. Since adoption of the previous Order the USEPA published new National Ambient Water Quality Criteria for Ammonia in August 2013. The new criteria are based on temperature and pH. Effluent pH and temperature data collected since the adoption of the previous Order were used to calculate the criteria. In addition, the Facility was upgraded to provide nitrification, so new ammonia effluent data was used to establish the statistics for calculating the water quality-based effluent limitations.

v. **Bis(2-ethylhexyl) phthalate.** Effluent and receiving water monitoring data collected between June 2011 and December 2012 for bis (2-ethylhexyl) phthalate indicates that the discharge does not exhibit reasonable potential to cause or contribute to an exceedance of the CTR human health criteria.

vi. **Cyanide.** Effluent and receiving water monitoring data collected between January 2012 and December 2012 for cyanide indicates that the discharge does not exhibit reasonable potential to cause or contribute to an exceedance of the CTR criteria for the protection of freshwater aquatic life.

~~vii. **Dissolved Oxygen.** Effluent and receiving water monitoring data for dissolved oxygen indicates that the discharge does not exhibit reasonable potential to cause or contribute to an in-stream excursion below the Basin Plan objective. Additionally, this Order contains receiving water limitations for dissolved oxygen.~~

~~viii.~~ vii. **Manganese.** Effluent monitoring data collected between July 2007 and December 2012 indicates that manganese in the discharge does not exhibit reasonable potential to cause or contribute to an exceedance of the Secondary MCL.

~~ix.~~ viii. **Molybdenum.** Effluent monitoring data collected between January 2008 and December 2012 indicates that molybdenum in the discharge does not exhibit reasonable potential to cause or contribute to an exceedance of the numeric standard that implements the narrative objective is the Agricultural Water Quality Goal of 10 µg/L.

4. Anti-Degradation 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 WQBELs where the discharge could have the reasonable potential to cause or contribute to an exceedance of water quality standards. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution No. 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

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

This Order includes less stringent effluent limits from the previous Order for aluminum, ammonia (as N), bis(2-ethylhexyl) phthatlate, cyanide, ~~dissolved oxygen,~~ manganese and molybdenum. The Facility was upgraded to include Title 22 (or equivalent) tertiary filtration since the previous Order was issued. Based on improved effluent quality the discharge no longer exhibits reasonable potential for aluminum, ~~dissolved oxygen,~~ manganese and molybdenum. The Discharger used improved sampling and analytical techniques for bis(2-ethylhexyl) phthatlate and cyanide to demonstrate the discharge no longer exhibits reasonable potential for these constituents. Finally, although seasonally the effluent limits for ammonia (as N) are less stringent, the overall nitrogen requirements are significantly more stringent in this Order due to more stringent effluent limits for nitrate plus nitrite. Therefore, the small increase in ammonia is offset by the decrease in total nitrogen discharged. The relaxation of these effluent limits is consistent with the maximum benefit to the people of the State, will not unreasonably affect beneficial uses, will not cause water quality to be less than water quality objectives, and the discharge provides protection for existing in-stream uses and water quality necessary to protect those uses.

b. **Groundwater.** The Discharger utilizes three ponds and engineered treatment wetlands. Domestic wastewater contains constituents such as total dissolved solids (TDS), specific conductivity, pathogens, nitrates, organics, metals and oxygen demanding substances (BOD). Percolation from the ponds may result in an increase in the concentration of these constituents in groundwater. The increase in the concentration of these constituents in groundwater must be consistent with Resolution No. 68-16. Any increase in pollutant concentrations in groundwater must be shown to be necessary to allow wastewater utility service necessary to accommodate housing and economic expansion in the area and must be consistent with maximum benefit to the people of the State of California. Some degradation of groundwater by the Discharger is consistent with Resolution No. 68-16 provided that:

i. the degradation is limited in extent;

ii. the degradation after effective source control, treatment, and control is limited to waste constituents typically encountered in municipal wastewater as specified in the groundwater limitations in this Order;

iii. the Discharger minimizes the degradation by fully implementing, regularly maintaining, and optimally operating best practicable treatment and control (BPTC) measures; and

iv. the degradation does not result in water quality less than that prescribed in the Basin Plan.

Groundwater monitoring results, submitted as part of the *Background Groundwater Quality Characterization Technical Report for the City of Stockton Regional Wastewater Control Facility*, show that nitrate and salinity have degraded groundwater quality when compared to background. Water quality objectives for nitrate and salinity are outlined in section IV.C.3 of the Fact Sheet, above. This Order, therefore, establishes some groundwater limitations to assure protection of beneficial uses of groundwater (see section V.B in the Limitations and Discharge Requirements section of this Order), provisionally requires the Discharger to a corrective action plan and implementation schedule for necessary modifications (see section VI.C.~~2.c~~7.b in the Limitations and Discharge Requirements section of this Order), and includes a reopener to consider a revision or addition of the final groundwater limitations if necessary when additional analytical monitoring results or other information are obtained. During this period, degradation may occur from certain constituents, but cannot exceed water quality objectives (or natural background water quality should it exceed objectives) or cause nuisance. For additional information see Section V.B of this Fact Sheet.

5. Groundwater Quality

A report, *Background Groundwater Quality Characterization Technical Report City of Stockton Regional Wastewater Control Facility* (Condor, 2013), was prepared in response to the City of Stockton's previous Order R5-2008-0154 to characterize background groundwater quality conditions within influence of the Facility's discharge. Condor evaluated approximately 13,000 data values, sampled over a 9-year monitoring period, comprised of groundwater monitoring from a network of 21 active wells that are sampled quarterly or semi-annually, surface water, pond effluent, and stable isotope sample results.

Background and Hydrologic Conditions. The Facility is located in the San Joaquin Delta, along the San Joaquin River (SJR) north of State Route 4, with Rough and Ready Island is located to the north, an industrial area across the SJR to the northeast and east, and agricultural lands are located to the south and west (Attachment C). Approximately 600 acres of oxidation ponds and wetlands, at mean sea level, are adjacent to the SJR and Burns Cutoff. Surface waters adjacent to the Facility are tidal and in low water times, pumping to the California Aqueduct at Clifton Court Forebay, both of which contribute to flow reversal and water level fluctuation in the SJR. The minimum river stage is above the ground surface elevation of the surrounding farmland.

In general, areas of poor water quality with high salinity exist throughout the Delta subbasin. TDS values range from 210 to 7800 mg/L and average about 1190 mg/L and elevated chloride and nitrate levels occur in several areas within the Delta subbasin (California's Groundwater, Bulletin 118, 20 January 2006). ~~Monitoring results obtained along this segment of the SJR from January 2009 through December 2012 indicate an~~

~~average TDS value of about 279 mg/L, which is significantly lower than the subbasin levels.~~

Hydrogeology. The hydrogeology of the Facility and surrounding area is described in detail in the *Report of Groundwater Conditions in the Vicinity of the Stockton Regional Wastewater Facility* (Condor, 2006). In summary, the Facility is located on the SJR flood plain and is a natural regional groundwater discharge area. Agricultural practices require pumping from adjacent drains and ditches thereby lowering groundwater. *Geologic well borings show the Facility is underlain by approximately 25 feet of silty clay, silt and clay. "Groundwater occurs within discrete discontinuous layers of sandy channel deposits and moves in response to low gradients controlled by drainage canals and pumping. Many isolated pockets of stagnant groundwater are expected to occur around and under the Facility ponds and constructed wetlands. The hydrogeologic flow conditions around the Site are relatively static. Gradients are low, and aquifers are of low transmissivity and storage. Potential recharge areas are inferred from surface water elevations in the SJR and the ponds. Stable isotopes suggest that precipitation is a larger contributor to groundwater recharge than the river, and a flat well hydrograph at MW-14 shows locally poor hydraulic connection to surface water in the river occurs."* (Condor, 2013)

Groundwater Monitoring Network and Chemistry. There are 21 active monitoring wells surrounding the Facility and SJR, which are shown in ~~Appendix~~ Attachment C. Grab samples and stable isotope samples are taken either quarterly or semi-annually. By 17 December 2003, the Discharger installed fourteen monitoring wells (MW1 – MW14), and to identify background groundwater quality, two additional monitoring wells were installed (MW15 and MW16). Surface water samples were also obtained from the San Joaquin River near (1) Garwood Bridge, (2) the intersection of San Joaquin River and Burns Cutoff, (3) Pond No. 2, (4) the Agricultural Ditch West of Pond #3, and (5) Pump Station near Oxidation Pond #1. In 2005, two additional monitoring wells were installed, MW-17 and MW-18. MW-17 was installed down gradient (east) of MW-13, which contained nitrate concentrations that exceed the MCL. MW-18 was installed outboard of the recirculation canal to relocate MW-4, which may have been influenced by, or directly hydraulically connected to, the recirculation canal and therefore may not be representative of groundwater conditions (Condor, 2006). MW-19 was installed in April 2009 between pond 1 and pond 2.

Non-parametric statistical review of each monitored constituent was conducted to identify areas of potential threat of groundwater degradation. The background groundwater characterization indicates two monitoring wells, MW-10 and MW-12, have likely been impacted by the Facility's discharge. Quarterly samples of electrical conductivity (EC), total dissolved solids (TDS), ammonia, nitrate as nitrogen, Total Kjeldahl Nitrogen (TKN), and total coliform were collected. Water quality as indicated by the analytical results shows ~~high levels of EC and TDS~~levels of EC and TDS within expected background ranges but exceeding Basin Plan water quality objectives in monitoring wells MW-1, MW-2, MW-3, MW-4, MW-5, MW-6, MW-7, MW-8, MW-9, MW-10, MW-12, MW-13, MW-14, MW-15, MW-16, MW-17, and MW-18. Analytical results also ~~show high levels~~include concentrations of nitrate in monitoring wells MW-10 ~~and~~, MW-13, and MW-15, and ~~high levels~~concentrations of total coliform in monitoring wells MW-7, MW-8, MW-9, MW-13, MW-15 and MW-17 exceeding the Basin Plan water quality objectives.

Groundwater Limits.

The Basin Plan stipulates that when the background condition(s) is less stringent than the numeric water quality objective, the background condition supercedes the numeric water quality objective. Therefore establishing the numeric level at which constituents of concern are present in the groundwater with no influence from the Facility is relevant in determining if the discharge degrades groundwater and in evaluating the performance of the Facility's ~~BPCT~~ BPTC measures. Since anthropogenic activities do not affect all aspects of water quality, it is possible that background water quality conditions can exist for one constituent but not for another, and therefore, generalizations about the subbasin water quality conditions may not adequately protect the beneficial uses. The 2013 Condor report concluded that concentrations of nitrate (as N) have been exceeded at MW-10 and ~~degredation~~ degradation of local groundwater with respect to salinity, ~~specifically~~ potentially boron, at MW-12, which indicate possible impacts from the Facility.

In allowing a discharge, the Regional Water Board must comply with CWC Section 13263 in setting appropriate conditions. The Regional Water Board is required, relative to the groundwater that may be affected by the discharge, to implement the Basin Plan and consider the beneficial uses to be protected along with the water quality objectives essential for that purpose. The Regional Water Board need not authorize the full utilization of the waste assimilation capacity of the groundwater (CWC 13263(b)) and must consider other waste discharges and factors that affect that capacity.

TDS and EC concentrations in nearly all wells~~, including at times the background wells,~~ exceed water quality objectives. ~~However, high TDS and EC concentration values in localized areas such as monitoring wells MW-1 and MW-2 located between Pond #1 and the San Joaquin River on the western portion of the Facility, indicate that the treated domestic wastewater may be impacting groundwater. Further indications that MW-1 and MW-2 may be locally impacted comes from a~~ Salinity exceeding Basin Plan water quality objectives occurs in such wells as MW-1 or MW-2 located between Pond #1 and the San Joaquin River. A hydrograph study finding ~~that~~ states "there is a net hydrostatic pressure gradient towards the river from the ponds." (Condor Earth Technologies, Inc. September 2006) Also, nitrate concentration values in MW-10 located near the San Joaquin River and the effluent discharge on the western portion of the Facility indicate that certain wastewater control practices may not be justified as representative of Best Practicable Treatment and Control (BPTC). On the eastern portion of the Facility, high TDS and EC concentrations in MW-12, MW-13 and MW-17 and high nitrate concentrations in MW-13 and MW-17 indicate that certain aspects of wastewater treatment and control practices also may not be justified as representative of BPTC, or certain operation and maintenance practices may not be justified as best management practices. Still, insufficient data has been reported to establish background groundwater conditions, even though it appears that groundwater in the aquifer beneath the Facility may be impacted for beneficial uses. Though groundwater monitoring has been conducted around the Facility, additional background groundwater quality data are needed to establish the most appropriate groundwater limits. Reasonable time is necessary to gather specific information about the Facility to make informed, appropriate, long-term decisions.

Therefore, this Order provisionally requires the Discharger to install additional monitoring wells and any other testing needed to effectively and fully characterize background quality conditions. Based on this information, the Discharger must technically evaluate the Facility's processes or storage areas and submit a time schedule to implement or modify BPTCs as necessary. This Order also contains narrative and numeric

groundwater limitations that become effective upon completion of the background quality condition and BPTC evaluation studies. This Order contains a reopener to add or modify groundwater limitations as necessary.

In addition, this Order requires the continued monitoring of the groundwater monitoring network, not in its entirety, to monitor the impact of the discharge and help develop long-term groundwater limits. This Order also requires monitoring of the pond water to determine whether degradation of the groundwater for certain constituents from percolation of the treated domestic wastewater stored in the unlined facultative ponds is consistent with maximum benefit to the people of California, and thus, complies with Antidegradation Policy.

6. Stringency of Requirements for Individual Pollutants

This Order contains both technology-based effluent limitations and WQBELs for individual pollutants. The technology-based effluent limitations consist of restrictions on flow and percent removal requirements for $CBOD_5$ and TSS. The WQBELs consist of restrictions on ammonia, bromoform, $CBOD_5$, chlorine residual (total), coliform organisms (total), chlorodibromomethane, chlorpyrifos, diazinon, dichlorobromomethane, dissolved oxygen, electrical conductivity, mercury, methylmercury, nitrate plus nitrite, pH and TSS. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements. In addition, this Order includes new effluent limitations for nitrate plus nitrite (as N) and to meet numeric objectives to protect beneficial uses.

This Order does not contain pollutant restrictions that are more stringent than applicable federal requirements and standards.

Water quality-based effluent limitations have been derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that toxic pollutant water quality-based effluent limitations were derived from the CTR, the CTR is the applicable standard pursuant to 40 C.F.R. section 131.38. The procedures for calculating the individual water quality-based effluent limitations for priority pollutants are based on the CTR implemented by the SIP, which was approved by U.S. EPA on May 18, 2000. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by U.S. EPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to U.S. EPA prior to May 30, 2000, but not approved by U.S. EPA before that date, are nonetheless "applicable water quality standards for purposes of the CWA" pursuant to 40 C.F.R. section 131.21(c)(1).

Summary of Final Effluent Limitations
Discharge Point No. EFF-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	
Ammonia (as N) Apr 1 – ~~Nov 30~~Oct 31	mg/L	1.2	-	4.30	--	--	NAWQC
	lbs/day[2]	560	-	~~2000~~1900	--	--	
Ammonia (as N)	mg/L	2.53	-	9.9	--	--	NAWQC

Parameter	Units	Effluent Limitations					Basis[1]
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
~~Dec~~ Nov 1 – ~~Mar 31~~Nov 30	lbs/day[2]	~~1200~~1100	-	4600	--	--	
Ammonia (as N)	mg/L	2.4	-	9.6	--	--	NAWQC
Dec 1 – Mar 31	lbs/day[2]	1200	-	4500	--	--	
Bromoform	µg/L	38	--	115	--	--	CTR
Carbonaceous Biochemical Oxygen Demand ($CBOD_5$)	mg/L	10	15	20	--	--	TTC
	lbs/day[2]	4600	6900	9200	--	--	
Chlorine, Total Residual	mg/L	--	0.011[3]	0.019[4]	--	--	NAWQC
Chlorodibromomethane	µg/L	5.1	--	14	--	--	CTR
Chlorpyrifos	µg/L	[5]	--	[6]	--	--	BP
Coliform Organisms, Total	MPN/ 100 mL	--	2.2[7]	23[8]	--	240	Title 22
Diazinon	µg/L	[5]	--	[6]	--	--	BP
Dichlorobromomethane	µg/L	7.4	--	14	--	--	CTR
Dissolved Oxygen	mg/L	--	--	[9]	[9]	--	BP
Electrical Conductivity @ 25°C	µmhos/ cm	1,300[10]	--	--	--	--	PB
Flow	MGD	--	--	55	--	--	PF
Methylmercury	grams	13[11]	--	--	--	--	BP
Nitrate + Nitrite (as N)	mg/L	10	--	--	--	--	MCL
pH	S.U.	--	--	--	6.5	8.5	BP, PB
Total Suspended Solids	mg/L	10	15	20	--	--	TTC
	lbs/day[2]	4600	6900	9200	--	--	

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 CFR Part 133.
BP – Based on water quality objectives contained in the Basin Plan.
CTR – Based on water quality criteria contained in the California Toxics Rule and applied as specified in the SIP.
NAWQC – Based on USEPA's National Ambient Water Quality Criteria for the protection of freshwater aquatic life.
SEC MCL – Based on the Secondary Maximum Contaminant Level.
TMDL – Based on the TMDL for salinity and boron in the lower San Joaquin River.
MCL – Based on the Primary Maximum Contaminant Level.
Title 22 – Based on CA Department of Public Health Reclamation Criteria, CCR, Division 4, Chapter 3 (Title 22).

[2] Based upon an average dry weather flow of 55 MGD.

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

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

[5] $$S_{AMEL} = \frac{C_{D-avg}}{0.08} + \frac{C_{C-avg}}{0.012} \leq 1.0$$

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

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

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

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

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

[9] The Discharger shall maintain a minimum daily average effluent DO concentration of 6.0 mg/L from 1 September through 30 November and 5.0 mg/L from 1 December through 31 August.
~~Average daily dissolved oxygen shall not be less than 5 mg/L.~~

[10] Applied as a calendar annual average.

[11] The total calendar annual load of methylmercury shall not exceed 13 grams.

E. Interim Effluent Limitations

The State Water Board's Resolution 2008-0025 "*Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits*" (Compliance Schedule Policy) requires the Central Valley Water Board to establish interim numeric effluent limitations in this Order for compliance schedules longer than 1 year. As discussed in section VI.B.~~7~~6 of this Fact Sheet, the Central Valley Water Board is approving a compliance schedule longer than 1 year for the effluent limitations for methylmercury and nitrate plus nitrite (as N). The Compliance Schedule Policy requires that interim effluent limitations must be based on current treatment plant performance or existing permit limitations, whichever is more stringent.

The interim effluent limitations for mercury and nitrate plus nitrite are based on Facility performance.

1. **Compliance Schedule for Mercury.** The permit limitations for methylmercury are more stringent than the limitations previously imposed. These new limitations are based on the Basin Plan's Delta Mercury Control Program that became effective on 20 October 2011. The Discharger has complied with the application requirements in paragraph 4 of the State

Water Board's Compliance Schedule Policy, and the Discharger's application demonstrates the need for additional time to implement actions to comply with the new limitations, as described below. Therefore, a compliance schedule for compliance with the effluent limitations for methylmercury is established in this Order.

A compliance schedule is necessary because the Discharger must implement actions, including a Phase 1 Methylmercury Control Study and possible facility upgrades to comply with the final effluent limitations.

The Discharger has made diligent efforts to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream, and the results of those efforts. The Discharger is currently implementing a pollution prevention plan for mercury that was submitted to the Central Valley Water Board on ~~19 December 2007~~8 June 2009.

The compliance schedule is as short as possible. The Central Valley Water Board will use the Phase 1 Control Studies' results and other information to consider amendments to the Delta Mercury Control Program during the Phase 1 Delta Mercury Control Program Review. Therefore, at this time it is uncertain what measures must be taken to consistently comply with the waste load allocation for methylmercury. The interim effluent limits and final compliance date may be modified at the completion of Phase 1.

Interim performance-based limitations have been established in this Order in accordance with the Delta Mercury Control Program. The interim limitations were determined as described in section IV.E.2, below, and are in effect until the final limitations take effect.

2. **Interim Limits for Total Mercury.** During Phase 1, the Delta Mercury Control Program requires POTWs to limit their discharges of inorganic (total) mercury to facility performance-based levels. The interim inorganic (total) mercury effluent mass limit is to be derived using current, representative data and shall not exceed the 99.9th percentile of 12-month running effluent inorganic (total) mercury loads (lbs/year). At the end of Phase 1, the interim inorganic (total) mercury mass limit will be re-evaluated and modified as appropriate. The Delta Mercury Control Program also requires interim limits established during Phase 1 and allocations will not be reduced as a result of early actions that result in reduced inorganic (total) mercury and/or methylmercury in discharges.

   The interim limitations for total mercury in this Order are based on the current treatment plant performance. In developing the interim limitation, where there are 10 sampling data points or more, sampling and laboratory variability is accounted for by establishing interim limits that are based on normally distributed data where 99.9 percent of the data points lie within 3.3 standard deviations of the mean (Basic Statistical Methods for Engineers and Scientists, Kennedy and Neville, Harper and Row). Therefore, the 99.9th percentile was determined using the mean plus 3.3 standard deviations of the available data.

   Total mercury effluent data collected from January 2009 through December 2012 was used to determine the performance-based interim effluent limitations. 12-month running mercury loads were calculated, the average and standard deviation of the 12-month running mercury loads were determined and used to calculate the 99.9th percentile.

   The Central Valley Water Board finds that the Discharger can undertake source control and treatment plant measures to maintain compliance with the interim limitations included in this Order. Interim limitations are established when compliance with final effluent limitations cannot be achieved by the existing discharge. Discharge of constituents in concentrations

in excess of the final effluent limitations, but in compliance with the interim effluent limitations, can significantly degrade water quality and adversely affect the beneficial uses of the receiving stream on a long-term basis. The interim limitations, however, establish an enforceable ceiling concentration until compliance with the effluent limitation can be achieved.

The following table ~~summarized~~ summarizes the calculations of the interim effluent limitations for total mercury based on the Facility's current performance (January 2009 thru December 2012). Since the Discharger upgraded the Facility to tertiary filtration in September 2006, only total mercury data collected between August 2004 and July 2005, which is consistent with the date range used in the development of wasteload allocation for this Facility in the Sacramento-San Joaquin Delta Methylmercury TMDL, is used to calculate the performance-based interim limit established in this Order and is therefore consistent with the intent of the TMDL to not penalize dischargers for early actions to reduce mercury. **Effective immediately, and until 31 December 2030,** the effluent calendar annual total mercury load shall not exceed 217 grams. These interim effluent limitations shall apply in lieu of the final effluent limits for methylmercury.

Table F-16. Interim Mercury Effluent Limitation Calculation Summary

Parameter	Units	Maximum Annual Effluent Loading	Mean	Standard Deviation	Number of Samples	Interim Limitation
Mercury, Total Recoverable	g/year	44.6	31.1	7.6	49	57[1]

[1] The interim total mercury limitation has been established as 217 g/year, as discussed in preceding paragraph.

3. **Interim Limits for Nitrate plus Nitrite, as N.** The interim effluent limitation for nitrate plus nitrite consists of a statistically-calculated performance-based ~~AMEL~~ MDEL derived using sample data provided by the Discharger. The interim effluent limitation was developed using the statistical approach provided in the TSD. The TSD provides guidance on estimating the projected maximum effluent concentration using a lognormal distribution of the observed effluent concentrations at a desired confidence level, as detailed in Section 3.3 of the TSD. The multipliers in Table 3-1of the TSD were used to calculate the 99th percent confidence level and 99th percentile of the dataset based on the number of effluent samples and the coefficient of variation. The multipliers from the table were multiplied by the highest observed effluent concentration to estimate the maximum expected effluent concentration; this value was used as the interim ~~AMEL~~MDEL.

Table F-17. Interim Nitrate Plus Nitrite (as N) Effluent Limitation Calculation Summary

Parameter	Units	Maximum Effluent Concentration	Mean	Standard Deviation	Number of Samples	CV	Multiplier	Interim Limitation
Nitrate + Nitrite, as N	mg/L	23.2	18.0	3.88	216	0.28	1.08	31

F. Land Discharge Specifications

~~The Land Discharge Specifications are necessary to protect the beneficial uses of the groundwater.~~ Not Applicable

G. Recycling Specifications

~~Treated wastewater discharged for reclamation is regulated under separate waste discharge requirements and must meet the requirements of CCR, Title 22.~~ 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, suspended sediment, settleable substances, suspended material, tastes and odors, ~~temperature,~~ toxicity, and turbidity. This Order also includes receiving surface water limitations for temperature based on the State Water Board's Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Waters and Enclosed Bays and Estuaries of California (Thermal Plan).

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. Total dissolved solids, which were found to be present in the wastewater at an average concentration of 604 mg/L, have the potential to degrade groundwater quality at this site because there is little ability for attenuation in the shallow permeable vadose zone beneath this Facility. According to Ayers and Westcot, dissolved solids can cause yield or vegetative

growth reductions of sensitive crops if present in excess of 450 mg/L in irrigation water, thereby impairing agricultural use of the water resource. The applicable water quality objective to protect the agricultural use from discharges of total dissolved solids is the narrative Chemical Constituents objective, which is applied following the "Policy of Application of Water Quality Objectives" in the Basin Plan. A numerical groundwater limitation of 450 mg/L for total dissolved solids, based on Ayers and Westcot, is appropriate to apply the narrative Chemical Constituents objective to protect the unrestricted agricultural use of groundwater in the absence of information to support a less protective limit.

4. Nitrate, which was found to be present in the wastewater at an average concentration of up to 18 mg/L as nitrogen, has the potential to degrade groundwater quality because there is little ability for attenuation in the shallow permeable vadose zone beneath the Facility. Furthermore, groundwater monitoring data show nitrate concentrations above the primary MCL of 10 mg/L in monitoring well MW-10~~s MW-3 and MW-5~~. The Chemical Constituents objective prohibits concentrations of chemical constituents in excess of California MCLs in groundwater that is designated as municipal or domestic supply. The California primary MCL for nitrate is equivalent to 10 mg/L as nitrogen, and groundwater beneath the facility is designated as municipal or domestic supply. It is therefore appropriate to adopt a numerical groundwater limitation of 10 mg/L for nitrate as nitrogen to implement the Chemical Constituents objective to protect the municipal and domestic use of groundwater.

5. pH, which ranged ~~6.2~~6.5 to ~~7.3~~7.6 standard units in the domestic wastewater, has the ability to degrade groundwater quality at this site because there is little potential for buffering in the shallow permeable vadose zone. According to Ayers and Westcot, pH less than 6.5 or greater than 8.4 can cause yield or vegetative growth reductions of sensitive crops if present in irrigation water, thereby impairing agricultural use of the water resource. The applicable water quality objective to protect the agricultural use from discharges of substances that affect pH is the narrative Chemical Constituents objective, which is applied following the "Policy of Application of Water Quality Objectives" in the Basin Plan. A numerical groundwater limitation range of 6.5 to 8.4 for pH, based on Ayers and Westcot, is relevant and appropriate to apply the narrative Chemical Constituents objective to protect unrestricted agricultural use of groundwater in the absence of information to support a less protective limit.

~~6. Ammonia has the potential to degrade groundwater quality because there is little ability for ammonia attenuation in the shallow permeable vadose zone at this site. According to Amoore and Hautala[4], who evaluated odor of ammonia in water, the odor threshold for ammonia in water is 1.5 mg/L (as NH_4). These authors studied the concentration of chemicals in air that caused adverse odors and then calculated the concentration in water that would be equivalent to that amount in air. Therefore, it is appropriate to use the data contained therein to apply the narrative Tastes and Odors water quality objective. Concentrations that exceed this value can impair the municipal or domestic use of the resource by causing adverse odors. The applicable water quality objective to protect the municipal and domestic use from discharges of odor producing substances is the narrative Tastes and Odors objective, which is applied following the "Policy of Application of Water Quality Objectives" in the Basin Plan. A numerical groundwater limitation of 1.5 mg/L for ammonia (as NH_4), based on Amoore and Hautala, is relevant and appropriate to apply the~~

~~[4] Amoore, J.E. and E. Hautala. *Odor as an Aid to Chemical Safety: Odor Thresholds Compared with Threshold Limit Values and Volatilities for 214 Industrial Chemicals in Air and Water Dilution*. Journal of Applied Toxicology, Vol. 3, No. 6, (1983).~~

~~narrative Tastes and Odors objective to protect the municipal and domestic use of groundwater.~~

~~7.~~6. 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 a 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. **Pollution Prevention.** This Order requires the Discharger ~~prepare~~ implement pollution prevention plans following Water Code section 13263.3(d)(3) for mercury, nitrate plus nitrite (as N) and salinity. This reopener provision allows the Central Valley Water Board to reopen this Order for addition and/or modification of effluent limitations and requirements for these constituents based on a review of the pollution prevention plans.

c. **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.

d. **Water Effects Ratio (WER) and Metal Translators.** A default WER of 1.0 has been used in this Order for calculating CTR criteria for applicable priority pollutant inorganic constituents. 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.

2. Special Studies and Additional Monitoring Requirements

i. **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 December 2008 through October 2012, the discharge has reasonable potential to cause or contribute to an in-stream excursion above of the Basin Plan's narrative toxicity objective.

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

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

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

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

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

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

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

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

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

- Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Samples Exhibiting Acute and Chronic Toxicity, Second Edition, EPA/600/R-92/080, September 1993.

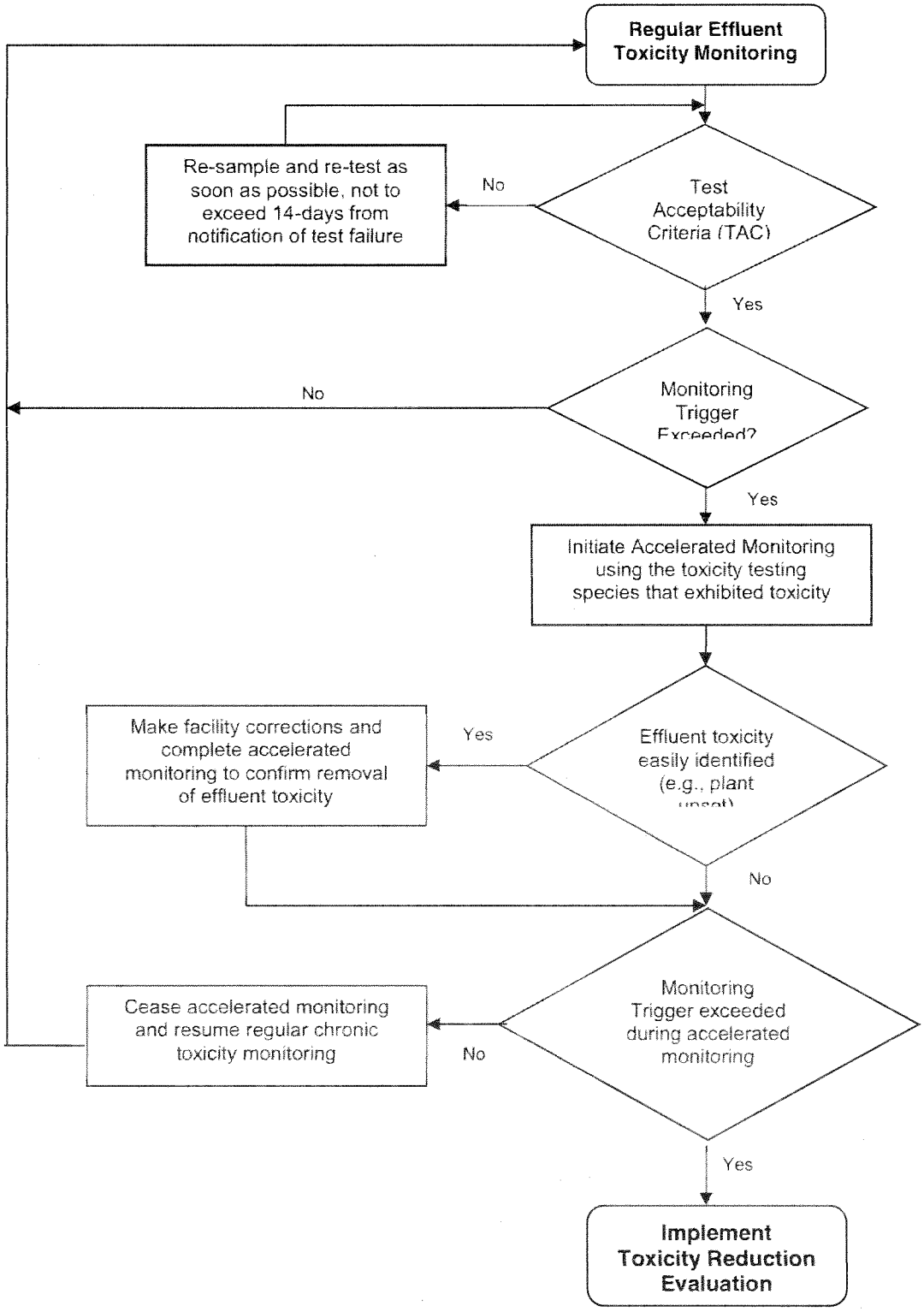
- Methods for Aquatic Toxicity Identification Evaluations: Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity, Second Edition, EPA 600/R-92/081, September 1993.

- Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, Fifth Edition, EPA-821-R-02-012, October 2002.

- Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition, EPA-821-R-02-013, October 2002.

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

Figure F-1
WET Accelerated Monitoring Flow Chart



ii. **Groundwater Monitoring.** The Facility maintains a network of 21 active monitoring wells that are sampled quarterly or semi-annually. The locations of the Facilities monitoring wells east and west of the San Joaquin River are shown in Attachment C. Condor Earth Technologies, Inc. (Condor) recently completed a *Background Groundwater Quality Characterization Technical Report for the City of Stockton Regional Wastewater Control Facility (March 2013).* Groundwater monitoring for the study included approximately 13,000 data points evaluated for 28 constituents over a period of 9 years. Evaluation of the data indicates background groundwater conditions were exceeded with respect to nitrate (as N) at MW-10 and salinity, possibly boron, at MW-12. The Discharger must continue to monitor groundwater as specified in this Order.

iii. **Best Practical Treatment or Control (BPTC).** If the groundwater monitoring results show that the discharge of waste is threatening to cause or has caused groundwater to contain waste constituents in concentrations statistically greater than background water quality, the Discharger shall submit, by **31 December 2014**, a BPTC Evaluation Work Plan. This work plan shall set forth a scope and schedule for a systematic and comprehensive technical evaluation of each component of the Facility's waste management system to determine best practicable treatment or control for each of the waste constituents of concern. The work plan shall include a preliminary evaluation of each component of the waste management system and propose a time schedule for completing the comprehensive technical evaluation. ~~The schedule to complete the evaluation shall be as short as practicable, and shall not exceed one year.~~

3. Best Management Practices and Pollution Prevention

i. **Water Code Section 13263.3(d)(3) Pollution Prevention Plans.** A pollution prevention plan for mercury, nitrate plus nitrite, and salinity is required in this Order per Water Code section 13263.3(d)(1)(C). The pollution prevention plans required in section VI.C.3 and in section VI.C.7 of this Order, shall, at a minimum, meet the requirements outlined in Water Code section 13263.3(d)(3). The minimum requirements for the pollution prevention plans include the following:

i. An estimate of all of the sources of a pollutant contributing, or potentially contributing, to the loadings of a pollutant in the treatment plant influent.

ii. An analysis of the methods that could be used to prevent the discharge of the pollutants into the Facility, including application of local limits to industrial or commercial dischargers regarding pollution prevention techniques, public education and outreach, or other innovative and alternative approaches to reduce discharges of the pollutant to the Facility. The analysis also shall identify sources, or potential sources, not within the ability or authority of the Discharger to control, such as pollutants in the potable water supply, airborne pollutants, pharmaceuticals, or pesticides, and estimate the magnitude of those sources, to the extent feasible.

iii. An estimate of load reductions that may be attained through the methods identified in subparagraph ii.

iv. A plan for monitoring the results of the pollution prevention program.

v. A description of the tasks, cost, and time required to investigate and implement various elements in the pollution prevention plan.

vi. A statement of the Discharger's pollution prevention goals and strategies, including priorities for short-term and long-term action, and a description of the Discharger's intended pollution prevention activities for the immediate future.

vii. A description of the Discharger's existing pollution prevention programs.

viii. An analysis, to the extent feasible, of any adverse environmental impacts, including cross-media impacts or substitute chemicals that may result from the implementation of the pollution prevention program.

ix. An analysis, to the extent feasible, of the costs and benefits that may be incurred to implement the pollution prevention program.

ii. **Mercury Exposure Reduction Program.** The Basin Plan's Delta Mercury Control Program requires dischargers to participate in a Mercury Exposure Reduction Program. The Exposure Reduction Program is needed to address public health impacts of mercury in Delta fish, including activities that reduce actual and potential exposure of and mitigate health impacts to those people and communities most likely to be affected by mercury in Delta caught fish, such as subsistence fishers and their families.

The Exposure Reduction Program must include elements directed toward:

i. Developing and implementing community-driven activities to reduce mercury exposure;

ii. Raising awareness of fish contamination issues among people and communities most likely affected by mercury in Delta-caught fish such as subsistence fishers and their families;

iii. Integrating community-based organizations that serve Delta fish consumers, Delta fish consumers, tribes, and public health agencies in the design and implementation of an exposure reduction program;

iv. Identifying resources, as needed, for community-based organizations and tribes to participate in the Program;

v. Utilizing and expanding upon existing programs and materials or activities in place to reduce mercury, and as needed, create new materials or activities; and

vi. Developing measures for program effectiveness.

This Order requires the Discharger participate in a Mercury Exposure Reduction Program (MERP) in accordance with the Delta Mercury Control Program. By letter dated ~~15 July~~28 August 2013, the Discharger elected to provide financial support in the collective MERP with other Delta dischargers, rather than be individually responsible for any MERP activities. The objective of the Exposure Reduction Program is to reduce mercury exposure of Delta fish consumers most likely affected by mercury. The work plan shall address the Exposure Reduction Program objective, elements, and the Discharger's coordination with other stakeholders. The Discharger shall integrate or, at minimum, provide good-faith opportunities for integration of community-based organizations, tribes, and consumers of Delta fish into planning, decision making, and implementation of exposure reduction activities. The Discharger shall continue to participate in the group effort to implement the work plan.

iii. **Pollution Prevention Plan for Salinity.** ~~An Evaluation and Minimization Plan~~ A Pollution Prevention Plan for salinity is required in this Order to ensure adequate measures are developed and implemented by the Discharger to reduce the discharge of salinity to the San Joaquin River.

4. Construction, Operation, and Maintenance Specifications

i. The operation and maintenance specifications for the treatment ponds are necessary to protect the beneficial uses of the groundwater. The specifications included in this Order are retained from R5-2008-0154. In addition, reporting requirements related to use of the treatment ponds are required to monitor their use and the potential impact on groundwater.

5. Special Provisions for Municipal Facilities (POTWs Only)

i. **Pretreatment Requirements.**

i. The federal CWA section 307(b), and federal regulations, 40 CFR 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 CFR 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.

ii. The State Water Board issued General Waste Discharge Requirements for Sanitary Sewer Systems, Water Quality Order 2006-0003-DWQ (General Order) on May 2, 2006. The Monitoring and Reporting Requirements for the General Order were amended by Water Quality Order WQ 2008-0002-EXEC on February 20, 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. The Discharger has applied for and has been approved for coverage under Order 2006-0003-DWQ for operation of its wastewater collection system.

~~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 December 1, 2006.~~

6. Compliance Schedules

In general, an NPDES permit must include final effluent limitations that are consistent with CWA section 301 and with 40 C.F.R. section 122.44(d). There are exceptions to this general rule. The State Water Board adopted the *Policy for Compliance Schedules in National Pollutant Discharge Elimination System Permits* (Resolution 2008-0025), which is the governing policy for compliance schedules in NPDES permits (hereafter "Compliance Schedule Policy"). The Compliance Schedule Policy allows compliance schedules for new, revised, or newly interpreted water quality objectives or criteria, or in accordance with a TMDL. All compliance schedules must be as short as possible, and may not exceed 10 years from the effective date of the adoption, revision, or new interpretation of the applicable water quality objective or criterion, unless a TMDL allows a longer schedule. Where a compliance schedule for a final effluent limitation exceeds 1 year, the Order must include interim numeric effluent limitations for that constituent or parameter, interim requirements and dates toward achieving compliance, and compliance reporting within 14 days after each interim date. The Order may also include interim requirements to control the pollutant, such as pollutant minimization and source control measures.

In accordance with the Compliance Schedule Policy and 40 CFR 122.47, a Discharger who seeks a compliance schedule must demonstrate additional time is necessary to implement actions to comply with a more stringent permit limitation. The Discharger must provide the following documentation as part of the application requirements:

- Diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream, and the results of those efforts;
- Source control efforts are currently underway or completed, including compliance with any pollution prevention programs that have established;
- A proposed schedule for additional source control measures or waste treatment;
- Data demonstrating current treatment facility performance to compare against existing permit effluent limits, as necessary to determine which is the more stringent interim, permit effluent limit to apply if a schedule of compliance is granted;
- The highest discharge quality that can reasonably be achieved until final compliance is attained;
- The proposed compliance schedule is as short as possible, given the type of facilities being constructed or programs being implemented, and industry experience with the time typically required to construct similar facilities or implement similar programs; and
- Additional information and analyses to be determined by the Regional Water Board on a case-by-case basis.

Based on information submitted with the infeasibility analyses, the Report of Waste Discharge, self-monitoring reports, pollution prevention plans, and other miscellaneous submittals, it has been demonstrated to the satisfaction of the Central Valley Water Board that the Discharger needs time to implement actions to comply with the new effluent limitations for methylmercury and nitrate plus nitrite.

a. **Compliance Schedule for Methylmercury.** The Delta Mercury Control Program is composed of two phases. Phase 1 spans from 20 October 2011 through the Phase I Delta Mercury Control Program Review, expected to conclude by October 2020. Phase 1 emphasizes studies and pilot projects to develop and evaluate management

practices to control methylmercury. Phase 1 includes provisions for: implementing pollution minimization programs and interim mass limits for inorganic (total) mercury point sources in the Delta and Yolo Bypass; controlling sediment-bound mercury in the Delta and Yolo Bypass that may become methylated in agricultural lands, wetland, and open-water habitats; and reducing total mercury loading to San Francisco Bay, as required by the Water Quality Control Plan for the San Francisco Bay Basin.

At the end of Phase 1, the Central Valley Water Board will conduct a Phase 1 Delta Mercury Control Program Review that considers: modification of methylmercury goals, objectives, allocations and/or the Final Compliance Date; implementation of management practices and schedules for methylmercury controls; and adoption of a mercury offset program for dischargers who cannot meet their load and waste load allocations after implementing all reasonable load reduction strategies. The review also will consider other potential public and environmental benefits and negative impacts (e.g., habitat restoration, flood protection, water supply, fish consumption) of attaining the allocations. The fish tissue objectives, the linkage analysis between objectives and sources, and the attainability of the allocations will be re-evaluated based on the findings of Phase 1 control studies and other information. The linkage analysis, fish tissue objectives, allocations, and time schedules shall be adjusted at the end of Phase 1, or subsequent program reviews, if appropriate.

Phase 2 begins after the Phase 1 Delta Mercury Control Program Review or by 20 October 2022, whichever occurs first, and ends in 2030. During Phase 2, dischargers shall implement methylmercury control programs and continue inorganic (total) mercury reduction programs. Compliance monitoring and implementation of upstream control programs also shall occur in Phase 2. Any compliance schedule contained in an NPDES permit must be "*...an enforceable sequence of actions or operations leading to compliance with an effluent limitation...*" per the definition of a compliance schedule in CWA Section 502(17). *See also* 40 C.F.R. § 122.2 (definition of schedule of compliance). The compliance schedule for methylmercury meets these requirements.

Federal Regulations at 40 C.F.R. § 122.47(a)(1) requires that, "*Any schedules of compliance under this section shall require compliance as soon as possible...*" The Compliance Schedule Policy also requires that compliance schedules are as short as possible and may not exceed 10 years, except when "*...a permit limitation that implements or is consistent with the waste load allocations specified in a TMDL that is established through a Basin Plan amendment, provided that the TMDL implementation plan contains a compliance schedule or implementation schedule.*" As discussed above, the Basin Plan's Delta Mercury Control Program includes compliance schedule provisions and allows compliance with the waste load allocations for methylmercury by 2030. Until the Phase 1 Control Studies are complete and the Central Valley Water Board conducts the Phase 1 Delta Mercury Control Program Review, it is not possible to determine the appropriate compliance date for the Discharger that is as soon as possible. Therefore, this Order establishes a compliance schedule for the new, final, WQBELs for methylmercury with full compliance required by **31 December 2030**, which is consistent with the Final Compliance Date of the TMDL. At completion of the Phase 1 Delta Mercury Control Program Review, the final compliance date for this compliance schedule will be re-evaluated to ensure compliance is required as soon as possible. Considering the

available information, the compliance schedule is as short as possible in accordance with federal regulations and the Compliance Schedule Policy.

The compliance schedule for methylmercury is included in Special Provisions section VI.B.6.

b. **Compliance Schedule for Nitrate Plus Nitrite (as N).** The permit limitations for nitrate plus nitrite are more stringent than the limitations previously implemented. These new limitations are based on a new interpretation of a narrative objective. The Discharger has complied with the application requirements in paragraph 4 of the Compliance Schedule Policy, and the Discharger's infeasibility analysis demonstrates the need for additional time to implement actions to comply with the new limitations. Therefore, a compliance schedule for compliance with final effluent limitations for nitrate plus nitrite is established in this Order.

A compliance schedule is necessary because the Discharger must implement actions, including design and construction of facilities to provide denitrification, to comply with the more stringent effluent limitations.

The Discharger has made diligent efforts to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream, and has documented the results of those efforts. The Discharger has collected routine monitoring for nitrate (once per week). The source of nitrate plus nitrite is from domestic sewage and the biological treatment system.

The compliance schedule is as short as possible. The Discharger needs time to design, fund, and construct the necessary facilities to achieve compliance with the effluent limitations for nitrate plus nitrite, and the compliance schedules and interim milestones in this Order are as short as possible given the type of facilities being constructed and industry experience with the time typically required to construct similar facilities.

VII. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 122.48 of 40 C.F.R. 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 (MRP), Attachment E, establishes monitoring and reporting 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.

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., $CBOD_5$ and TSS reduction requirements). The monitoring frequencies for flow (continuous), pH (continuous), electrical conductivity (monthly) and total dissolved solids (monthly) have been retained from Order R5-2008-0154. The monitoring frequencies for $CBOD_5$ and TSS have been reduced from daily to weekly to be consistent with other similar POTWs.

B. Effluent Monitoring

1. Pursuant to the requirements of 40 CFR 122.44(i)(2) effluent monitoring is required for all constituents with effluent limitations. Effluent monitoring is necessary to assess compliance

with effluent limitations, assess the effectiveness of the treatment process, and to assess the impacts of the discharge on the receiving stream and groundwater.

2. Effluent monitoring frequencies and sample types for flow (continuous), total residual chlorine (continuous), sodium bisulfite (daily), sulfur dioxide (daily), temperature (continuous), turbidity (continuous), pH (continuous), dissolved oxygen (daily), nitrate (weekly), nitrite (weekly), electrical conductivity (weekly), mercury (monthly), methylmercury (monthly), chlorodibromomethane (monthly), dichlorobromomethane (monthly), hardness (monthly), chronic toxicity (quarterly) have been retained from Order R5-2008-0154 to determine compliance with effluent limitations for these parameters. The monitoring frequencies for $CBOD_5$, TSS, total coliform organisms, and ammonia have been reduced from daily to 3 times weekly to be consistent with other similar POTWs. The monitoring frequency for total dissolved solids was reduced from weekly to monthly, ~~bis-2(ethylhexyl)phthalate was reduced from monthly to quarterly~~ and acute toxicity was reduced from weekly to monthly, which is sufficient to comply with the effluent limitations in this order.

3. Monitoring data collected over the previous permit term for settleable solids, total kjeldahl nitrogen, oil and grease, total organic carbon, aluminum, bis-2(ethylhexyl)phthalate, cyanide, manganese, molybdenum, standard minerals and alkalinity did not demonstrate reasonable potential to exceed water quality objectives/criteria. Thus, specific monitoring requirements for these parameters have not been retained from Order R5-2008-0154.

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

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

C. Whole Effluent Toxicity Testing Requirements

1. **Acute Toxicity.** 96-hour bioassay testing is required to demonstrate compliance with the effluent limitation for acute toxicity.

2. **Chronic Toxicity.** Quarterly 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.

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 continue 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.~~6~~5.~~a~~b. of this

Order. Biosolids disposal requirements are imposed pursuant to 40 CFR Part 503 to protect public health and prevent groundwater degradation.

2. **Water Supply Monitoring**
Water supply monitoring is required to evaluate the source of constituents in the wastewater.

3. **Pond Monitoring**
Treatment pond monitoring is required to ensure proper operation of the storage pond. Weekly monitoring for freeboard, pH, ~~electrical conductivity,~~ and dissolved oxygen ~~and daily monitoring for odors~~ has been retained from Order R5-2008-0154.

4. **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 Resources Control Board (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 the City of Stockton's Regional Wastewater Quality Facility. 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 publication of a Notice of Public Hearing in The Record on 2 April 2014, ~~the following <Describe Notification Process (e.g., newspaper name and date)>~~

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_decisions/tentative_orders/index.shtml

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 above 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 25 April 2014~~<Date>~~.

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:	**5/6 June 2014**
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 (916) 464-3291.

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 Kari Holmes at 916.464.4843.

ATTACHMENT G – SUMMARY OF REASONABLE POTENTIAL ANALYSIS FOR CONSTITUENTS OF CONCERN

Constituent	Units	MEC/ MOEC	B	C	CMC	CCC	Water & Org	Org. Only	Basin Plan	MCL	Reasonable Potential
Aluminum	µg/L	350	2000	200	750	750	N/A	N/A	N/A	200	No
Ammonia (as N)	mg/L	10.6	N/A	--	--	--	--	--	--	--	Yes
Bis(2-Ethylhexyl)Phthalate	µg/L	1.04	1.5	1.8	N/A	N/A	1.8	5.9	N/A	4	No
Bromoform[1]	µg/L	18	0.5	4.3	N/A	N/A	4.3	360	N/A	N/A	Yes
Copper (total recoverable)	µg/L	2.5	3.4	3.9	5.3	3.9	1300	N/A	N/A	N/A	No
Chlorodibromomethane[2]	µg/L	28	0.049	0.41	N/A	N/A	0.41	34	N/A	80	Yes
Chlorpyrifos	µg/L	ND	0.017	0.1	0.02	0.014	N/A	N/A	0.1	N/A	Insufficient Data
Cyanide	µg/L	4.8	2	5.2	22	5.2	700	220000	N/A	150	No
Diazinon	µg/L	ND	0.01	0.015	0.08	0.05	N/A	N/A	0.015	N/A	Indeterminate[5] Insufficient Data
Dichlorobromomethane[2]	µg/L	14	0.031	0.56	N/A	N/A	0.56	46	N/A	80	Yes
Dissolved Oxygen[3]	mg/L	6.3[4]	--	--	--	--	--	--	5	--	No
Electrical Conductivity@25°C	µmohs/cm	1182	1000	[5]	--	--	--	--	--	--	Indeterminate[5]
Manganese	µg/L	32	100	50	N/A	N/A	N/A	100	N/A	50	No
Mercury (total recoverable)	ng/L	0.003	0.01	2	N/A	N/A	N/A	N/A	N/A	2	Yes
Methylmercury[6]	ng/L	0.17	N/A	--	--	--	--	--	13	--	Yes
Molybdenum	µg/L	7.7	N/A	10	--	--	--	--	--	--	No
Nitrate + Nitrite (as N)	mg/L	28	3.3	10	N/A	N/A	N/A	N/A	N/A	10	Yes
Selenium	µg/L	4.1	1.8	5	20	5	170	4200	N/A	50	No

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

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

Footnotes:
(1) Based on dilution credit of 8:1 and ambient upstream assimilative capacity.
(2) Based on dilution credit of 13:1 and ambient upstream assimilative capacity.
(3) Dissolved oxygen concentrations shall not be reduced below 6.0 mg/L from 1 September through 30 November and 5.0 mg/L from 1 December through 31 August. ~~5 mg/L.~~
(4) Minimum effluent average daily dissolved oxygen concentration.
(5) See Section IV.C.3.c of the Fact Sheet (Attachment F).
(6) The total calendar annual load of methylmercury shall not exceed 13 grams.

ATTACHMENT H – CALCULATION OF WQBELS

Parameter	Units	Most Stringent Criteria			Dilution Factors			HH Calculations			Aquatic Life Calculations									Final Effluent Limitations	
		HH	CMC	CCC	HH	CMC	CCC	ECA_{HH} = $AMEL_{HH}$	AMEL/MDEL $Multiplier_{HH}$	$MDEL_{HH}$	ECA $Multiplier_{acute}$	LTA_{acute}	ECA $Multiplier_{chronic}$	$LTA_{chronic}$	Lowest LTA	AMEL $Multiplier_{95}$	$AMEL_{AL}$	MDEL $Multiplier_{99}$	$MDEL_{AL}$	Lowest AMEL	Lowest MDEL
Ammonia (as N) – (April 1 – October 31)	mg/L	--	7.68	1.28	--	-	-	--	--	--	0.22	1.7	0.69	0.89	0.89	1.29	1.2	4.5	4.3	1.2	4.0
Ammonia (as N) – (November 1 – November 31)	mg/L	--	17.5	2.7	--	-	-	--	--	--	0.16	2.9	0.60	1.62	1.62	1.42	2.3	6.1	9.9	2.3	9.9
Ammonia (as N) – (December 1 – March 31)	mg/L	--	17.6	2.73	--	-	-	--	--	--	0.18	3.1	0.63	1.71	1.71	1.38	2.4	5.6	5.6	2.4	9.6

Bromoform	µg/L	4.3	--	--	8	-	-	37.4	3.06	115	--	--	--	--	--	--	--	--	--	38	115
Chlorodibromomethane	µg/L	0.41	--	--	13	-	-	5.1	2.71	13.8	--	--	--	--	--	--	--	--	--	5.1	14
Dichlorobromomethane	µg/L	0.56	--	--	13	-	-	7.4	1.91	14.2	--	--	--	--	--	--	--	--	--	7.4	14