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For Petitioner California Sportfishing Protection Alliance

BEFORE THE STATE WATER RESOURCES CONTROL BOARD

In the Matter of Waste Discharge Requirements For City of Davis Wastewater Treatment Plant; California Regional Water Quality Control Board – Central Valley Region Order No. R5-2010-0097; Amended Order No. R5-2007-0132-02; NPDES No. CA0079049	**PETITION FOR REVIEW**

Pursuant to Section 13320 of California Water Code and Section 2050 of Title 23 of the California Code of Regulations (CCR), California Sportfishing Protection Alliance ("CSPA" or "petitioner") petitions the State Water Resources Control Board (State Board) to review and vacate the final decision of the California Regional Water Quality Control Board for

the Central Valley Region ("Regional Board") in adopting Waste Discharge Requirements (NPDES No. CA0079049) for City of Davis Wastewater Treatment Plant, on 23 September 2010. See Order No. R5-2010-0097, Amended Order No. R5-2007-0132-02. The issues raised in this petition were raised in timely written comments.

1. NAME AND ADDRESS OF THE PETITIONERS:

California Sportfishing Protection Alliance
3536 Rainier Avenue
Stockton, California 95204
Attention: Bill Jennings, Executive Director

2. THE SPECIFIC ACTION OR INACTION OF THE REGIONAL BOARDWHICH THE STATE BOARD IS REQUESTED TO REVIEW AND ACOPY OF ANY ORDER OR RESOLUTION OF THE REGIONAL BOARD WHICH IS REFERRED TO IN THE PETITION:

Petitioner seeks review of Order No. R5-2007-0132-02, Waste Discharge Requirements (NPDES No. CA0079049) for the City of Davis Wastewater Treatment Plant. A copy of the adopted Order is attached as Attachment No. 1.

3. THE DATE ON WHICH THE REGIONAL BOARD ACTED OR REFUSED TO ACT OR ON WHICH THE REGIONAL BOARD WAS REQUESTED TO ACT:

23 September 2010

4. A FULL AND COMPLETE STATEMENT OF THE REASONS THE ACTION OR FAILURE TO ACT WAS INAPPROPRIATE OR IMPROPER:

CSPA submitted a detailed comment letter on 1 August 2010. That letter and the following comments set forth in detail the reasons and points and authorities why CSPA believes the Order fails to comport with statutory and regulatory requirements. The specific reasons the adopted Orders are improper are:

The Central Valley Regional Water Board adopted the NPDES permit for the City of Davis on 25 October 2007. The California Sportsfishing Protection Alliance (CSPA) filed a timely petition to the State Water Resources Control Board with the allotted 30-days. Almost a year later, on 2 September 2008, the State Water Resources Control Board adopted Order WQ 2008-0008. A corrected copy of the Order (WQ 2008-0008 corrected) was issued on 15 September

2008 remanding the City of Davis NPDES permit back to the Central Valley Regional Board for correction as follows:

> *"IT IS HEREBY ORDERED THAT, this matter be remanded to the Central Valley Water Board to make revisions to the Permit that are consistent with this order. Specifically, the Central Valley Water Board must do the following:*
>
> *1. Amend the Permit to include a narrative limitation for chronic toxicity such as, "There shall be no chronic toxicity in the effluent discharge."*
>
> *2. Revise the Fact Sheet to include a discussion of the appropriate hardness to use to protect from acute toxicity impacts (which can occur in short-term periods including storm events) in the receiving waters. The Fact Sheet should also state that the lowest valid upstream receiving water hardness values of 78 mg/l for Willow Slough Bypass and 85 mg/l for Conaway Ranch Toe Drain should be used to determine reasonable potential for the effluent to exceed the hardness-dependent metal CTR criteria, unless additional evidence and analysis, consistent with this Order, demonstrates that different hardness values are appropriate to use and are fully protective of water quality.*
>
> *3. Revise the Fact Sheet to indicate that lead, zinc, and nickel do not have the reasonable potential to exceed the applicable hardness-dependent CTR criteria, even using the lowest valid available upstream receiving water hardness value of 78 mg/l for protection of acute toxicity impacts for the Willow Slough Bypass.*
>
> *4. Revise the Fact Sheet to state that the effluent at Conaway Ranch Toe Drain does have reasonable potential to exceed the acute and chronic CTR criteria for copper and effluent limitations are needed for this discharge point, unless additional evidence and analysis, consistent with this Order, demonstrates that reasonable potential does not exist.*
>
> *5. If the Central Valley Water Board determines, pursuant to paragraph #4, that reasonable potential exists for copper, amend the Permit to add acute and chronic effluent limitations for copper, based on the lowest upstream receiving water hardness for the discharge at Conaway Ranch Toe Drain. A compliance time schedule may be added, if necessary.*
>
> *6. Revise the Fact Sheet to state that, based on the lowest upstream receiving water hardness at Willow Slough Bypass, the effluent does not have reasonable potential to exceed the CTR acute water quality criterion for silver, but the effluent at Conaway Ranch Toe Drain does have reasonable potential and an effluent limitation is needed for*

this discharge point, unless additional evidence and analysis, consistent with this Order, demonstrates that reasonable potential does not exist.

7. If the Central Valley Water Board determines, pursuant to paragraph #6, that reasonable potential exists for silver, amend the Permit to add an effluent limitation for silver for the discharge at the Conaway Ranch Toe Drain and include a compliance time schedule if necessary.

8. Review the City of Woodland's EC site-specific study to determine whether it provides an appropriate basis for calculating a final EC effluent limitation for the discharge regulated by the Permit, and if so, amend the Permit as necessary to make the appropriate changes for EC, including the addition of an effluent limitation as appropriate, based on that review. If the City of Woodland study is not used, findings justifying that decision must be made. This portion of the Order may take additional time to complete and may be completed after the revisions required by in sections 1 – 7 are completed."

On 1 July 2010, 22 months later, the Regional Board circulated a tentative NPDES permit addressing the State Board's remand. Our comments regarding the proposed City of Davis NPDES permit revisions are as follows:

A. The Permit allows for a defacto mixing zone absent any mixing zone analysis to an ephemeral stream contrary to the mixing zone requirements contained in the Basin Plan and the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (SIP)* for temperature and turbidity.

The Permit has been modified on page 18 to state that compliance with the Receiving Water Limitations for temperature and turbidity will be determined based on the difference between the upstream and downstream receiving water sampling points.

According to the Monitoring and Reporting Program, Order No. R5-2007-0132-02, page E-2, the Receiving Water sampling locations are:

"001 RSW-001U Willow Slough Bypass, 30 ft upstream of Discharge 001
001 RSW-001D Willow Slough Bypass, 200 ft downstream of Discharge 001
002 RSW-002U Conaway Ranch Toe Drain, 30 ft upstream of Discharge 002
002 RSW-002D Conaway Ranch Toe Drain, 375 ft downstream of Discharge 002**"**

The distance between the locations on Willow Slough Bypass is 230 feet and on Conaway ranch Toe Drain is 405 feet.

The Permit states, on page F-27 that:

> "c**.** Assimilative Capacity/Mixing Zone. The State Water Resources Control Board Water Quality Order (WQO) No. 2002-0015, states that the use of the harmonic mean to determine flow rates is inappropriate for ephemeral streams where there is no consistent background dilution. The impact of considering a receiving stream to be ephemeral is that all limitations are "end of pipe" without any benefit of dilution. Since the receiving streams' flows are, at times, immeasurably small to nonexistent, this Order contains "end of pipe" limitations, with no dilution credits."

In allowing for the point of compliance to be assessed 200 and 375 feet downstream from the point of discharge, the Regional Board is granting a mixing zone for temperature and turbidity contrary to the Finding regarding *Assimilative Capacity/Mixing Zone.*

Mixing zone policies allow a discharger's point of compliance with state and federal water quality standards to be moved from the "end of the pipe" to the outer boundaries of a dilution zone. The area between the point of discharge and the outer boundary of the dilution zone are non-compliant for the applicable objective.

The water quality objectives for temperature and turbidity are contained in the Water Quality Control Plan (Basin Plan) for the Sacramento/San Joaquin River Basins, Water Quality Objectives section. The Basin Plan, page III-2.00, states that the water quality objectives are applicable to all surface waters in the Basin. The objective for temperature goes even further in stating that: "at no place or time shall the temperature of COLD or WARM intrastate waters be increased more than 5 degrees F above natural receiving water temperature. The Permit, in stating that compliance will be determined by determining the difference between the upstream and downstream sampling points, allows the intermediate area to exceed the water quality objectives. There is no physical barrier preventing sampling of the receiving stream at the point of discharge to determine compliance. There is also no reason that temperature and turbidity measured of the wastewater effluent discharge cannot be compared to the temperature and turbidity sampled immediately upstream of the point of discharge, eliminating the granting of a mixing zone.

The Central Valley Regional Water Quality Control Board's Basin Plan, page IV-16.00, requires the Regional Board use EPA's *Technical Support Document for Water Quality Based Toxics Control (TSD)* in assessing mixing zones. The TSD, page 70, defines a first stage of mixing, close to the point of discharge, where complete mixing is determined by the momentum and

buoyancy of the discharge. The second stage is defined by the TSD where the initial momentum and buoyancy of the discharge are diminished and waste is mixed by ambient turbulence. The TSD goes on to state that in large rivers this second stage mixing may extend for miles. The TSD, Section 4.4, requires that if complete mix does not occur in a short distance mixing zone monitoring and modeling must be undertaken.

The State's *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California* (SIP), Section 1.4.2.2, contains requirements for a mixing zone study which must be analyzed before a mixing zone is allowed for a wastewater discharge. Properly adopted state Policy requirements are not optional. The proposed Effluent Limitations in the Permit are not supported by the scientific investigation that is required by the SIP and the Basin Plan.

> SIP Section 1.4.2.2 requires that a mixing zone shall not:
> Compromise the integrity of the entire waterbody.
> Cause acutely toxic conditions to aquatic life.
> Restrict the passage of aquatic life.
> Adversely impact biologically sensitive habitats.
> Produce undesirable aquatic life.
> Result in floating debris.
> Produce objectionable color, odor, taste or turbidity.
> Cause objectionable bottom deposits.
> Cause Nuisance.
> Dominate the receiving water body or overlap a different mixing zone.
> Be allowed at or near any drinking water intake.

The Permit's mixing zones have not addressed a single required item of the Basin Plan or the SIP in allowing a mixing zone for temperature or turbidity. The allowance for a mixing zone has also not been address in an Antidegradation Policy (Resolution 68-16) analysis which would be required as a result of allowing a relaxation from the prescribed Basin Plan objective of all water meeting water quality objectives to an allowance of a mixing zone.

B. Compliance points for Receiving Water Limitations for temperature and turbidity have been modified in the Permit that were not the subject of the State Board's remand back to the Regional Board and are included contrary to the Federal Requirements in federal regulation 40 CFR 122.62(a) which specifies cases for modification of an NPDES permit.

Federal Regulations, 40 CFR 122.62, contains limited reasons why a permit can be reopened and modified. Modification of the Receiving Water Limitations, which was not addressed in the

State Board remand, for temperature and turbidity does not meet any of the tests required to reopen and modify the permit. The Permit does not address the regulatory requirements or standards for reopening and modifying the permit for temperature and turbidity.

C. The Permit Utilizes Translators for Metals that result in discharge limitations that are not protective of the aquatic life beneficial uses of the receiving stream and does not utilize the applicable numeric water quality standard or criteria contrary to federal regulation 40 CFR 122.44(d). The US Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS) biological opinion requires that whenever a threatened or endangered species is present downstream from a discharge where a State developed translator will be used, EPA will work with the permitting authority to ensure that appropriate information, which may be needed to calculate the translator in accordance with the applicable guidance, will be obtained and used. The Regional Board failed to consult with EPA, the US Fish and Wildlife Service and the National Marine Fisheries Service regarding the metals translators.

Section 122.44(d) of 40 CFR requires that permits include water quality-based effluent limitations (WQBELs) to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. The Permit, pages F-16 and F-17, states that: "The site-specific translators for copper, lead, and nickel based on the effluent monitoring data are appropriate for development of end-of-pipe water quality-based effluent limits. Therefore, this Order allows the use of the site-specific metals translators based on the effluent."

The receiving stream, at both discharge points, is either within the Yolo Bypass or immediately enters the Yolo Bypass. The Yolo Bypass has been documented to contain threatened and endangered species.

> "Unlike conventional flood control systems that frequently isolate rivers from ecologically-essential floodplain habitat, California's Yolo Bypass has been engineered to allow Sacramento Valley floodwaters to inundate a broad floodplain. From a flood control standpoint, the 24,000 acre leveed floodplain has been exceptionally successful based on its ability to convey up to 80% of the flow of the Sacramento River basin during high water events. Agricultural lands and seasonal and permanent wetlands within the bypass provide key habitat for waterfowl migrating through the Pacific Flyway. Our field studies demonstrate that the bypass seasonally supports 42 fish species, 15 of which are native. The floodplain appears to be particularly valuable spawning and rearing habitat for the splittail (*Pogonichthys macrolepidotus*), a federally-listed cyprinid, and for young chinook salmon (*Oncorhynchus tshawytscha*), which use the Yolo Bypass as a nursery

area. The system may also be an important source to the downstream food web of the San Francisco Estuary as a result of enhanced production of phytoplankton and detrital material. These results suggest that alternative flood control systems can be designed without eliminating floodplain function and processes, key goals of the 1996 Draft AFS Floodplain Management Position Statement."
(http://afsjournals.org/doi/abs/10.1577/1548-8446%282001%29026%3C0006%3ACYB%3E2.0.CO%3B2?journalCode=fish)
"The Lower Yolo Bypass is the most downstream portion of the Yolo Bypass (Bypass), a massive levied floodway located west of the Sacramento River and within Yolo and Solano Counties. The Bypass provides flood conveyance for the cumulative high flows from several northern California waterways to the Sacramento-San Joaquin River Delta (Delta). In addition to flood conveyance, the Bypass provides critical habitat to a variety of species including numerous plant and bird species and threatened and endangered fish such as the Delta Smelt and Sacramento Splittail. The Bypass also provides recreation opportunities, including widespread hunting and fishing use."
(http://www.delta.ca.gov/yolo.htm, Delta Protection Commission)
"Our results show that the Yolo Bypass provides valuable aquatic habitat to 42 fish species, 15 of which are native (Table 2). Many of these species are year-round residents in perennial waters in the floodplain. The bypass seasonally supports several state and federally-listed species: delta smelt (*Hypomesus transpacificus*), splittail, steelhead trout (*Oncorhyncus mykiss*), and spring-run and winter-run chinook salmon. Popular game fish are also present including white sturgeon (*Acipenser transmontanus*), striped bass (*Morone saxatilis*), largemouth bass (*Micropterus salmoides*), and white crappie (*Pomoxis annularis*)." (Fisheries | www.fisheries.org | vol 26 no 8, http://online.sfsu.edu/~kimmerer/Files/Sommer%20et%20al%202001%20Fisheries.pdf)

"The Sacramento splittail is a cyprinid fish endemic to the Central Valley of California with a range that centers on the San Francisco Estuary. Spawning occurs in flooded vegetation, including the Yolo Bypass, with older fish spawning first. Peak reproduction occurs in March and April though splittail are fractional spawners, so the process may take months." (http://www.fws.gov/cno/press/release.cfm?rid=79)

On March 24, 2000 the US Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS) issued a biological opinion on the effects of the final promulgation of the CTR on listed species and critical habitats in California in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.; Act). The biological opinion was issued to the U.S. Environmental Protection Agency, Region 9, with regard to the "Final Rule for the Promulgation of Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California" (CTR)". The document represented the Services' final biological opinion on the effects of the final promulgation of the CTR on listed

species and critical habitats in California in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.; Act). The biological opinion contained the following discussion with regard to Conversion Factors and Translators.

"Conversion Factors and Translators

EPA derived ambient metals criteria from aquatic toxicity tests that observed the dose-response relationships of test organisms under controlled (laboratory) conditions. In most of these studies, organism responses were plotted against nominal test concentrations of metals or concentrations determined on unfiltered samples. Thus, until recently metals criteria have been expressed in terms of total metal concentrations. Current EPA metals policy (USEPA 1993a) and the CTR in particular propose that criteria be expressed on a dissolved basis because particulate metals contribute less toxicity than dissolved forms. EPA formulas for computing criteria thus are adjusted via a conversion factor (CF), so that criteria based on total metal concentrations can be "converted" to a dissolved basis. Metals for which a conversion factor has been applied include arsenic, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc.

The CF is a value that is used to estimate the ratio of dissolved metals to total recoverable metals to adjust the former criteria based on total metal to yield a dissolved metal criterion. A CF based on the premise that the dissolved fraction of the metals in water is the most bioavailable and therefore the most toxic (USEPA 1993a, 1997c). The presumption is that the dose/response relationships found in toxicity tests would be more precise if "dissolved" metal concentrations were determined in test solution samples that have been filtered to remove the larger-sized, particulate metal fraction. The term "total" metal refers to metal concentrations determined in unfiltered samples that have been acidified (pH < 2) before analysis. The term "dissolved" metal refers to metal concentrations determined in samples that have been filtered (generally a 0.45- micron pore size) prior to acidification and analysis. Although it is clear that concentrations determined in a procedurally-defined dissolved sample are not accurate measures of dissolved metals, it may be premature to recommend immediate changes to the current procedure (Chapman 1998). Particulate metals can be single atoms or metal complexes adsorbed to or incorporated into silt, clay, algae, detritus, plankton, etc., which can be removed from the test water by filtration through a 0.45 micron filter. A CF value is always less than 1 (except for As which is currently 1.0) and is multiplied by a total criterion to yield a (lower) dissolved criterion.

For example, CF values for Cd, Cu, Pb, and Zn, are 0.944, 0.960, 0.791, and 0.978 respectively (USEPA 1997c). The CF values approach 100 percent for several metals because they are ratios determined in laboratory toxicity-test solutions, not in natural waters where relative contributions of waterborne particulate metals are much great er. The California Department of Fish and Game (CDFG 1997) has commented that particulate fractions in natural waters in California are often in the range of 80 percent, which would equate to a dissolved-to-total ratio of 0.2. To convert metals criteria, EPA reviewed test data that reported both total and dissolved concentrations in their test waters and also conducted simulations of earlier experiments to determine the dissolved-to-total ratios (USEPA 1992, 1995a, 1997c). In this way, the historical toxicity database could be preserved and a large number of new toxicity tests would not have to be performed. Overall, the CFs proposed in the CTR are based upon roughly 10% of the historical database of toxicity tests. CF values for As and Ni were based on only 1 study each, comprising 11 records. CF values for Cr were based on only 2 studies, while the estimated CF for Pb was based on 3 studies, comprised of only 3 records. Although additional confirmatory studies were performed to develop the CFs, the database available appears to be limited and calls into question the defensibility of the CFs determined for these metals.

Ultimately the scientifically most defensible derivation of dissolved metals criteria should be based on reviews of new laboratory investigations because:

1. The several water quality variables that modulate metal toxicity may not have been properly controlled, measured, reported, or manipulated over ranges that are environmentally realistic and necessary to consider if site-specific criteria are to be proposed (see section on hardness);

2. It is likely that most toxicity tests measured organism responses in terms of traditional endpoints such as mortality, growth, reproductive output. These may not be sufficient for determining the toxic effects of metals in test waters manipulated to reflect environmental (site) conditions (see section on hardness);

3. The test waters contained very low contributions from particulate metals to the total metal concentrations. These proportions are not environmentally realistic; and

4. The present EPA criteria for metals lack meaningful input and modification from metals toxicity research done in the last decade.

Points 1 and 2 above are discussed in this final biological opinion in the hardness section dealing with the use of water hardness as a general water quality "surrogate". Point 3 is illustrated by the fact that the CF's proposed in the CTR for several metals are near a value of 1.0. This indicates that the toxicity tests reviewed to derive dissolved-based criteria exposed test organisms in waters that contained very low concentrations of particulate metals. For example, the CF values for Cd, Cu, Pb, and Zn, are 0.944, 0.960, 0.791, and 0.978 respectively (USEPA 1997c), meaning that particulate metal percentages were (on average) 5.6%, 4.0%, 20.9%, and 2.2%. These percentages are much lower than found in many natural waters. The California Department of Fish and Game, in their comments to the EPA on the proposed CTR, has stated that particulate fractions in natural waters in California are often in the range of 80 percent (CDFG 1997), which would equate to a dissolved-to-total ratio of 0.2. It is clear that the historical toxicity database does not include studies of the toxic contributions of particulate metals under environmentally realistic conditions. Improved assessments are necessary to develop adequately protective, site specific criteria.

The EPA Office of Water Policy and Technical Guidance has noted that particulate metals contribute some toxicity and that there is considerable debate in the scientific community on this point (USEPA 1993a). While the Services agree that dissolved metal forms are generally more toxic, this is not equivalent to saying that particulate metals are non-toxic, do not contribute to organism exposure, or do not require criteria guidance by the EPA. Few studies have carefully manipulated particulate concentrations along with other water constituents, to determine their role(s) in modulating metals toxicity. Erickson et al. (1996) performed such a study while measuring growth and survival endpoints in fish and suggested that copper adsorbed to particulates cannot be considered to be strictly non-toxic. Playle (1997) cautions that it is premature to dismiss particulate-associated metals as biologically unavailable and recommends the expansion of fish gill-metal interaction models to include these forms. The Service is particularly concerned that investigations have not been performed with test waters that contain both high particulate metal concentrations and dissolved concentrations near the CTR-proposed criteria concentrations.

Despite a paucity of information about the aquatic toxicity of particulate metals, the CTR proposes that compliance would be based on removing (filtering) these contaminants from a sample prior to analysis. It would be prudent to first conduct short-term and longer term studies, as well as tests that expose organisms other than fish. Particulates may act as a sink for metals, but they may also act as a source.

Through chemical, physical, and biological activity these metals can become bioavailable (Moore and Ramamoorthy 1984). Particulate and dissolved metals end up in sediments but are not rendered entirely nontoxic nor completely immobile, thus they still may contribute to the toxicity of the metal in natural waters.

Particulate metals have been removed from the regulatory " equation" through at least two methods: the use of a CF to determine the dissolved metal criteria, and the use of a translator to convert back to a total metal concentration for use in waste load limit calculations. When waste discharge limits are to be developed and TMDLs are determined for a receiving waterbed, the dissolved criterion must be "translated" back to a total concentration because TMDLs will continue to be based on total metals.

EPA provides three methods in which the translation of dissolved criteria to field measurements of total metal may be implemented. These three methods may potentially result in greatly different outcomes relative to particulate metal loading. These methods are:

1. Determination of a site specific translator by measuring site specific ratios of dissolved metal to total metal and then dividing the dissolved criterion by this translator. As an example: a site specific ratio of 0.4 (40% of the metal in the site water is dissolved) would result in a 2.5 fold increase in the discharge of total metal. The higher the fraction of particulate metal in the site water the greater the allowable discharge of total metal. See the discussion and Table 9 below.
This is EPA's preferred method.
2. Theoretical partitioning relationship. This method is based on a partitioning coefficient determined empirically for each metal and when available the concentration of total suspended solids in the site specific receiving water.

3. The translator for a metal is assumed to be equivalent to the criteria guidance conversion factor for that metal (use the same value to convert from total to dissolved and back again).
Since translators are needed to calculate discharge limits they become important in determining the total metals allowed to be discharged (see also loading discussion for individual metals below.

In the economic analysis performed by the EPA and evaluated by the State Board (SWRCB 1997), it was estimated that translators based on site-specific data will decrease dischargers costs of implementing the new CTR criteria by 50 percent. This cost savings is "directly related to the less stringent effluent limitations that result

from the use of site-specific translators." This implies a strong economic incentive for dischargers to reduce costs by developing site-specific translators and ultimately being allowed to discharge more total metals. This conclusion regarding the impact of site specific translators is supported by documents received from EPA (USEPA 1997d).

EPA performed a sensitivity analysis on the effect of the site specific translator, which relies on determining the ratio of metal in water after filtration to metal in water before filtration in downstream waters. EPA's analysis indicated that use of a site-specific translators to calculate criteria would result in greater releases of toxic-weighted metals loads above the option where the Cfs are used as the translators. The potential difference was estimated to be between 0.4 million and 2.24 million "toxic weighted" pounds of metals discharged to California waterways.

The Services believe that the current use of conversion factors and site specific translators in formula-based metal criteria are not sufficiently protective of threatened and endangered aquatic species because:

1. Particulate metals have been removed from the regulatory equation even though chemical, physical, and biological activity can subsequently cause these particulate metals to become bioavailable;

2. The criteria are developed using toxicity tests that expose test organisms to metal concentrations with very low contributions from particulate metals;

3. Toxicity tests do not assess whether the toxic contributions of particulate metals are negligible when particulate concentrations are great and dissolved concentrations are at or near criteria levels;

4. This method has the potential to significantly increase the discharge of total metal loads into the environment even though dissolved metal criteria are being met by a discharger; and

5. The premise ignores the fact that water is more than a chemical medium; it also physically delivers metals to the sediments."

The Services believe that the CTR proposed formula-based metal criteria is not protective of threatened or endangered aquatic species because total metal discharges will likely increase and the criteria development methods do not adequately consider

the environmental fate, transport, and transformation of metals in natural environments.

The US Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS) biological opinion requires that whenever a threatened or endangered species is present downstream from a discharge where a State developed translator will be used, EPA will work with the permitting authority to ensure that appropriate information, which may be needed to calculate the translator in accordance with the applicable guidance, will be obtained and used.

Appropriate information includes:

1. Ambient and effluent acute and chronic toxicity data;
2. Bioassessment data; and/or
3. an analysis of the potential effect s of the metals using sediment guidelines, biocriteria and residue-based criteria for shellfish to the extent such guidelines and criteria exist and are applicable to the receiving water body.

EPA, in cooperation with the Services, will review these discharges and associated monitoring data and permit limits, to determine the potential for the discharge to impact federally listed species and/or critical habitats. If discharges are identified that have the potential to adversely affect federally listed species and/or critical habitat, EPA will work with the Services and the State of California in accordance with procedures agreed to by the Agencies in the draft MOA published in the Federal Register at 64 FR 2755 (January 15, 1999) or any modifications to those procedures agreed to in a finalized MOA."

The Permit states that: "During the study, the Discharger collected water quality data twice a week for a 5-week period during low receiving water conditions, which is recommended by USEPA's guidance. Samples were collected of the effluent at Discharge 001 and in Willow Slough Bypass approximately 3 miles downstream of Discharge 001. Metals translators were developed for copper, nickel, and lead in accordance with the SIP and USEPA's guidance…" First, the Permit does not specify what EPA Guidance was used in development of the translators. EPA's June 1996 *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion* recommends that samples would normally be collected during low flow conditions when where TSS concentrations are fairly consistent. EPA's recommendation to collect samples during low flow conditions relates to "worst case" conditions in most streams, but not necessarily the receiving waters in Davis. As is stated in the Fact Sheet, hardness in Davis' receiving streams vary greatly depending on flood water flows. The lowest hardness values are actually observed during high flows, not low,

corresponding to the worst case for the toxicity of metals. Sampling exclusively during the low flow conditions at Davis does not likely capture the worst case partitioning of metals and is likely inappropriate. The translator study used at Davis is likely significantly flawed.

D. The Permit fails to utilize the latest EPA recommended criteria for copper and instead utilized an outdated water quality standard and water effects ration in developing and effluent limitation for copper contrary to Section 122.44(d) of 40 CFR which requires that permits include water quality-based effluent limitations (WQBELs) to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water.

EPA has issued revised national recommended freshwater aquatic life criteria for copper (*Aquatic Life Ambient Freshwater Quality Criteria—Copper 2007 Revision*). In adopting the copper criteria EPA stated that:

> "Copper is an abundant naturally occurring trace element found in the earth's crust that is also found in surface waters. Copper is a micronutrient at low concentrations and is essential to virtually all plants and animals. At higher concentrations copper can become toxic to aquatic life. Mining, leather and leather products, fabricated metal products, and electric equipment are a few of the industries with copper-bearing discharges that contribute to manmade discharges of copper into surface waters. Municipal effluents may also contribute additional copper loadings to surface waters.
>
> Since EPA published the hardness-based recommendation for copper criteria in 1984, new data have become available on copper toxicity and its effects on aquatic life. The Biotic Ligand Model (BLM) – a metal bioavailability model that uses receiving water body characteristics to develop site-specific water quality criteria – utilizes the best available science and serves as the basis for the new national recommended criteria.
>
> The BLM requires ten input parameters to calculate a freshwater copper criterion (a saltwater BLM is not yet available): temperature, pH, dissolved organic carbon (DOC), calcium, magnesium, sodium, potassium, sulfate, chloride, and alkalinity. The BLM is used to derive the criteria rather than as a post-derivation adjustment as was the case with the hardness-based criteria. This allows the BLM-based criteria to be customized to the particular water under consideration.
>
> BLM-based criteria can be more stringent than the current hardness-based copper criteria and in certain cases the current hardness-based copper criteria may be overly stringent for particular water bodies. We expect that application of this model will result in more

> appropriate criteria and eliminate the need for costly, time-consuming site-specific modifications using the water effect ratio."

On March 24, 2000 the US Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS) issued a biological opinion on the effects of the final promulgation of the CTR on listed species and critical habitats in California in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.; Act). The biological opinion was issued to the U.S. Environmental Protection Agency, Region 9, with regard to the "Final Rule for the Promulgation of Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California" (CTR)". The document represented the Services' final biological opinion on the effects of the final promulgation of the CTR on listed species and critical habitats in California in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.; Act).

On Page 13 (C) and repeated on pages 216 and 232 of the biological opinion it is required that:

> "By June of 2003, EPA, in cooperation with the Services, will develop a revised criteria calculation model based on best available science for deriving aquatic life criteria on the basis of hardness (calcium and magnesium), pH, alkalinity, and dissolved organic carbon (DOC) for metals."

The biological opinion contains the following discussion, beginning on page 205, regarding the use of hardness in developing limitations for toxic metals:

> "The CTR should more clearly identify what is actually to be measured in a site water to determine a site-specific hardness value. Is the measure of hardness referred to in the CTR equations a measure of the water hardness due to calcium and magnesium ions only? If hardness computations were specified to be derived from data obtained in site water calcium and magnesium determinations alone, confusion could be avoided and more accurate results obtained (APHA 1985). Site hardness values would thus not include contributions from other multivalent cations (e.g., iron, aluminum, manganese), would not rise above calcium + magnesium hardness values, or result in greater-than-intended site criteria when used in formulas. In this Biological opinion, what the Services refer to as hardness is the water hardness due to calcium + magnesium ions only.
>
> <u>The CTR should clearly state that to obtain a site hardness value, samples should be collected upstream of the effluent source(s). Clearly stating this requirement in the CTR would avoid the computation of greater-than-intended site criteria in cases where samples were collected downstream of effluents that raise ambient hardness, but not other important water qualities that affect metal toxicity (e.g., pH, alkalinity, dissolved organic carbon, calcium, sodium, chloride, etc.). Clearly, it is inappropriate to use downstream</u>

site water quality variables for input into criteria formulas because they may be greatly altered by the effluent under regulation. Alterations in receiving water chemistry by a discharger (e.g., abrupt elevation of hardness, changes in pH, exhaustion of alkalinity, abrupt increases in organic matter etc.) should not result, through application of hardness in criteria formulas, in increased allowable discharges of toxic metals. If the use of downstream site water quality variables were allowed, discharges that alter the existing, naturally-occurring water composition would be encouraged rather than discouraged. Discharges should not change water chemistry even if the alterations do not result in toxicity, because the aquatic communities present in a water body may prefer the unaltered environment over the discharge-affected environment. Biological criteria may be necessary to detect adverse ecological effects downstream of discharges, whether or not toxicity is expressed.

The CTR proposes criteria formulas that use site water hardness as the only input variable. In contrast, over twenty years ago Howarth and Sprague (1978) cautioned against a broad use of water hardness as a "shorthand" for water qualities that affect copper toxicity. In that study, they observed a clear effect of pH in addition to hardness. Since that time, several studies of the toxicity of metals in test waters of various compositions have been performed and the results do not confer a singular role to hardness in ameliorating metals toxicity. In recognition of this fact, most current studies carefully vary test water characteristics like pH, calcium, alkalinity, dissolved organic carbon, chloride, sodium, suspended solid s, and others while observing the responses of test organisms. It is likely that understanding metal toxicity in waters of various chemical makeups is not possible without the use of a geochemical model that is more elaborate than a regression formula. It may also be that simple toxicity tests (using mortality, growth, or reproductive endpoints) are not capable of discriminating the role of hardness or other water chemistry characteristics in modulating metals toxicity (Erickson et al. 1996). Gill surface interaction models have provided a useful framework for the study of acute metals toxicity in fish (Pagenkopf 1983; Playle *et al.* 1992; Playle *et al*. 1993a; Playle *et al*. 1993b; Janes and Playle 1995; Playle 1998), as have studies that observe physiological (e.g. ion fluxes) or biochemical (e.g. enzyme inhibition) responses (Lauren and McDonald 1986; Lauren and McDonald 1987a; Lauren and McDonald 1987b; Reid and McDonald 1988; Verbost *et al.* 1989; Bury *et al*. 1999a; Bury *et al*. 1999b). Even the earliest gill models accounted for the effects of pH on metal speciation and the effects of alkalinity on inorganic complexation, in addition to the competitive effects due to hardness ions (Pagenkopf 1983). Current gill models make use of sophisticated, computer-based, geochemical programs to more accurately account for modulating effects in waters of different chemical makeup (Playle 1998). These programs have aided in the interpretation of physiological or biochemical responses in fish and in

investigations that combine their measurement with gill metal burdens and traditional toxicity endpoints.

The Services recognize and acknowledge that hardness of water and the hardness acclimation status of a fish will modify toxicity and toxic response. However the use of hardness alone as a universal surrogate for all water quality parameters that may modify toxicity, while perhaps convenient, will clearly leave gaps in protection when hardness does not correlate with other water quality parameters such as DOC, pH, Cl- or alkalinity and will not provide the combination of comprehensive protection and site specificity that a multivariate water quality model could provide. In our review of the best available scientific literature the Services have found no conclusive evidence that water hardness, by itself, in either laboratory or natural water, is a consistent, accurate predictor of the aquatic toxicity of all metals in all conditions.

Hardness as a predictor of copper toxicity: Lauren and McDonald (1986) varied pH, alkalinity, and hardness independently at a constant sodium ion concentration, while measuring net sodium loss and mortality in rainbow trout exposed to copper. Sodium loss was an endpoint investigated because mechanisms of short-term copper toxicity in fish are related to disruption of gill ionoregulatory function. Their results indicated that alkalinity was an important factor reducing copper toxicity, most notably in natural waters of low calcium hardness and alkalinity. Meador (1991) found that both pH and dissolved organic carbon were important in controlling copper toxicity to *Daphnia magna*. Welsh *et al*. (1993) demonstrated the importance of dissolved organic carbon in affecting the toxicity of copper to fathead minnows and suggested that water quality criteria be reviewed to consider the toxicity of copper in waters of low alkalinity, moderately acidic pH, and low dissolved organic carbon concentrations. Applications of gill models to copper binding consider complexation by dissolved organic carbon, speciation and competitive effects of pH, and competition by calcium ions, not merely water hardness (Playle *et al*. 1992; Playle *et al*. 1993a; Playle *et al.* 1993b). Erickson *et al.* (1996) varied several test water qualities independently and found that pH, hardness, sodium, dissolved organic matter, and suspended solids have important roles in determining copper toxicity. They also suggested that it may difficult to sort out the effects of hardness based on simple toxicity experiments. It is clear that these studies question the use of site calcium + magnesium hardness only as input to a formula to derive a criterion for copper because pH, alkalinity, and dissolved organic carbon concentrations are key water quality variables that also modulate toxicity. In waters of moderately acidic pH, low alkalinity, and low dissolved organic carbon, the use of hardness regressions may be most inaccurate. Also, it is not clear that the dissolved organic carbon in most or all waters render metals unavailable. This is because dissolved

> organic carbon from different sources may vary in both binding capacity and stability (Playle 1998)."

As was required in the biological opinion, EPA has updated the water quality criteria for copper as cited above. Failure to utilize the updated criteria for copper in the Permit conflicts with the requirements of Section 122.44(d) of 40 CFR which requires that permits include water quality-based effluent limitations (WQBELs) to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water. Both EPA, in adopting the new criteria for copper, and the "Services" in issuing their biological opinion cite that the use of translators and the old hardness based standard for copper is likely not protective of the aquatic life beneficial use.

In the Regional Board's Response to Comments they state that: "Central Valley Water Board Staff does not concur. CSPA provides a discussion of the Biotic Ligand Model (BLM), which is a metal bioavailability model that uses receiving water body characteristics to develop site-specific water quality criteria. However, to use the BLM, a Basin Plan amendment allowing adjustment of an established criteria must be completed or USEPA must modify the CTR. CSPA also provides a discussion of the biological opinion from the US Fish and Wildlife Service and National Marine Fisheries Service on the promulgation of the CTR. Because the biological opinion was submitted on the proposed CTR rulemaking, USEPA would have considered the specific comment in the development of the final rulemaking of the CTR. Therefore, these comments by CSPA are directed at the CTR, not the proposed permit amendment, which must comply with the final CTR. Central Valley Water Board Staff properly applied the CTR when establishing WQBELs for the CTR metals with hardness-dependant criteria."

It is interesting the Regional Board cites that utilization of the BLM is a site specific objective requiring modification of the Basin Plan or the CTR. The Regional Board continually modifies US EPA's aluminum criteria in NPDES permits despite our objection regarding site specific objectives. We agree with the Regional Board's contention if the resulting limitation were to be less stringent than the hardness based criteria. However, if the BLM results in a limitation more stringent limitation; federal regulation 40 CFR 122.44(d) allows for application of the more stringent limitation. Based on the Regional Board's use of significantly relaxed hardness data; use of the BLM would likely result in more stringent limitations and not be subject to site-specific objective rules and procedures.

The Regional Board incorrectly cites that the biological opinion from the US Fish and Wildlife Service and National Marine Fisheries Service in only relevant with regard to adoption of the CTR. The biological opinion is binding on EPA and sets forth requirements for implementation of the CTR. The Regional Board ignores not only the biological opinion CTR implementation

requirements but the expert advice from the US Fish and Wildlife Service and National Marine Fisheries Service regarding the use of translators.

E. The Permit misquotes and misapplies a technical report in developing hardness based effluent limitations for metals; therefore, the effluent limitations developed utilizing this procedure are not protective of water quality and the beneficial uses of the receiving stream as required by 40 CFR 122.44.

The Permit cites a technical report (page F-19, footnote No. 4, 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.) as justification for utilizing a hardness other than the upstream ambient hardness in equations for developing effluent limitations for metals. The cited report states that:

"PROPOSED IMPLEMENTATION, It is proposed to develop water quality criteria for use in conducting "reasonable potential" analyses for the assignment of effluent limitations based on the following methodology. It has been demonstrated that the following methodology for setting fixed effluent limitations for hardness dependent metals will always be protective under all flow and mixing conditions (i.e., is independent of 1Q10 and 7Q10 design flows). <u>In situations where maximum receiving water contaminant concentrations are less than water quality objectives or if effluent will never make up 100 percent of the stream flow</u>, these same methodologies can be modified easily to set protective, fixed effluent limitations based on the maximum receiving water contaminant concentration or maximum percentage of effluent that will be present in the receiving water." (Emphasis added)

In this specific case, for the City of Davis, the upstream maximum contaminant level is minimally characterized by a statistically insignificant data set for metals. The Yolo Bypass is well documented at having extremely varied water quality conditions since it was constructed to receive flood waters from the Sacramento River. The instream data is not sufficient to confirm the requirement that the receiving water contaminant levels are always below the applicable water quality standard. This is also confirmed by the Permit requirement, on page 30, that: "*h. Priority Pollutant Metals Study. For a one-year period, beginning no later than 31 January 2011, the Discharger shall conduct monthly upstream receiving water monitoring for hardness-dependant priority pollutant metals (i.e., cadmium, chromium III, copper, lead, nickel, silver, and zinc), hardness, alkalinity, EC, pH, and TSS at RSW-001 and RSW-003. The Discharger shall submit a report summarizing the monitoring results no later than 3 months following the final monthly monitoring event. If there is no flow at RSW-001 or RSW-003 monitoring is not required and the report shall state that there was no flow.*

In assessing whether the receiving stream makes up 100% of the stream flow, the Page F-27 of the Permit states that: "*c. Assimilative Capacity/Mixing Zone, The State Water Resources Control Board Water Quality Order (WQO) No. 2002-0015, states that the use of the harmonic mean to determine flow rates is inappropriate for ephemeral streams where there is no consistent background dilution. The impact of considering a receiving stream to be ephemeral is that all limitations are "end of pipe" without any benefit of dilution. Since the receiving streams' flows are, at times, immeasurably small to nonexistent, this Order contains "end of pipe" limitations, with no dilution credits*."

The Permit conditions do not meet the requirements of the cited technical report for developing protective effluent limitations for hardness dependant metals.

F. The Permit establishes Effluent Limitations for metals based on the hardness of the effluent as opposed to the ambient upstream receiving water hardness as required by Federal Regulations, the California Toxics Rule (CTR, 40 CFR 131.38(c)(4)).

The State Board Order (WQ 2008-0008 corrected) remanded the permit back to the Regional Board for revision as follows:

> *"2. Revise the Fact Sheet to include a discussion of the appropriate hardness to use to protect from acute toxicity impacts (which can occur in short-term periods including storm events) in the receiving waters. The Fact Sheet should also state that the lowest valid upstream receiving water hardness values of 78 mg/l for Willow Slough Bypass and 85 mg/l for Conaway Ranch Toe Drain should be used to determine reasonable potential for the effluent to exceed the hardness-dependent metal CTR criteria, unless additional evidence and analysis, consistent with this Order, demonstrates that different hardness values are appropriate to use and are fully protective of water quality."*

Despite the State Board's Order the Permit regurgitates the same hardness use for developing metals limitations as was in the original permit. As we cite immediately above, the Permit and Regional Board staff does not even follow their cited methodology (Emerick) for use of the effluent or downstream hardness. The Permit ignores the State Board Order, ignores the Implementation Recommendations of their cited methodology, ignores the regulatory requirement to use the "ambient" upstream hardness, ignores the recommendations of the Fish and Wildlife and National Marine Fisheries Agencies biological opinion ignores US EPA's updated criteria for copper and ignores good science in developing limitations for hardness dependant metals.

Federal Regulation 40 CFR 131.38(c)(4) states that: "For purposes of calculating freshwater aquatic life criteria for metals from the equations in paragraph (b)(2) of this section, for waters

with a hardness of 400 mg/l or less as calcium carbonate, the actual ambient hardness of the surface water shall be used in those equations." (Emphasis added). The Permit states that the effluent hardness and the downstream hardness were used to calculate Effluent Limitations for metals. The definition of *ambient* is "in the surrounding area", "encompassing on all sides". It has been the Region 5, Sacramento, NPDES Section, in referring to Basin Plan objectives for temperature, to define *ambient* as meaning upstream. It is reasonable to assume, after considering the definition of ambient, that EPA is referring to the hardness of the receiving stream before it is potentially impacted by an effluent discharge. It is also reasonable to make this assumption based on past interpretations and since EPA, in permit writers' guidance and other reference documents, generally assumes receiving streams have dilution, which would ultimately "encompass" the discharge. Ambient conditions are in-stream conditions unimpacted by the discharge. The effluent hardness cannot be utilized in place of the surface water hardness which is mandated by 40 CFR 131.38(c)(4) for use in the CTR equations for hardness dependant metals.

The Federal Register, Volume 65, No. 97/Thursday, May 18th 2000 (31692), adopting the California Toxics Rule in confirming that the ambient hardness is the upstream hardness, absent the wastewater discharge, states that: "A hardness equation is most accurate when the relationship between hardness and the other important inorganic constituents, notably alkalinity and pH, are nearly identical in all of the dilution waters used in the toxicity tests and in the surface waters to which the equation is to be applied. If an effluent raises hardness but not alkalinity and/or pH, using the lower hardness of the downstream hardness might provide a lower level of protection than intended by the 1985 guidelines. If it appears that an effluent causes hardness to be inconsistent with alkalinity and/or pH the intended level of protection will usually be maintained or exceeded if either (1) data are available to demonstrate that alkalinity and/or pH do not affect the toxicity of the metal, or (2) the hardness used in the hardness equation is the hardness of upstream water that does not include the effluent. The level of protection intended by the 1985 guidelines can also be provided by using the WER procedure."

On March 24, 2000 the US Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS) issued a biological opinion on the effects of the final promulgation of the CTR on listed species and critical habitats in California in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.; Act). The biological opinion was issued to the U.S. Environmental Protection Agency, Region 9, with regard to the "Final Rule for the Promulgation of Water Quality Standards: Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California" (CTR)". The document represented the Services' final biological opinion on the effects of the final promulgation of the CTR on listed species and critical habitats in California in accordance with section 7 of the Endangered Species Act of 1973, as amended (16 USC 1531 et seq.; Act).

The biological opinion contains the following discussion, beginning on page 205, regarding the use of hardness in developing limitations for toxic metals:

> "The CTR should more clearly identify what is actually to be measured in a site water to determine a site-specific hardness value. Is the measure of hardness referred to in the CTR equations a measure of the water hardness due to calcium and magnesium ions only? If hardness computations were specified to be derived from data obtained in site water calcium and magnesium determinations alone, confusion could be avoided and more accurate results obtained (APHA 1985). Site hardness values would thus not include contributions from other multivalent cations (e.g., iron, aluminum, manganese), would not rise above calcium + magnesium hardness values, or result in greater-than-intended site criteria when used in formulas. In this Biological opinion, what the Services refer to as hardness is the water hardness due to calcium + magnesium ions only.
>
> The CTR should clearly state that to obtain a site hardness value, samples should be collected upstream of the effluent source(s). Clearly stating this requirement in the CTR would avoid the computation of greater-than-intended site criteria in cases where samples were collected downstream of effluents that raise ambient hardness, but not other important water qualities that affect metal toxicity (e.g., pH, alkalinity, dissolved organic carbon, calcium, sodium, chloride, etc.). Clearly, it is inappropriate to use downstream site water quality variables for input into criteria formulas because they may be greatly altered by the effluent under regulation. Alterations in receiving water chemistry by a discharger (e.g., abrupt elevation of hardness, changes in pH, exhaustion of alkalinity, abrupt increases in organic matter etc.) should not result, through application of hardness in criteria formulas, in increased allowable discharges of toxic metals. If the use of downstream site water quality variables were allowed, discharges that alter the existing, naturally-occurring water composition would be encouraged rather than discouraged. Discharges should not change water chemistry even if the alterations do not result in toxicity, because the aquatic communities present in a water body may prefer the unaltered environment over the discharge-affected environment. Biological criteria may be necessary to detect adverse ecological effects downstream of discharges, whether or not toxicity is expressed.
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> The CTR proposes criteria formulas that use site water hardness as the only input variable. In contrast, over twenty years ago Howarth and Sprague (1978) cautioned against a broad use of water hardness as a "shorthand" for water qualities that affect copper toxicity. In that study, they observed a clear effect of pH in addition to hardness. Since that time, several studies of the toxicity of metals in test waters of various compositions have been performed and the results do not confer a singular role to hardness in ameliorating metals toxicity. In recognition of this fact, most current studies

> carefully vary test water characteristics like pH, calcium, alkalinity, dissolved organic carbon, chloride, sodium, suspended solid s, and others while observing the responses of test organisms. It is likely that understanding metal toxicity in waters of various chemical makeups is not possible without the use of a geochemical model that is more elaborate than a regression formula. It may also be that simple toxicity tests (using mortality, growth, or reproductive endpoints) are not capable of discriminating the role of hardness or other water chemistry characteristics in modulating metals toxicity (Erickson *et al*. 1996). Gill surface interaction models have provided a useful framework for the study of acute metals toxicity in fish (Pagenkopf 1983; Playle *et al*. 1992; Playle *et al*. 1993a; Playle *et al*. 1993b; Janes and Playle 1995; Playle 1998), as have studies that observe physiological (e.g. ion fluxes) or biochemical (e.g. enzyme inhibition) responses (Lauren and McDonald 1986; Lauren and McDonald 1987a; Lauren and McDonald 1987b; Reid and McDonald 1988; Verbost *et al*. 1989; Bury *et al*. 1999a; Bury *et al*. 1999b). Even the earliest gill models accounted for the effects of pH on metal speciation and the effects of alkalinity on inorganic complexation, in addition to the competitive effects due to hardness ions (Pagenkopf 1983). Current gill models make use of sophisticated, computer-based, geochemical programs to more accurately account for modulating effects in waters of different chemical makeup (Playle 1998). These programs have aided in the interpretation of physiological or biochemical responses in fish and i n investigations that combine their measurement with gill metal burdens and traditional toxicity endpoints.
>
> The Services recognize and acknowledge that hardness of water and the hardness acclimation status of a fish will modify toxicity and toxic response. However the use of hardness alone as a universal surrogate for all water quality parameters that may modify toxicity, while perhaps convenient, will clearly leave gaps in protection when hardness does not correlate with other water quality parameters such as DOC, pH, Cl- or alkalinity and will not provide the combination of comprehensive protection and site specificity that a multivariate water quality model could provide. In our review of the best available scientific literature the Services have found no conclusive evidence that water hardness, by itself, in either laboratory or natural water, is a consistent, accurate predictor of the aquatic toxicity of all metals in all conditions.

SWRCB prescidential Order No. WQ 2008-0008 (Corrected) regarding a petition for consideration of the City of Davis' NPDES Permit states and concludes that:

> "Based on the current record, it would be more appropriate to use the lowest reliable upstream receiving water hardness values of 78 mg/l for Willows Slough Bypass and 85 mg/l for Conaway Ranch Toe Drain for protection from acute toxicity impacts, regardless of when the samples were taken or whether they were influenced by storm events.

> Because high flow conditions may deviate from the design flow conditions for selection of hardness as specified in the CTR, it may not be necessary, in some circumstances, to select the lowest hardness values from high flow or storm event conditions. Regardless of the hardness used, the resulting limits must always be protective of water quality criteria under all flow conditions."
>
> > "**Conclusion**: The Central Valley Water Board was justified in using upstream receiving water hardness values rather than effluent hardness values. However, for protection from acute toxicity impacts in the receiving waters, which can occur in short durations even during storm events, in this case, based on the existing record, the Central Valley Water Board should have used the lowest valid upstream receiving water hardness values of 78 mg/l for Willow Slough Bypass and 85 mg/l for Conaway Ranch Toe Drain. Effluent limitations must protect beneficial uses considering reasonable, worst-case conditions. We recognize that this approach does not necessarily agree with conclusions in other guidance stating that low flow conditions are the "worst-case" conditions. However, nothing in this Order is intended to suggest that low flows are inappropriate for determining the reasonable, worst-case conditions in other contexts." (Emphasis added)

The result of using a higher effluent or downstream hardness value is that metals are toxic at higher concentrations, discharges have less reasonable potential to exceed water quality standards and the resulting Permits have fewer Effluent Limitations. The most typical wastewater discharge situation is where the receiving water hardness is lower than the effluent hardness. Metals are more toxic in lower hardness water. For example, if the receiving water hardness is 25 mg/l and the effluent hardness is 50 mg/l a corresponding chronic discharge limitation for copper based on the different hardness's would be 2.9 ug/l and 5.2 ug/l, respectively. Obviously, the limitation based on the ambient receiving water hardness is more restrictive. The Regional Board's arguments with regard to effluent and/or downstream receiving water hardness can only be made if in-stream mixing is considered. Mixing zones may be granted in accordance with extensive requirements contained in the SIP and the Basin Plan to establish Effluent Limitations. Mixing zones cannot be considered in conducting a reasonable potential analysis to determine whether a constituent will exceed a water quality standard or objective. The Regional Board's approach in using the effluent or downstream hardness to conduct a reasonable potential analysis and consequently establish effluent limitations can only be utilized if mixing is considered; otherwise the ambient (upstream) hardness results in significantly more restrictive limitations. A mixing zone allowance has not been discussed with regard to this issue and therefore does not comply with the SIP.

The Regional Board cited the State Board's Water Quality Order (WQO)(No. 2008 0008) for the City of Davis as allowing complete discretion in utilizing the downstream hardness in deriving limits for toxic metals. WQO 2008 0008 in requiring the Regional Board to modify their permit states: "Revise the Fact Sheet to include a discussion of the appropriate hardness to use to protect from acute toxicity impacts (which can occur in short-term periods including storm events) in the receiving waters. The Fact Sheet should also state that the lowest valid upstream receiving water hardness values of 78 mg/l for Willow Slough Bypass and 85 mg/l for Conaway Ranch Toe Drain should be used to determine reasonable potential for the effluent to exceed the hardness-dependent metal CTR criteria, unless additional evidence and analysis, consistent with this Order, demonstrates that different hardness values are appropriate to use and are fully protective of water quality." The Regional Board did not use the lowest observed upstream hardness as required in WQO 2008 0008. The Regional Board has not provided additional evidence and analysis demonstrating that different hardness is fully protective of beneficial uses. To the contrary, the Regional Board does not address the March 24, 2000 the US Fish and Wildlife Service (Service) and the National Marine Fisheries Service (NMFS) CTR Biological Opinion cited above stating that the use of hardness alone is not protective of beneficial uses and recommending the sole use of the ambient upstream hardness in developing limits for toxic metals.

The issue is that the Regional Board fails to comply with the regulatory requirement to use the ambient instream hardness for limiting hardness dependant metals under the CTR. Use of the effluent or the effluent receiving water mix simply does not meet the definition of the actual ambient hardness of the receiving stream. The Permit failure to include Effluent Limitations for metals based on the actual ambient hardness of the surface water is contrary to the cited Federal Regulation and must be amended to comply with the cited regulatory requirement.

G. The Permit does not contain enforceable Effluent Limitations for chronic toxicity and therefore does not comply with the Basin Plan, Federal Regulations, at 40 CFR 122.44 (d)(1)(i) and the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (SIP).

The Permit has been modified as required by the State Board remand to include a narrative limitation for chronic toxicity. The Permit however also includes the following: "I. Chronic Whole Effluent Toxicity Effluent Limitation. Compliance with the accelerated monitoring and TRE/TIE provisions of Provision VI.C.2.a shall constitute compliance with effluent limitations IV.A.1.g and IV.A.2.g for chronic whole effluent toxicity."

The SIP, Section 4, Toxicity Control Provisions, Water Quality-Based Toxicity Control, states that: "A chronic toxicity effluent limitation is required in permits for all dischargers that will cause, have a reasonable potential to cause, or contribute to chronic toxicity in receiving waters." The SIP is a state *Policy* and CWC Sections 13146 and 13247 require that the Board in carrying

out activities which affect water quality shall comply with state policy for water quality control unless otherwise directed by statute, in which case they shall indicate to the State Board in writing their authority for not complying with such policy.

Federal regulations, at 40 CFR 122.44 (d)(1)(i), require that limitations must control all pollutants or pollutant parameters which the Director determines are or may be discharged at a level which will cause, or contribute to an excursion above any State water quality standard, including state narrative criteria for water quality. There has been no argument that domestic sewage contains toxic substances and presents a reasonable potential to cause toxicity if not properly treated and discharged. The Water Quality Control Plan for the Sacramento/ San Joaquin River Basins (Basin Plan), Water Quality Objectives (Page III-8.00) for Toxicity is a narrative criteria which states that all waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life. The Permit contains a narrative Effluent Limitation prohibiting the discharge of chronically toxic substances: however a *Compliance Determination* has been added to the Permit: "Compliance with the accelerated monitoring and TRE/TIE provisions of Provision VI.C.2.a shall constitute compliance with effluent limitations contained in sections IV.A.1.d and IV.B.1.d of this Order for chronic whole effluent toxicity ". The *Compliance Determination* nullifies the Effluent Limitation and makes toxic discharges unenforceable.

The Basin Plan narrative Toxicity Objective states that: "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, or aquatic life. This objective applies regardless of whether the toxicity is caused by a single substance or the interactive effect of multiple substances. Compliance with this objective will be determined by analyses of indicator organisms, species diversity, population density, growth anomalies, and biotoxicity tests of appropriate duration or other methods as specified by the Regional Board."

According to the Basin Plan toxicity sampling is required to determine compliance with the requirement that all waters be maintained free of toxic substances. Sampling does not equate with or ensure that waters are free of toxic substances. The Tentative Permit requires the Discharger to conduct an investigation of the possible sources of toxicity if a threshold is exceeded. This language is not a limitation and essentially eviscerates the Regional Board's authority, and the authority granted to third parties under the Clean Water Act, to find the Discharger in violation for discharging chronically toxic constituents. An enforceable effluent limitation for chronic toxicity must be included in the Order.

H. The Permit does not contain an Effluent Limitation for electrical conductivity (EC) in violation of Federal Regulations 40 CFR 122.44.

Federal Regulations, 40 CFR 122.44(d), requires that limits must be included in permits where pollutants will cause, have reasonable potential to cause, or contribute to an exceedance of the State's water quality standards. After reviewing the City of Davis permit the State Board Order (WQ 2008-0008 corrected) contained the following requirement regarding electrical conductivity:

> *"8. Review the City of Woodland's EC site-specific study to determine whether it provides an appropriate basis for calculating a final EC effluent limitation for the discharge regulated by the Permit, and if so, amend the Permit as necessary to make the appropriate changes for EC, including the addition of an effluent limitation as appropriate, based on that review. If the City of Woodland study is not used, findings justifying that decision must be made. This portion of the Order may take additional time to complete and may be completed after the revisions required by in sections 1 – 7 are completed."*

Page F-47 of the Permit states that: "State Water Board Order No. WQO 2008-0008 (City of Davis) concluded that the EC interim limitation was appropriate, but remanded the permit to the Regional Water Board to allow the Discharger use the results from the City of Woodland's EC site-specific study, in lieu of conducting a new study. The study provision has been modified to make this change."

The Permit intentionally misinterprets the State Board Order as not requiring modification to include a final effluent limitation for EC based on the City of Woodland's site specific study for EC.

Federal Regulations, 40 CFR 122.44 (d)(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." The Water Quality Control Plan (Basin Plan) for the Central Valley Region, Water Quality Objectives, page III-3.00, contains a Chemical Constituents Objective that includes Title 22 Drinking Water Maximum Contaminant Levels (MCLs) by reference. The Title 22 MCLs for EC are 900 µmhos/cm (recommended level), 1,600 µmhos/cm (upper level) and 2,200 µmhos/cm (short term maximum).

The Basin Plan states, on Page III-3.00 Chemical Constituents, that "Waters shall not contain constituents in concentrations that adversely affect beneficial uses." The Basin Plan's "Policy for Application of Water Quality Objectives" provides that in implementing narrative water quality objectives, the Regional Board will consider numerical criteria and guidelines developed

by other agencies and organizations. This application of the Basin Plan is consistent with Federal Regulations, 40CFR 122.44(d).

For EC, *Ayers R.S. and D.W. Westcott, Water Quality for Agriculture, Food and Agriculture Organization of the United Nations – Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985),* levels above 700 μmhos/cm will reduce crop yield for sensitive plants. The University of California, Davis Campus, Agricultural Extension Service, published a paper, dated 7 January 1974, stating that there will not be problems to crops associated with salt if the EC remains below 750 μmhos/cm.

The discharge of EC or TDS may exceed water quality objectives for each designated beneficial use:

MUN: The Drinking Water maximum contaminant levels (MCLs) are water quality objectives incorporated into the Basin Plan Chemical Constituents by reference. The MCL for TDS is 500 mg/l as the recommended level, 1,000 mg/l as an upper level and 1,500 mg/l as a short term maximum. *McKee and Wolf* (1971 Water Quality Criteria) cites that waters above 4,000 mg/l TDS are generally unfit for human use.

AGR: The Basin Plan states, on Page III-3.00 Chemical Constituents, that "Waters shall not contain constituents in concentrations that adversely affect beneficial uses." The Basin Plan's "Policy for Application of Water Quality Objectives" provides that in implementing narrative water quality objectives, the Regional Board will consider numerical criteria and guidelines developed by other agencies and organizations. This application of the Basin Plan is consistent with Federal Regulations, 40CFR 122.44(d). For EC, *Ayers R.S. and D.W. Westcott, Water Quality for Agriculture, Food and Agriculture Organization of the United Nations – Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985),* levels above 700 μmhos/cm will reduce crop yield for sensitive plants. The State Water Resources Control Board's *Irrigation with Reclaimed Municipal Waste (July 1984)* and *McKee and Wolf* (1971 Water Quality Criteria), state that waters with TDS above 2,100 mg/l are unsuitable for any irrigation under most conditions.

IND: *McKee and Wolf* (1971 Water Quality Criteria) lists the limiting TDS concentrations for numerous industrial uses in mg/l; boiler feed water 50-3000, brewing 500-1000, canning 850, general food processing 850 and paper manufacturing 80-500.

COLD/MIGR/SPWN: In a *Biological Significance* document sent to the Regional Board regarding the Musco Olive facility, dated November 1st 2006, James M. Harrington, Staff Water Quality Biologist with the California Department of Fish and Game, citing McKee and Wolf (1971 Water Quality Criteria) wrote that: "Surveys of inland fresh waters indicates that good mixes of fish fauna are found where conductivity values range between 150 and 500 umhos/cm. Even in the most alkaline waters, the upper tolerance limit for aquatic life is approximately 2000 umhos/cm."

The beneficial uses of receiving streams may be degraded by salt concentrations in wastewater discharges and Federal Regulation, 40 CFR 122.4 (a), (d) and (g) require that no permit may be issued when the conditions of the permit do not provide for compliance with the applicable requirements of the CWA, or regulations promulgated under the CWA, when imposition of conditions cannot ensure compliance with applicable water quality requirements and for any discharge inconsistent with a plan or plan amendment approved under Section 208(b) of the CWA. California Water Code, section 13377, requires that: "Notwithstanding any other provision of this division, the state board and the regional boards shall, as required or authorized by the Federal Water Pollution Control Act, as amended, issue waste discharge and dredged or fill material permits which apply and ensure compliance with all applicable provisions of the act and acts amendatory thereof or supplementary, thereto, together with any more stringent effluent standards or limitations necessary to implement water quality control plans, or for the protection of beneficial uses, or to prevent nuisance." The Region 5 Permits does not protect the beneficial uses of the receiving stream, the Sacramento River, and therefore does not comply with the requirements of Federal Regulations and the California Water Code.

The Central Valley Basin Plan, page IV-15.00, contains a *Controllable Factors Policy* which states that: "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 or Regional Water Board, and that may be reasonably controlled."

The discharge of salt (EC or TDS) may be a designated waste as defined by the CWC, Section 13173(b) as nonhazardous waste that contains pollutants that could be released in concentrations exceeding applicable water quality objectives; which must be regulated in accordance with Title CCR 27. The discharge of salt may exceed the Toxicity and Chemical Constituents (drinking water MCL and at concentrations that adversely affect the industrial and agricultural beneficial

uses) water quality objectives. CCR, Title 27, Section 20210, requires that designated wastes shall only be discharged at Class I or Class II waste management units. Designated waste must be kept out of the receiving stream. The Region 5 Permits consistently allow the discharge of a designated waste to surface water in violation of CCR Title 27.

The discharge exceeds the MCLs for EC presenting a reasonable potential to exceed the water quality objective. The discharge exceeds the agricultural water quality goal and the MCL for EC. The proposed Order fails to establish an effluent limitation for EC that are protective of the Chemical Constituents water quality objective. The City's wastewater discharge increases concentrations of EC to unacceptable concentrations adversely affecting the agricultural beneficial use. The wastewater discharge not only presents a reasonable potential, but actually causes, violation of the Chemical Constituent Water Quality Objective in the Basin Plan. The available literature regarding safe levels of EC for irrigated agriculture mandate that an Effluent Limitation for EC is necessary to protect the beneficial use of the receiving stream in accordance with the Basin Plan and Federal Regulations. Failure to establish effluent limitations for EC that are protective of the Chemical Constituents water quality objective blatantly violates the law.

Federal Regulation, 40 CFR 122.44, which mandates an effluent limitation be established if a discharge exceeds a water quality objective. MCLs are incorporated into the Basin Plan by reference. State Board Water Quality Order 2005-005 states, in part that:*"…the State Board takes official notice [pursuant to Title 23 of California Code of Regulations, Section 648.2] of the fact that operation of a large-scale reverse osmosis treatment plant would result in production of highly saline brine for which an acceptable method of disposal would have to be developed. Consequently, any decision that would require use of reverse osmosis to treat the City's municipal wastewater effluent on a large scale should involve thorough consideration of the expected environmental effects."* The State Board does not have the authority to ignore Federal Regulation. Bay Area treatment plants have been utilized for RO brine disposal previously.

I. The Permit contains no antidegradation analysis and does not comply with the requirements of Section 101(a) of the Clean Water Act, Federal Regulations 40 CFR § 131.12, the State Board's Antidegradation Policy (Resolution 68-16) and California Water Code (CWC) Sections 13146 and 13247.

The Permit would significantly relax effluent limitations for ammonia, and copper. The Permit does not contain any discussion of the proposed relaxation of limitations with regard to the Antidegradation Policy or Federal antidegradation regulation.

CWC Sections 13146 and 13247 require that the Board in carrying out activities which affect water quality shall comply with state policy for water quality control unless otherwise directed

by statute, in which case they shall indicate to the State Board in writing their authority for not complying with such policy. The State Board has adopted the Antidegradation Policy (Resolution 68-16), which the Regional Board has incorporated into its Basin Plan. The Regional Board is required by the CWC to comply with the Antidegradation Policy.

Section 101(a) of the Clean Water Act (CWA), the basis for the antidegradation policy, states that the objective of the Act is to "restore and maintain the chemical, biological and physical integrity of the nation's waters." Section 303(d)(4) of the CWA carries this further, referring explicitly to the need for states to satisfy the antidegradation regulations at 40 CFR § 131.12 before taking action to lower water quality. These regulations (40 CFR § 131.12(a)) describe the federal antidegradation policy and dictate that states must adopt both a policy at least as stringent as the federal policy as well as implementing procedures.

California's antidegradation policy is composed of both the federal antidegradation policy and the State Board's Resolution 68-16 (State Water Resources Control Board, Water Quality Order 86-17, p. 20 (1986) ("Order 86-17); Memorandum from Chief Counsel William Attwater, SWRCB to Regional Board Executive Officers, "federal Antidegradation Policy," pp. 2, 18 (Oct. 7, 1987) ("State Antidegradation Guidance")). As a state policy, with inclusion in the Water Quality Control Plan (Basin Plan), the antidegradation policy is binding on all of the Regional Boards (Water Quality Order 86-17, pp. 17-18).

Implementation of the state's antidegradation policy is guided by the State Antidegradation Guidance, SWRCB Administrative Procedures Update 90-004, 2 July 1990 ("APU 90-004") and USEPA Region IX, "Guidance on Implementing the Antidegradation Provisions of 40 CFR 131.12" (3 June 1987) (" Region IX Guidance"), as well as Water Quality Order 86-17.

The Regional Board must apply the antidegradation policy whenever it takes an action that will lower water quality (State Antidegradation Guidance, pp. 3, 5, 18, and Region IX Guidance, p. 1). Application of the policy does not depend on whether the action will actually impair beneficial uses (State Antidegradation Guidance, p. 6). Actions that trigger use of the antidegradation policy include issuance, re-issuance, and modification of NPDES and Section 404 permits and waste discharge requirements, waiver of waste discharge requirements, issuance of variances, relocation of discharges, issuance of cleanup and abatement orders, increases in discharges due to industrial production and/or municipal growth and/other sources, exceptions from otherwise applicable water quality objectives, etc. (State Antidegradation Guidance, pp. 7-10, Region IX Guidance, pp. 2-3). Both the state and federal policies apply to point and nonpoint source pollution (State Antidegradation Guidance p. 6, Region IX Guidance, p. 4).

J. Effluent limitations for ammonia have been modified in the Permit that were not the subject of the State Board's remand back to the Regional Board and are included

contrary to the Federal Requirements in federal regulation 40 CFR 122.62(a) which specifies cases for modification of an NPDES permit. The Permit does not contain an Effluent Limitation for ammonia in violation of Federal Regulations 40 CFR 122.44.

Federal Regulations, 40 CFR 122.62, contains limited reasons why a permit can be reopened and modified. Modification of the Receiving Water Limitations, which was not addressed in the State Board remand, for temperature and turbidity does not meet any of the tests required to reopen and modify the permit. The Permit does not address the regulatory requirements or standards for reopening and modifying the permit for ammonia.

The Effluent Limitations for ammonia have been relaxed based on the application of a maximum discharge limitation for pH of 8.0. The City of Davis operates a wastewater pond system which has been well documented to exceed a pH of 8.0 which is typical of wastewater pond systems. The relaxation of ammonia limitations based on a lower pH is not protective of the beneficial uses of the receiving stream since the pond system is likely to again violate the lower pH limitation.

K. The Permit contains Effluent Limitations for ammonia and copper less stringent than the existing permit contrary to the Antibacksliding requirements of the Clean Water Act and Federal Regulations, 40 CFR 122.44 (l)(1).

Under the Clean Water Act (CWA), point source dischargers are required to obtain federal discharge (NPDES) permits and to comply with water quality based effluent limits (WQBELs) in NPDES permits sufficient to make progress toward the achievement of water quality standards or goals. The antibacksliding and antidegradation rules clearly spell out the interest of Congress in achieving the CWA's goal of continued progress toward eliminating all pollutant discharges. Congress clearly chose an overriding environmental interest in clean water through discharge reduction, imposition of technological controls, and adoption of a rule against relaxation of limitations once they are established.

Upon permit reissuance, modification, or renewal, a discharger may seek a relaxation of permit limitations. However, according to the CWA, relaxation of a WQBEL is permissible only if the requirements of the antibacksliding rule are met. The antibacksliding regulations prohibit EPA from reissuing NPDES permits containing interim effluent limitations, standards or conditions less stringent than the final limits contained in the previous permit, with limited exceptions. These regulations also prohibit, with some exceptions, the reissuance of permits originally based on best professional judgment (BPJ) to incorporate the effluent guidelines promulgated under CWA §304(b), which would result in limits less stringent than those in the previous BPJ-based permit. Congress statutorily ratified the general prohibition against backsliding by enacting

§§402(o) and 303(d)(4) under the 1987 Amendments to the CWA. The amendments preserve present pollution control levels achieved by dischargers by prohibiting the adoption of less stringent effluent limitations than those already contained in their discharge permits, except in certain narrowly defined circumstances.

When attempting to backslide from WQBELs under either the antidegradation rule or an exception to the antibacksliding rule, relaxed permit limits must not result in a violation of applicable water quality standards. The general prohibition against backsliding found in §402(o)(1) of the Act contains several exceptions. Specifically, under §402(o)(2), a permit may be renewed, reissued, or modified to contain a less stringent effluent limitation applicable to a pollutant *if*: (A) material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation; (B)(i) 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; or (ii) the Administrator determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under subsection (a)(1)(B) of this section; (C) a less stringent effluent limitation is necessary because of events over which the permittee has no control and for which there is no reasonably available remedy [(e.g., Acts of God)]; (D) the permittee has received a permit modification under section 1311(c), 1311(g), 1311(h), 1311(i), 1311(k), 1311(n), or 1326(a) of this title; or (E) the permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit, and has properly operated and maintained the facilities, but has nevertheless been unable to achieve the previous effluent limitations, in which case the limitations in the reviewed, reissued, or modified permit may reflect the level of pollutant control actually achieved (but shall not be less stringent than required by effluent guidelines in effect at the time of permit renewal, reissuance, or modification).

Even if a discharger can meet either the requirements of the antidegradation rule under §303(d)(4) or one of the statutory exceptions listed in §402(o)(2), there are still limitations as to how far a permit may be allowed to backslide. Section 402(o)(3) acts as a floor to restrict the extent to which BPJ and water quality-based permit limitations may be relaxed under the antibacksliding rule. Under this subsection, even if EPA allows a permit to backslide from its previous permit requirements, EPA may never allow the reissued permit to contain effluent limitations which are less stringent than the current effluent limitation guidelines for that pollutant, or which would cause the receiving waters to violate the applicable state water quality standard adopted under the authority of §303.49.

Federal regulations 40 CFR 122.44 (l)(1) have been adopted to implement the antibacksliding requirements of the CWA:

(l) Reissued permits. (1) Except as provided in paragraph (l)(2) of this section when a permit is renewed or reissued, interim effluent limitations, standards or conditions must be at least as stringent as the final effluent limitations, standards, or conditions in the previous permit (unless the circumstances on which the previous permit was based have materially and substantially changed since the time the permit was issued and would constitute cause for permit modification or revocation and reissuance under Sec. 122.62.)

(2) In the case of effluent limitations established on the basis of Section 402(a)(1)(B) of the CWA, a permit may not be renewed, reissued, or modified on the basis of effluent guidelines promulgated under section 304(b) subsequent to the original issuance of such permit, to contain effluent limitations which are less stringent than the comparable effluent limitations in the previous permit.

(i) Exceptions--A permit with respect to which paragraph (l)(2) of this section applies may be renewed, reissued, or modified to contain a less stringent effluent limitation applicable to a pollutant, if:

(A) Material and substantial alterations or additions to the permitted facility occurred after permit issuance which justify the application of a less stringent effluent limitation;

(B)(1) 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; or (2) The Administrator determines that technical mistakes or mistaken interpretations of law were made in issuing the permit under section 402(a)(1)(b);

(C) A less stringent effluent limitation is necessary because of events over which the permittee has no control and for which there is no reasonably available remedy;

(D) The permittee has received a permit modification under section 301(c), 301(g), 301(h), 301(i), 301(k), 301(n), or 316(a); or

(E) The permittee has installed the treatment facilities required to meet the effluent limitations in the previous permit and has properly operated and maintained the facilities but has nevertheless been unable to achieve the previous effluent limitations, in which case the limitations in the reviewed, reissued, or modified permit may reflect the level of pollutant control actually achieved (but shall not be less stringent than required by effluent guidelines in effect at the time of permit renewal, reissuance, or modification).

(ii) Limitations. In no event may a permit with respect to which paragraph (l)(2) of this section applies be renewed, reissued, or modified to contain an effluent

> limitation which is less stringent than required by effluent guidelines in effect at the time the permit is renewed, reissued, or modified. In no event may such a permit to discharge into waters be renewed, issued, or modified to contain a less stringent effluent limitation if the implementation of such limitation would result in a violation of a water quality standard under section 303 applicable to such waters.

5. THE MANNER IN WHICH THE PETITIONERS ARE AGGRIEVED.

CSPA is a non-profit, environmental organization that has a direct interest in reducing pollution to the waters of the Central Valley. CSPA's members benefit directly from the waters in the form of recreational hiking, photography, fishing, swimming, hunting, bird watching, boating, consumption of drinking water and scientific investigation. Additionally, these waters are an important resource for recreational and commercial fisheries. Central Valley waterways also provide significant wildlife values important to the mission and purpose of the Petitioners. This wildlife value includes critical nesting and feeding grounds for resident water birds, essential habitat for endangered species and other plants and animals, nursery areas for fish and shellfish and their aquatic food organisms, and numerous city and county parks and open space areas. CSPA's members reside in communities whose economic prosperity depends, in part, upon the quality of water. CSPA has actively promoted the protection of fisheries and water quality throughout California before state and federal agencies, the State Legislature and Congress and regularly participates in administrative and judicial proceedings on behalf of its members to protect, enhance, and restore declining aquatic resources. CSPA member's health, interests and pocketbooks are directly harmed by the failure of the Regional Board to develop an effective and legally defensible program addressing discharges to waters of the state and nation.

6. THE SPECIFIC ACTION BY THE STATE OR REGIONAL BOARD WHICH PETITIONER REQUESTS.

Petitioners seek an Order by the State Board to:

> A. Vacate Order No. R5-2007-0132-02 (NPDES No. CA0079049) and remand to the Regional Board with instructions prepare and circulate a new tentative order that comports with regulatory requirements.
>
> B. Alternatively, prepare, circulate and issue a new order that is protective of identified beneficial uses and comports with regulatory requirements.

7. A STATEMENT OF POINTS AND AUTHORITIES IN SUPPORT OF LEGAL ISSUES RAISED IN THE PETITION.

CSPA's arguments and points of authority are adequately detailed in the above comments and our 1 August 2010 comment letter. Should the State Board have additional questions regarding the issues raised in this petition, CSPA will provide additional briefing on any such questions. The petitioners believe that an evidentiary hearing before the State Board will not be necessary to resolve the issues raised in this petition. However, CSPA welcomes the opportunity to present oral argument and respond to any questions the State Board may have regarding this petition.

8. A STATEMENT THAT THE PETITION HAS BEEN SENT TO THE APPROPRIATE REGIONAL BOARD AND TO THE DISCHARGERS, IF NOT THE PETITIONER.

A true and correct copy of this petition, without attachment, was sent electronically and by First Class Mail to Ms. Pamela Creedon, Executive Officer, Regional Water Quality Control Board, Central Valley Region, 11020 Sun Center Drive #200, Rancho Cordova, CA 95670-6114. A true and correct copy of this petition, without attachment, was sent to the Discharger in care of: Mr. Keith Smith, Utilities Engineer, City of Davis, Department of Public Works, 23 Russell Blvd., Davis, CA 95616.

9. A STATEMENT THAT THE ISSUES RAISED IN THE PETITION WERE PRESENTED TO THE REGIONAL BOARD BEFORE THE REGIONAL BOARD ACTED, OR AN EXPLANATION OF WHY THE PETITIONER COULD NOT RAISE THOSE OBJECTIONS BEFORE THE REGIONAL BOARD.

CSPA presented the issues addressed in this petition to the Regional Board in the 1 August 2010 comment letter that was accepted into the record.

If you have any questions regarding this petition, please contact Bill Jennings at (209) 464-5067 or Michael Jackson at (530) 283-1007.

Dated: 20 October 2010

Respectfully submitted,

Bill Jennings, Executive Director
California Sportfishing Protection Alliance

Attachment No. 1: Order No. R5-2010-0097
No. 2: Order No. R5-2007-0132-02

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2010-0097

AMENDING WASTE DISCHARGE REQUIREMENTS
ORDER NO. R5-2007-0132-01 (NPDES PERMIT NO. CA0079049)

CITY OF DAVIS
DAVIS WASTEWATER TREATMENT PLANT
YOLO COUNTY

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

1. On 25 October 2007, the Central Valley Water Board adopted Waste Discharge Requirements (WDR) Order No. R5-2007-0132, prescribing waste discharge requirements for the City of Davis Wastewater Treatment Plant, Yolo County. For the purposes of this Order, the City of Davis is hereafter referred to as "Discharger" and the City of Davis Wastewater Treatment Plant is hereafter referred to as "Facility."

2. The Discharger owns and operates a wastewater collection, treatment, and disposal system, and provides sewerage service to the City of Davis and serves a population of 65,000. The treatment system consists of a mechanical bar screen, an aerated grit tank, sedimentation tanks, a primary anaerobic digester, a secondary anaerobic digester, sludge lagoons, aeration ponds (typically used in winter), facultative oxidation ponds, a Lemna pond, an overland flow system, a chlorine contact tank, and restoration wetlands (used when discharging to Conaway Ranch Toe Drain). The Facility is permitted to discharge an average daily flow of 7.5 million gallons per day of treated municipal wastewater to Willow Bypass Slough (Discharge 001) and Conaway Ranch Toe Drain (Discharge 002), both are waters of the United States, and tributary to the Yolo Bypass within the Sacramento River watershed.

3. After adoption by the Central Valley Water Board, Order No. R5-2007-0132 was petitioned to the State Water Resources Control Board (State Water Board) by the California Sportfishing Protection Alliance. On 2 September 2008, the State Water Board adopted WQO No. 2008-0008 remanding the permit to the Central Valley Water Board for modifications, as discussed in findings six through eight, below.

4. Subsequent to the State Water Board's adoption of WQO 2008-0008, the Central Valley Water Board amended Order No. R5-2007-0132 by adopting WDR Order No. R5-2007-0132-01 on 5 February 2009. The amendment (1) added a requirement for the Discharger to conduct a wastewater reuse feasibility study to examine the feasibility of delivering part or all of its secondary treated wastewater to neighboring lands owned by the Conaway Ranch Preservation Group, (2) extended the compliance due date for compliance with effluent limitations for biochemical oxygen demand, total suspended solids, turbidity, total coliform organisms, aluminum, ammonia, and iron, and (3) modified

the Groundwater Monitoring and Best Practicable Treatment and Control (BPTC) Study requirements.

5. This Order reopens and amends Order R5-2007-0132-01 to address the permit revisions required in WQO 2008-0008. Additionally, this Order reopens and amends Order R5-2008-0132-01 based on new information provided by the Discharger, as described in findings nine through eleven, below.

Permit Revisions Based on State Water Board WQO 2008-0008

6. The State Water Board concluded in WQO 2008-0008 that a numeric effluent limitation for chronic toxicity in the permit is not appropriate. However, the remand requires that the permit be amended to include a narrative effluent limitation for chronic toxicity. In accordance with WQO 2008-0008, this Order amends Order R5-2007-0132-01 by including a narrative effluent limitation for chronic toxicity.

7. The State Water Board found in WQO 2008-0008 that for protection from acute toxicity impacts in the receiving waters, all flow conditions must be considered in determining the appropriate hardness for calculating the water quality criteria for California Toxics Rule (CTR) metals with hardness-dependent criteria. WQO 2008-0008 states that the Fact Sheet should include a discussion of the appropriate hardness to use to protect from acute toxicity impacts in the receiving waters and the reasonable potential analysis for the CTR metals, copper, lead, nickel, silver, and zinc, must be re-evaluated for Discharge 001 and Discharge 002. In accordance with WQO 2008-0008, this Order amends Order R5-2007-0132-01 by re-evaluating the hardness used for calculating the water quality criteria for CTR metals with hardness-dependent criteria for Discharge 001 and Discharge 002 to ensure that the receiving water is protected against acutely toxic conditions and the reasonable potential analysis for copper, lead, nickel, silver, and zinc has been re-evaluated.

8. The State Water Board concluded in WQO 2008-0008 that the Central Valley Water Board appropriately determined that it should consider site-specific factors before establishing a final effluent limit of 700 µmhos/cm for electrical conductivity (EC) and thus a site-specific study requirement was appropriate. However, since the City of Woodland has submitted such a study involving the same downstream receiving waters, agricultural lands, and geographical area, the State Water Board has directed the Central Valley Water Board to review and consider the results and findings of that study or other studies to determine if it can establish an appropriate final EC effluent limitation. The State Water Board allowed additional time for the Central Valley Water Board to make this determination. Therefore, this Order does not make any significant changes regarding EC. However, this Order amends Order R5-2007-0132-01 by adding a discussion of the State Water Board decision regarding EC.

Permit Revisions Based on Submittal of New Information

9. Order No. R5-2007-0132-01 contains final water quality-based effluent limitations for ammonia, which are based on the existing effluent quality[1]. The Facility cannot immediately comply with the final ammonia effluent limitations. Therefore, Order No. R5-2007-0132-01 includes a compliance schedule with compliance required by 25 October 2017. The Discharger is designing a complete reconstruction of the Facility to a more conventional treatment system that will provide ammonia removal. The new treatment plant is expected to result in more consistent effluent pH control with lower effluent pH. Since the discharge conditions for the design of the new facility are much different than the existing conditions, the Discharger requests that the final effluent limitations for ammonia be based on the projected effluent quality of the new, more conventional treatment facility. Therefore, this Order amends R5-2007-0132-01 by reducing the instantaneous maximum final effluent limitation for pH from 8.5 to 8.0 and recalculating final effluent limitations for ammonia based on the lower pH.

10. Order No. R5-2007-0132-01 contains Receiving Water Limitations for pH which states that the discharge shall not cause a change in receiving water pH of more than 0.5 units (as monthly average). On 25 October 2007 the Central Valley Water Board adopted resolution R5-2007-0136 amending the Water Quality Control Plan for the Sacramento and San Joaquin River Basins. The October 2007 Basin Plan amendment removed the 0.5 units change in pH restriction, which became effective 7 July 2009. Therefore, this Order amends Order R5-2007-0132-01 by removing the 0.5 units change in pH restriction in the Receiving Water Limitations.

11. Order No. R5-2007-0132-01 contains a provision requiring the Discharger to conduct an EC, Boron, Sodium, and Chloride Study (Salt Study). As part of this provision, a work plan and time schedule was submitted and approved by the Central Valley Water Board on 29 December 2008. This provision requires completion of the Salt Study by 27 October 2010 with a Salt Study report submittal date of 27 January 2011. Developments have occurred regarding approaches to determining applicable standards for salinity in Central Valley receiving waters, including the State Board's reevaluation of salinity standards in the South Delta as described in the report by Dr. Hoffman, *Salt Tolerance of Crops in the Southern Sacramento-San Joaquin Delta*. Therefore, this Order extends the EC, Boron, Sodium, and Chloride Study compliance date to 15 February 2015 to allow reevaluation of the study work plan to ensure consistency with the State Water Board's re-evaluation of salinity standards in the South Delta.

12. Order No. R5-2007-0132-01 contains a provision requiring the Discharger to conduct a Groundwater Monitoring and Best Practicable Treatment and Control (BPTC) Study (Groundwater Study). The initial Order required one year of groundwater monitoring using existing wells. The Groundwater Study was subsequently amended to require the

[1] The ammonia effluent limitations are based on pH-dependent water quality criteria using the existing maximum reported effluent pH values.

Discharger evaluate its groundwater monitoring well network and added an additional year of groundwater monitoring. Although the amended Order required an additional year of monitoring, the due date for submittal of the monitoring data was not extended. In addition, the due date for the BPTC evaluation, which is dependent on an analysis of the groundwater monitoring data, was not extended either. Therefore, this Order corrects the Amended Order by extending the due dates to coincide with the requirement to conduct an additional year of groundwater monitoring.

13. Issuance of this Order is exempt from the provisions of the California Environmental Quality Act (Public Resources Code section 21000, et seq.), in accordance with CWC section 13389.

14. The Central Valley Water Board has notified the Discharger and interested agencies and persons of its intent to amend Waste Discharge Requirements and the Monitoring Program Requirements for this discharge and has provided them with an opportunity to submit their written views and recommendations.

15. Any person aggrieved by this action of the Central Valley Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date that this Order becomes final, except that if the thirtieth day following the date that this Order becomes final falls on a Saturday, Sunday, or state holiday (including mandatory furlough days), the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at: http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.

IT IS HEREBY ORDERED THAT:

Waste Discharge Requirements Order No. R5-2007-0132-01 (NPDES No. CA0079049) is amended as shown in underline/strikeout format in Attachment 1 to this Order. This Order is effective upon adoption.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 23 September 2010.

Original Signed by Kenneth D. Landau for
PAMELA C. CREEDON, Executive Officer

ATTACHMENT 1

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

CENTRAL VALLEY REGION

11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114
Phone (916) 464-3291 • FAX (916) 464-4645
http://www.waterboards.ca.gov/centralvalley

ORDER NO. R5-2007-0132-02
(as amended by Order No. R5-2010-0097)
NPDES NO. CA0079049
WASTE DISCHARGE REQUIREMENTS FOR THE CITY OF DAVIS WASTEWATER TREATMENT PLANT YOLO COUNTY

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

Table 1. Discharger Information

Discharger	City of Davis
Name of Facility	Wastewater Treatment Plant
Facility Address	45400 County Road 28H, Davis, CA, 95616, Yolo County
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board have classified this discharge as a **major** discharge.	

The discharge by the City of Davis from the discharge points identified below is subject to waste discharge requirements as set forth in this Order:

Table 2. Discharge Location

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Treated Municipal Wastewater	38 º, 35', 24" N	121 º, 39', 50" W	Willow Slough Bypass
002	Treated Municipal Wastewater	38 º, 34', 33" N	121 º, 38', 02" W	Conaway Ranch Toe Drain

Table 3. Administrative Information

This Order was adopted by the Regional Water Quality Control Board on:	**25 October 2007**
This Order shall become effective on:	**50 Days after Order Adoption Date**
This Order shall expire on:	**1 October 2012**
The Discharger shall file a Report of Waste Discharge in accordance with title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than:	**180 days prior to Order expiration date**

IT IS HEREBY ORDERED, that Order No. 5-01-067 is rescinded upon the effective date of this Order except for enforcement purposes, and, in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act (CWA) and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on **25 October 2007** and amended on **5 February 2009 and 23 September 2010.**

PAMELA C. CREEDON, Executive Officer

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List of Attachments

I. FACILITY INFORMATION

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

Table 4. Facility Information

Discharger	City of Davis
Name of Facility	Wastewater Treatment Plant
Facility Address	45400 County Road 28H
	Davis, CA 95616
	Yolo County
Facility Contact, Title, and Phone	Keith Smith, Utilities Engineer, (530) 757-5676
Mailing Address	23 Russell Blvd., Davis, CA 95616
Type of Facility	POTW (Standard Industrial Classification: 4952)
Facility Design Flow	7.5 million gallons per day, average dry weather flow

II. FINDINGS

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

A. Background. The City of Davis (hereinafter Discharger) is currently discharging pursuant to Order No. 5-01-067 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA0079049. The Discharger submitted a Report of Waste Discharge, dated 1 September 2005**,** and applied for an NPDES permit renewal to discharge up to an average dry weather flow of 7.5 million gallons per day of treated wastewater from its wastewater treatment plant, hereinafter Facility or WWTP. The application was deemed complete on 17 October 2005.

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

B. Facility Description. The Discharger owns and operates the WWTP. The treatment system consists of a mechanical bar screen, an aerated grit tank, three primary sedimentation tanks, a primary anaerobic digester, a secondary anaerobic digester, three sludge lagoons, two aeration ponds (typically used in winter), three facultative oxidation ponds, a Lemna pond, an overland flow system, a chlorine contact tank, and restoration wetlands (used when discharging to Conaway Toe Drain). Biosolids are dewatered in on-site lagoons and the dried biosolids are land applied on-site in the overland flow fields. Wastewater is discharged from Discharge 001 (see table on cover page) to the Willow Slough Bypass and from Discharge 002 to the Conaway Ranch Toe Drain, both of which are waters of the United States and tributary to the Yolo Bypass within the Sacramento River watershed. Attachment B provides a map of the area around the Facility. Attachment C provides a flow schematic of the Facility.

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

D. Background and Rationale for Requirements. The Regional Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and other available information. The Fact Sheet (Attachment F), which contains background information and rationale for Order requirements, is hereby incorporated into this Order and constitutes part of the Findings for this Order. Attachments A through E are also incorporated into this Order.

E. California Environmental Quality Act (CEQA). Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code sections 21100-21177.

F. Technology-based Effluent Limitations. Section 301(b) of the CWA and implementing USEPA permit regulations at section 122.44, title 40 of the Code of Federal Regulations (CFR)[1] 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 Part 133 for the existing WWTP and Best Professional Judgment (BPJ) in accordance with Part 125, section 125.3 for the upgraded WWTP. A detailed discussion of the technology-based effluent limitations development is included in the Fact Sheet (Attachment F).

G. Water Quality-based Effluent Limitations. Section 301(b) of the CWA and 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 Regional Water Board has considered the factors listed in CWC section 13241 in establishing these requirements. The rationale for these requirements, which consist of tertiary treatment or equivalent requirements, is discussed in the Fact Sheet.

CFR Section 122.44(d)(1)(i) mandates that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a water quality standard, including numeric and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, water quality-based effluent limitations (WQBELs) must be established using: (1) EPA

[1] All further statutory references are to title 40 of the Code of Federal Regulations unless otherwise indicated.

criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric water quality criterion, such as a proposed State criterion or policy interpreting the State's narrative criterion, supplemented with other relevant information, as provided in 40 CFR section 122.44(d)(1)(vi).

H. Water Quality Control Plans. The Regional Water Board adopted a *Water Quality Control Plan, Fourth Edition (Revised August 2006), for the Sacramento and San Joaquin River Basins* (hereinafter Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. The Basin Plan at page II-2.00 states that the "…*beneficial uses of any specifically identified water body generally apply to its tributary streams*." Willow Slough Bypass is tributary to the Conaway Ranch Toe Drain and both streams are tributary to the Yolo Bypass. The Basin Plan does not specifically identify beneficial uses for the Willow Slough Bypass and Conaway Ranch Toe Drain, but does identify present and potential uses for the Yolo Bypass. These beneficial uses are as follows: agricultural supply, including stock watering; water contact recreation; non-contact water recreation; warm freshwater habitat; potential cold freshwater habitat; warm migration of aquatic organisms; cold migration of aquatic organisms; warm spawning, reproduction, and/or early development; and wildlife habitat.

In addition, the Basin Plan implements State Water Resources Control Board (State Water Board) Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. The Basin Plan designates beneficial uses for the Yolo Bypass and these beneficial uses do not include municipal/domestic supply. Thus, as discussed in detail in the Fact Sheet, beneficial uses applicable to the Willow Slough Bypass and Conaway Ranch Toe Drain are as follows:

Table 5. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	**Willow Slough Bypass**	Existing: Agricultural supply (AGR), water contact recreation (REC-1), non-contact water recreation (REC-2), warm freshwater habitat (WARM), migration of aquatic organisms (MIGR), spawning, reproduction, and/or early development (SPWN), and wildlife habitat (WILD). Potential Cold freshwater habitat (COLD).
002	**Conaway Ranch Toe Drain**	Existing: Agricultural supply (AGR), water contact recreation (REC-1), non-contact water recreation (REC-2), warm freshwater habitat (WARM), migration of aquatic organisms (MIGR), spawning, reproduction, and/or early development (SPWN), and wildlife habitat (WILD). Potential Cold freshwater habitat (COLD).

The Basin Plan includes a list of Water Quality Limited Segments (WQLSs), which are defined as "…*those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources (40 CFR 130, et seq.)*." The Basin Plan also states, "*Additional treatment beyond minimum federal standards will be imposed on dischargers to WQLSs. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.*" Neither the Willow Slough Bypass, the Conaway Ranch Toe Drain, nor the Yolo Bypass are listed as WQLSs in the 303(d) list of impaired water bodies. However, these water bodies are tributary to the Sacramento/San Joaquin Delta (northern portion), which is listed as a WQLS for chlorpyrifos, DDT, diazinon, exotic species, group A pesticides (aldrin, dieldrin, chlordane, endrin, heptachlor, heptachlor epoxide, hexachlorocyclohexane (including lindane), endosulfan, and toxaphene), mercury, polychlorinated biphenyls, and unknown toxicity in the 303(d) list of impaired water bodies. This Order includes monitoring requirements for mercury, and unknown toxicity. This Order includes effluent limitations for mercury and toxicity for both Discharge 001 and Discharge 002. The reasoning for these effluent limitations is explained in the Fact Sheet.

Requirements of this Order implement the Basin Plan.

I. National Toxics Rule (NTR) and California Toxics Rule (CTR). USEPA adopted the NTR on 22 December 1992, and later amended it on 4 May 1995 and 9 November 1999. About forty criteria in the NTR applied in California. On

18 May 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on 13 February 2001. These rules contain water quality criteria for priority pollutants.

J. State Implementation Policy. On March 2, 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 USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plan. The SIP became effective on 18 May 2000 with respect to the priority pollutant criteria promulgated by the USEPA through the CTR. The State Water Board adopted amendments to the SIP on 24 February 2005 that became effective on 13 July 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this Order implement the SIP.

K. Compliance Schedules and Interim Requirements. In general, an NPDES permit must include final effluent limitations that are consistent with Clean Water Act section 301 and with 40 CFR 122.44(d). There are exceptions to this general rule. The State Water Board has concluded that where the Regional Water Board's Basin Plan allows for schedules of compliance and the Regional Water Board is newly interpreting a narrative standard, it may include schedules of compliance in the permit to meet effluent limits that implement a narrative standard. See In the Matter of Waste Discharge Requirements for Avon Refinery (State Board Order WQ 2001-06 at pp. 53-55). See also Communities for a Better Environment et al. v. State Water Resources Control Board, 34 Cal.Rptr.3d 396, 410 (2005). The Basin Plan for the Sacramento and San Joaquin Rivers includes a provision that authorizes the use of compliance schedules in NPDES permits for water quality objectives that are adopted after the date of adoption of the Basin Plan, which was 25 September 1995 (See Basin Plan at page IV-16). Consistent with the State Water Board's Order in the CBE matter, the Regional Water Board has the discretion to include compliance schedules in NPDES permits when it is including an effluent limitation that is a "new interpretation" of a narrative water quality objective. This conclusion is also consistent with the United States Environmental Protection Agency (USEPA) policies and administrative decisions (for example, the USEPA Whole Effluent Toxicity (WET) Control Policy.) The Regional Water Board, however, is not required to include a schedule of compliance, but may issue a Time Schedule Order pursuant to Water Code section 13300 or a Cease and Desist Order pursuant to Water Code section 13301 where it finds that the discharger is violating or threatening to violate the permit. The Regional Water Board will consider the merits of each case in determining whether it is appropriate to include a compliance schedule in a permit, and, consistent with the Basin Plan, should consider feasibility of achieving compliance, and must impose a schedule that is as short as practicable to achieve compliance with the objectives, criteria, or effluent limit based on the objective or criteria.

For CTR constituents, section 2.1 of the SIP provides that, based on a Discharger's request and demonstration that it is infeasible for an existing Discharger to achieve immediate compliance with an effluent limitation derived from a CTR criterion,

compliance schedules may be allowed in an NPDES permit. Unless an exception has been granted under section 5.3 of the SIP, a compliance schedule may not exceed 5 years from the date that the permit is issued or reissued, nor may it extend beyond 10 years from the effective date of the SIP (or 18 May 2010) to establish and comply with CTR criterion-based effluent limitations. Where a compliance schedule for a final effluent limitation that exceeds 1 year, the Order must include interim numeric limitations for that constituent or parameter. Where allowed by the Basin Plan, compliance schedules and interim effluent limitations or discharge specifications may also be granted to allow time to implement a new or revised water quality objective. This Order includes compliance schedules and interim effluent limitations and/or discharge specifications. A detailed discussion of the basis for the compliance schedule(s) and interim effluent limitation(s) and/or discharge specifications is included in the Fact Sheet.

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

M. Stringency of Requirements for Individual Pollutants. This Order contains both technology-based and water quality-based effluent limitations for individual pollutants. The technology-based effluent limitations consist of restrictions on BOD_5 and TSS. The water quality-based effluent limitations include restrictions on turbidity and pathogens. This Order's technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements. In addition, this Order contains effluent limitations more stringent than the minimum, federal technology-based requirements that are necessary to meet water quality standards. These limitations are more stringent than required by the CWA. Specifically, this Order includes effluent limitations for BOD, TSS, turbidity and pathogens that are more stringent than applicable federal standards, but that are nonetheless necessary to meet numeric objectives or protect beneficial uses. The rationale for including these limitations is explained in the Fact Sheet. In addition, the Regional Water Board has considered the factors in Water Code section 13241 in establishing these requirements.

Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that toxic pollutant water quality-based effluent limitations were derived from the CTR, the CTR is the applicable standard pursuant to 40 CFR section 131.38. The scientific procedures for calculating the individual water quality-based effluent limitations are based on the CTR-SIP, which was approved by USEPA on 1 May 2001 and amended in September 2005. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to 30 May 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to 30 May 2000,

but not approved by USEPA before that date, are nonetheless "*applicable water quality standards for purposes of the [Clean Water] Act*" pursuant to 40 CFR section 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the technology-based requirements of the CWA and the applicable water quality standards for purposes of the CWA.

N. Antidegradation Policy. 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 No. 68-16. Resolution No. 68-16 is consistent with the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the state and federal antidegradation policies. As discussed in detail in the Fact Sheet the permitted discharge is consistent with the antidegradation provision of section 131.12 and State Water Board Resolution No. 68-16.

O. Anti-Backsliding Requirements. Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at title 40, Code of Federal Regulations section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. Some effluent limitations in this Order are less stringent than those in the previous Order. As discussed in detail in the Fact Sheet this relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.

P. Tertiary Treatment Requirements. The beneficial uses of the Yolo Bypass include water contact recreation and agricultural irrigation supply, and there is at times, less than 20:1 dilution. To protect these beneficial uses, the Regional Water Board finds that wastewater must be disinfected and adequately treated to prevent disease. Tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites in the waste stream. The Regional Board finds that wastewater must be treated to tertiary standards (filtered), or equivalent, to protect contact recreational and food crop irrigation uses.

Q. Salinity Limitations. This Order contains interim effluent limitations for electrical conductivity (EC). This Order requires the Discharger to study appropriate EC, boron, sodium, and chloride levels to protect agricultural beneficial use in areas irrigated with water from the Willow Slough Bypass, Conaway Ranch Toe Drain, and/or Yolo Bypass diverted downstream from the discharge. A final EC effluent limitation will be included in the subsequent renewal of this Order. Final boron, chloride, and/or sodium effluent limitations will also be included in the subsequent renewal of the Order if they are determined to have reasonable potential and cannot be adequately regulated by the EC effluent limitation.

R. Monitoring and Reporting. Section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorizes the Regional Water Board to require technical and

monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement federal and State requirements. This Monitoring and Reporting Program is provided in Attachment E.

S. Standard and Special Provisions. Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with 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. The Regional Water Board has also included in this Order special provisions applicable to the Discharger. A rationale for the special provisions contained in this Order is provided in the attached Fact Sheet.

California Water Code section 13263.3(d) allows the Regional Water Board to require a discharger to complete and implement a pollution prevention plan under specific situations. This Order requires pollution prevention plans for cyanide, selenium, aluminum, and iron, consistent with CWC 13263.3(d)(1)(D). The rationale for the requirement to provide pollution prevention plans for these constituents is included in the Fact Sheet. The Pollution Prevention Plan required herein is not incorporated by reference into this Order.

T. Provisions and Requirements Implementing State Law. The provisions/requirements in subsections IV.B, IV.C, V.B, and VI.C. of this Order are included to implement state law only. These provisions/requirements are not required or authorized under the federal CWA; consequently, violations of these provisions/requirements are not subject to the enforcement remedies that are available for NPDES violations.

U. Notification of Interested Parties. The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet of this Order.

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

III. DISCHARGE PROHIBITIONS

A. Discharge of wastewater at a location or in a manner different from that described in the Findings is prohibited.

B. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Federal Standard Provisions I.G. and I.H. (Attachment D).

C. Neither the discharge nor its treatment shall create a nuisance as defined in section 13050 of the California Water Code.

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

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations – Discharge Points 001, 002

1. Final Effluent Limitations – Discharge Point 001

The Discharger shall maintain compliance with the following effluent limitations at Discharge Point 001, with compliance measured at EFF-001 as described in the attached MRP (Attachment E), unless otherwise specified:

a. The Discharger shall maintain compliance with the effluent limitations specified in Table 6a:

Table 6a. Effluent Limitations - Discharge Point 001

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
BOD 5-day @ 20°C[1]	mg/L	10	15	20		
	lbs/day[2]	630	940	1300		
Total Suspended Solids[1]	mg/L	10	15	20		
	lbs/day[2]	630	940	1300		
pH	standard units				6.5	8.0~~8.5~~
Settleable Solids[1]	mL/L	0.1		0.2		
Turbidity[1]	NTU					10
Total Coliform Organisms[1]	MPN/100 mL					240
Aluminum, Total Recoverable[3]	ug/L	71		140		
Ammonia (1 March – 31 October)	mg/L	1.6~~0.43~~		3.8~~1.04~~		
	lbs/day[2]	100~~26.9~~		240~~65.1~~		
Ammonia (1 November– 29 February)	mg/L	2.2~~0.52~~		3.3~~1.04~~		
	lbs/day[2]	140~~32.5~~		210~~65.1~~		
Cyanide	ug/L	3.8		9.5		
Iron, Total Recoverable	mg/L	0.8		2		
Selenium, Total Recoverable	ug/L	4.4		7.1		
	lbs/day[2]	0.28		0.44		

1. Compliance is to be measured at Monitoring Location EFF-A as described in the attached MRP.
2. Based on an average dry weather flow of 7.5 mgd.
3. Compliance with the effluent limitations for aluminum can be demonstrated using either total or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods, as supported by USEPA's Ambient Water Quality Criteria for Aluminum document (EPA 440/5-86-008), or other standard methods that exclude aluminum silicate particles as approved by the Executive Officer.

b. **Percent Removal.** Effective 25 October 2017, the average monthly percent removal of BOD 5-day 20°C and total suspended solids shall not be less than 85 percent.

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

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

d. **Mercury.** The total monthly mass discharge of total mercury shall not exceed 0.038 lbs/month.

e. **Temperature.** The maximum temperature of the discharge shall not exceed the natural receiving water temperature by more than 20°F.

f. **Total Residual Chlorine[2].** Effluent total residual chlorine shall not exceed:

i. 0.01 mg/L, as a 4-day average; and
ii. 0.02 mg/L, as a 1-hour average.

g. **Turbidity.** Effective 25 October 2017, effluent turbidity shall not exceed:

i. 2 NTU, as a daily average; and
ii. 5 NTU, more than 5% of the time within a 24-hour period.

h. **Total Coliform Organisms.** Effective 25 October 2017, effluent total coliform organisms shall not exceed:

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

i. **Tertiary Treatment.** Effective 25 October 2017, wastewater shall be oxidized, coagulated, filtered, and adequately disinfected pursuant to the Department of Public Health (DPH) reclamation criteria, California Code of Regulations, Title 22, Division 4, Chapter 3, (Tile 22) or equivalent.

j. **Average Dry Weather Discharge Flow.** The Average Dry Weather Discharge Flow shall not exceed 7.5 million gallons per day as a total from Discharge 001 and Discharge 002.

k. **Chronic Whole Effluent Toxicity.** There shall be no chronic toxicity in the effluent discharge.

[2] Compliance is to be measured at Monitoring Location EFF-A as described in the attached MRP.

2. Final Effluent Limitations – Discharge Point 002

The Discharger shall maintain compliance with the following effluent limitations at Discharge Point 002, with compliance measured at Monitoring Location EFF-002, as described in the attached MRP (Attachment E), unless otherwise specified:

a. The Discharger shall maintain compliance with the effluent limitations specified in Table 6b:

Table 6b. Effluent Limitations - Discharge Point 002

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
BOD 5-day @ 20°C[1]	mg/L	10	15	20		
	lbs/day[2]	630	940	1300		
Total Suspended Solids[1]	mg/L	10	15	20		
	lbs/day[2]	630	940	1300		
pH	standard units				6.5	8.0~~8.5~~
Settleable Solids[1]	mL/L	0.1		0.2		
Turbidity[1]	NTU					10
Total Coliform Organisms[1]	MPN/100 mL					240
Aluminum, Total Recoverable[3]	ug/L	71		140		
Ammonia (1 March – 31 October)	mg/L	2.1~~0.46~~		4.8~~1.11~~		
	lbs/day[2]	130~~28.8~~		300~~69.4~~		
Ammonia (1 November– 29 February)	mg/L	2.9~~0.67~~		5.6~~1.47~~		
	lbs/day[2]	180~~41.9~~		350~~91.9~~		
Copper, Total Recoverable	ug/L	16		34		
Iron, Total Recoverable	mg/L	0.8		2		
Selenium, Total Recoverable	ug/L	4.4		7.2		
	lbs/day[2]	0.28		0.45		

1. Compliance is to be measured at Monitoring Location EFF-A as described in the attached MRP.
2. Based on an average dry weather discharge flow of 7.5 mgd.
3. Compliance with the effluent limitations for aluminum can be demonstrated using either total or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods, as supported by USEPA's Ambient Water Quality Criteria for Aluminum document (EPA 440/5-86-008), or other standard methods that exclude aluminum silicate particles as approved by the Executive Officer.

b. **Percent Removal:** Effective 25 October 2017, the average monthly percent removal of BOD 5-day 20°C and total suspended solids shall not be less than 85 percent.

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

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

d. **Mercury.** The total monthly mass discharge of total mercury shall not exceed 0.038 lbs/month.

e. **Temperature.** The maximum temperature of the discharge shall not exceed the natural receiving water temperature by more than 20°F.

f. **Total Residual Chlorine[3].** Effluent total residual chlorine shall not exceed:

i. 0.01 mg/L, as a 4-day average;
ii. 0.02 mg/L, as a 1-hour average; and

g. **Turbidity.** Effective 25 October 2017, effluent turbidity shall not exceed:

i. 2 NTU, as a daily average; and
ii. 5 NTU, more than 5% of the time within a 24-hour period.

h. **Total Coliform Organisms.** Effective 25 October 2017, effluent total coliform organisms shall not exceed:

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

i. **Tertiary Treatment.** Effective 25 October 2017, wastewater shall be oxidized, coagulated, filtered, and adequately disinfected pursuant to the DPH reclamation criteria, Title 22 California Code of Regulations, Division 4, Chapter 3, (Tile 22) or equivalent.

j. **Average Dry Weather Discharge Flow.** The Average Dry Weather Discharge Flow shall not exceed 7.5 million gallons per day as a total from Discharge 001 and Discharge 002.

k. **Chronic Whole Effluent Toxicity.** There shall be no chronic toxicity in the effluent discharge.

3. Interim Effluent Limitations – Discharge Point 001

a. During the period beginning on the effective date of this Order and ending on October 25, 2017, the Discharger shall maintain compliance with the following limitations at D-001, with compliance measured at Monitoring Location EFF-001 as described in the attached MRP, unless otherwise specified. 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.

[3] Compliance is to be measured at Monitoring Location EFF-A as described in the attached MRP.

Table 7a. Interim non-CTR Effluent Limitations – Discharge Point 001

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	~~Annual Average~~ Instantaneous Minimum	Instantaneous Maximum
BOD 5-day @ 20°C[1]	mg/L	30	45	90		
	lbs/day[2]	1876	2815	5633		
Total Suspended Solids[1]	mg/L	50	75	150		
	lbs/day[2]	3129	4694	9388		
pH	standard units				6.5	8.5
Turbidity[1,3]	NTU					
Total Coliform Organisms[1]	MPN/100 mL					500
Aluminum, Total Recoverable[4]	ug/L			2200		
Ammonia	mg/L			20.5		
	lbs/day[2]			1280		
Iron, Total Recoverable	mg/L			4.0		

1. Compliance is to be measured at Monitoring Location EFF-A as described in the attached MRP.
2. Based on an average dry weather discharge flow of 7.5 mgd.
3. No limitation for turbidity during the period beginning on the effective date of this Order and ending on October 25, 2017.
4. Compliance with the effluent limitations for aluminum can be demonstrated using either total or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods, as supported by USEPA's Ambient Water Quality Criteria for Aluminum document (EPA 440/5-86-008), or other standard methods that exclude aluminum silicate particles as approved by the Executive Officer.

b. During the period beginning on the effective date of this Order and ending 18 May 2010, the Discharger shall maintain compliance with the following limitations at D-001, with compliance measured at Monitoring Location EFF-001 as described in the attached MRP. These interim effluent limitations shall apply in lieu of all final effluent limitations specified for the same parameters during the time period indicated in this provision.

Table 7b. Interim CTR Effluent Limitations – Discharge Point 001

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Annual Average	Instantaneous Maximum
Cyanide	ug/L			9.6		
Selenium, Total Recoverable	ug/L			7.1		
	lbs/day[1]			0.44		

1. Based on an average dry weather discharge flow of 7.5 mgd.

c. The Discharger shall maintain compliance with the following limitation at D-001, with compliance measured at Monitoring Location EFF-A as described in the attached MRP.

Electrical Conductivity. The electrical conductivity shall not exceed 2050 umhos/cm as an annual average.

4. Interim Effluent Limitations – Discharge Point 002

a. During the period beginning on the effective date of this Order and ending on October 25, 2017, the Discharger shall maintain compliance with the following limitations at D-002, with compliance measured at Monitoring Location EFF-002 as described in the attached MRP, unless otherwise specified. These interim effluent limitations shall apply in lieu of all final effluent limitations specified for the same parameters during the time period indicated in this provision.

Table 7c. Interim non-CTR Effluent Limitations – Discharge Point 002

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum ~~Annual Average~~	Instantaneous Maximum
BOD 5-day @ 20°C[1]	mg/L	30	45	90		
	lbs/day[2]	1876	2815	5633		
Total Suspended Solids[1]	mg/L	50	75	150		
	lbs/day[2]	3129	4694	9388		
pH	standard units				6.5	8.5
Turbidity[1,3]	NTU					
Total Coliform Organisms[1]	MPN/100 mL					500
Aluminum, Total Recoverable[4]	ug/L			6500		
Ammonia	mg/L			13.2		
	lbs/day[2]			826		
Iron, Total Recoverable	mg/L			14		

1. Compliance is to be measured at Monitoring Location EFF-A as described in the attached MRP.
2. Based on an average dry weather discharge flow of 7.5 mgd.
3. No limitation for turbidity during the period beginning on the effective date of this Order and ending on October 25, 2017.
4. Compliance with the effluent limitations for aluminum can be demonstrated using either total or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods, as supported by USEPA's Ambient Water Quality Criteria for Aluminum document (EPA 440/5-86-008), or other standard methods that exclude aluminum silicate particles as approved by the Executive Officer.

b. During the period beginning on the effective date of this Order and ending 18 May 2010, the Discharger shall maintain compliance with the following limitations at D-002, with compliance measured at Monitoring Location EFF-002 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.

Table 7d. Interim CTR Effluent Limitations – Discharge Point 002

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Annual Average	Instantaneous Maximum
Selenium, Total Recoverable	ug/L			7.2		
	lbs/day[1]			0.45		

1. Based on an average dry weather discharge flow of 7.5 mgd.

c. The Discharger shall maintain compliance with the following limitation at D-002, with compliance measured at Monitoring Location EFF-A as described in the attached MRP:

Electrical Conductivity. The electrical conductivity shall not exceed 2050 umhos/cm as an annual average.

B. Land Discharge Specifications

1. The discharge of waste classified as "hazardous" as defined in section 2521(a) of Title 23, California Code of Regulations (CCR), or "designated", as defined in section 13173 of the CWC, to the treatment ponds is prohibited.

2. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the wastewater treatment and disposal areas or property owned by the Discharger.

3. As a means of discerning compliance with Land Discharge Specification 2, the dissolved oxygen content in the upper zone (1 foot) of wastewater in ponds shall not be less than 1.0 mg/L.

4. Effluent entering the ponds shall not have a pH less than 6.5 or greater than 9.0.

C. Reclamation Specifications – NOT APPLICABLE

D. Wetlands Specifications

a. If ~~T~~the geometric mean selenium concentration in avian eggs ~~shall not~~ exceeds 4 ug/g (dry weight basis) in any one sampling period.~~. If the selenium concentration is exceeded~~ the Discharger shall submit a remedial action workplan to reduce the concentrations in avian eggs. The workplan shall be implemented immediately upon approval of the Executive Officer.

b. If ~~T~~the geometric mean selenium concentration in avian eggs ~~shall not~~ exceeds 8 ug/g (dry weight basis) in any one sampling period.~~. If the selenium concentration is exceeded,~~ the Discharger shall immediately cease the discharge of wastewater into the wetlands. Wastewater shall not be reintroduced until it can be shown to the satisfaction of the Executive Officer that the concentrations have been sufficiently reduced to protect wildlife and maintain the mean avian egg selenium concentration below 8 ug/g.

c. Toxic pollutants shall not be present in the water column, sediments, or biota in concentrations that produce detrimental response in human, plant, animal, or aquatic life; or that bioaccumulate in concentrations that are harmful to human health or aquatic resources. The discharge into the wetlands shall not cause aquatic communities and populations, including vertebrate, invertebrate and plant species, to be degraded as determined by acute or chronic toxicity analysis, wetlands monitoring or technical reports required by the Executive Officer.

d. The wetlands must be managed so as not to create vector problems and to minimize the occurrence of avian botulism and other infectious diseases. The local mosquito abatement district or Yolo County Environmental Health Department shall be consulted annually to determine if changes need to be made in procedures in managing the wetlands for vector control.

E. Biosolids Specifications

a. The direct or indirect discharge of screenings, residual sludge, harvested lemna vegetation, biosolids, and other solids removed from liquid wastes to surface waters or surface water drainage courses, or to the wetlands is prohibited.

b. Effective 1 December 2008, the direct or indirect discharge of screenings, residual sludge, harvested lemna vegetation, biosolids, and other solids removed from liquid wastes to the overland flow fields is prohibited.

c. The discharge of waste classified as “hazardous” or “designated” as defined in Section 2521 (a) and Section 2522 (a) of Chapter 15, is prohibited.

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

Receiving water limitations are based on water quality objectives contained in the Basin Plan and are a required part of this Order. The discharge shall not cause the following in the Willow Slough Bypass and/or Conaway Ranch Toe Drain:

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 ten percent of the total number of fecal coliform samples taken during any 30-day period to exceed 400 MPN/100 mL.

2. **Biostimulatory Substances.** Water to contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.

3. **Chemical Constituents.** Chemical constituents to be present in concentrations that adversely affect beneficial uses.

4. **Color.** Discoloration that causes nuisance or adversely affects beneficial uses.

5. **Dissolved Oxygen:**

   a. The monthly median of the mean daily dissolved oxygen concentration to fall below 85 percent of saturation in the main water mass;
   b. The 95 percentile dissolved oxygen concentration to fall below 75 percent of saturation; nor

c. The dissolved oxygen concentration to be reduced below 7.0 mg/L at any time.

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

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

8. **pH.** The pH to be depressed below 6.5 nor, raised above 8.5., ~~nor changed by more than 0.5 units. A one-month averaging period may be applied when calculating the pH change of 0.5 units.~~

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.

10. **Radioactivity:**

    a. Radionuclides to be present in concentrations; that are harmful to human, plant, animal, or aquatic life; or that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.

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 natural temperature to be increased by more than 5°F. Compliance to be determined based on the difference in temperature at RSW-001U and RSW-001D and/or RSW-002U and RSW-002D.

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.** The turbidity to increase as follows:

    a. More than 1 Nephelometric Turbidity Unit (NTU) where natural turbidity is between 0 and 5 NTUs.
    b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.
    c. More than 10 NTU where natural turbidity is between 50 and 100 NTUs.
    d. More than 10 percent where natural turbidity is greater than 100 NTUs.

    Compliance to be determined based on the difference in turbidity at RSW-001U and RSW-001D and/or RSW-002U and RSW-002D.

B. Groundwater Limitations

The discharge shall not cause the groundwater to exceed water quality objectives, unreasonably affect beneficial uses, or cause a condition of pollution or nuisance.

Release of waste constituents from any storage, treatment, or disposal component associated with the WWTP shall not, in combination with other sources of the waste constituents, cause groundwater within influence of the WWTP to contain waste constituents in concentrations in excess of natural background quality or that listed below, whichever is greater:

a. Total coliform organisms median of 2.2 MPN/100 mL over any seven-day period.
b. Chemical constituents in concentrations that adversely affect beneficial uses, including the constituent concentration listed below:

Parameter	Units	Limitation
Nitrate (as N)	mg/L	10

VI. PROVISIONS

A. Standard Provisions

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

2. The Discharger shall comply with the following provisions:

a. If the Discharger's wastewater treatment plant is publicly owned or subject to regulation by California Public Utilities Commission, it shall be supervised and operated by persons possessing certificates of appropriate grade according to Title 23, CCR, Division 3, Chapter 26.

b. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:

   i. violation of any term or condition contained in this Order;

   ii. obtaining this Order by misrepresentation or by failing to disclose fully all relevant facts;

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

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

   The causes for modification include:

   - *New regulations.* New regulations have been promulgated under section 405(d) of the Clean Water Act, 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 Code of Federal Regulations (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 Regional Water Board may review and revise this Order at any time upon application of any affected person or the Regional Water Board's own motion.

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

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

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

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

   ii. controls any pollutant limited in the Order.

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

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

f. The Discharger shall take all reasonable steps to minimize any adverse effects to waters of the State or users of those waters resulting from any discharge or sludge use or disposal in violation of this Order. Reasonable steps shall include such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge or sludge use or disposal.

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

h. The discharge of any radiological, chemical or biological warfare agent or high-level, radiological waste is prohibited.

i. 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.

j. 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 Regional 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 five years on effluent quality and on the capability of the Discharger to comply with the terms and conditions of the Order. The adequacy of the safeguards is subject to the approval of the Regional Water Board.

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

k. The Discharger, upon written request of the Regional Water Board, shall file with the Board a technical report on its preventive (failsafe) and contingency (cleanup) plans for controlling accidental discharges, and for minimizing the effect of such events. This report may be combined with that required under Regional Water Board Standard Provision VI.A.2.m.

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 Regional 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.

l. A publicly owned treatment works (POTW) 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 three 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 four years, the Discharger shall notify the Regional 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 Regional Water Board may extend the time for submitting the report.

m. 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.

n. Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the Regional Water Board and USEPA.

o. The Discharger shall conduct analysis on any sample provided by USEPA as part of the Discharge Monitoring Quality Assurance (DMQA) program. The results of any such analysis shall be submitted to USEPA's DMQA manager.

p. 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.

q. All monitoring and analysis 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.

r. The Discharger shall file with the Regional Water Board technical reports on self-monitoring performed according to the detailed specifications contained in the Monitoring and Reporting Program attached to this Order.

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

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

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

v. 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 Regional Water Board by telephone (916) 464-3291 within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within five days, unless the Regional Water Board waives confirmation. The written notification shall include the information required by Attachment D, Section V.E.1 [40 CFR section 122.41(l)(6)(i)].

B. Monitoring and Reporting Program (MRP) Requirements

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

C. Special Provisions

1. Reopener Provisions

a. 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.

b. Conditions that necessitate a major modification of a permit are described in 40 CFR section 122.62, including:

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

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

c. **Mercury.** If mercury is found to be causing toxicity based on acute or chronic toxicity test results, or if a TMDL program is adopted, this Order may be reopened and the effluent mass limitation modified or an effluent concentration limitation imposed. If the Regional Water Board determines that a mercury offset program is feasible for Dischargers subject to an NPDES permit, then this Order may be reopened to reevaluate the interim mercury mass loading limitation(s) and the need for a mercury offset program for the Discharger.

d. **Pollution Prevention.** This Order requires the Discharger to prepare and implement pollution prevention plans following CWC section 13263.3(d)(3) for cyanide, selenium, aluminum, and iron. 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 these constituents. The Pollution Prevention Plan required herein is not incorporated by reference into this Order.

e. **Whole Effluent Toxicity.** As a result of a Toxicity Reduction Evaluation (TRE), this Order may be reopened to include a chronic toxicity limitation, a new acute toxicity limitation, and/or a limitation for a specific toxicant identified in the TRE. Additionally, if the State Water Board revises the SIP's toxicity control provisions that would require the establishment of numeric chronic toxicity effluent limitations, this Order may be reopened to include a numeric chronic toxicity effluent limitation based on the new provisions.

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 additional site-specific dissolved-to-total metal translators, this Order may be reopened to modify the effluent limitations for the applicable inorganic constituents.

g. **Ammonia.** Floating Ammonia Effluent Concentration Limitations. If Regional Water Board staff determines that floating ammonia effluent limitations (based on pH and Temperature of the effluent and/or receiving water) are appropriate, this Order may be reopened to include revised final ammonia effluent limitations and monitoring requirements.

h. **Constituent Study.** If after review of the study results it is determined that the discharge has reasonable potential to cause or contribute to an exceedance of a water quality objective this Order may be reopened and effluent limitations added for the subject constituents.

i. **Manganese Study.** This Order requires the Discharger to complete and submit a report on the results of a site-specific investigation of appropriate manganese levels to protect agricultural beneficial use in areas irrigated with water from the Willow Slough Bypass, Conaway Ranch Toe Drain, and/or Yolo Bypass diverted downstream from the discharge. Based on a review of the results of the Manganese Study, this Order may be reopened to add final effluent limitations for manganese.

j. **EC, Boron, Sodium, and Chloride Study.** This Order requires the Discharger to complete and submit a report on the results of a site-specific investigation of appropriate EC, boron, sodium, and chloride levels to protect agricultural beneficial use in areas irrigated with water from the Willow Slough Bypass, Conaway Ranch Toe Drain, and/or Yolo Bypass diverted downstream from the discharge. Based on a review of the results of the EC, Boron, Sodium, and Chloride Study, this Order may be reopened to add final effluent limitations for EC, boron, sodium, and chloride.

k. **Reuse Feasibility Study.** This Order requires the Discharger to complete and submit a report on the results of a feasibility evaluation for the reuse of treated effluent on the Conaway Ranch. Based on a review of the results of the Reuse

Feasibility Study, this Order may be reopened to include additional requirements and/or to amend compliance dates to implement reuse on the Conaway Ranch if the Discharger determines that reuse is feasible.

2. Special Studies, Technical Reports and Additional Monitoring Requirements

a. **Chronic Whole Effluent Toxicity.** For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct chronic whole effluent toxicity testing, as specified in the Monitoring and Reporting Program (Attachment E, Section V.). Furthermore, this Provision requires the Discharger to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity. If the discharge exceeds the toxicity numeric monitoring trigger 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 reoccurrence of toxicity. A TRE is a site-specific study conducted in a stepwise process to identify the source(s) of toxicity and the effective control measures for effluent toxicity. TREs are designed to identify the causative agents and sources of whole effluent toxicity, evaluate the effectiveness of the toxicity control options, and confirm the reduction in effluent toxicity. This Provision includes requirements for the Discharger to develop and submit a TRE Work Plan and includes procedures for accelerated chronic toxicity monitoring and TRE initiation.

i. **Toxicity Reduction Evaluation (TRE) Work Plan. Within 90 days of the effective date of this Order,** the Discharger shall submit to the Regional Water Board a TRE Work Plan for approval by the Executive Officer. The TRE Work Plan shall outline the procedures for identifying the source(s) of, and reducing or eliminating effluent toxicity. The TRE Work Plan must be developed in accordance with EPA guidance[4] and be of adequate detail to allow the Discharger to immediately initiate a TRE as required in this Provision.

ii. **Accelerated Monitoring and TRE Initiation.** When the numeric toxicity monitoring trigger is exceeded during regular chronic toxicity monitoring, and the testing meets all test acceptability criteria, the Discharger shall initiate accelerated monitoring as required in the Accelerated Monitoring Specifications. WET testing results exceeding the monitoring trigger during accelerated monitoring demonstrates ~~a pattern of~~ toxicity and requires the Discharger to initiate a TRE to address the effluent toxicity.

iii. **Numeric Monitoring Trigger.** The numeric toxicity monitoring trigger 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.

[4]See Attachment F (Fact Sheet) Section VII.B.2.a. for a list of EPA guidance documents that must be considered in development of the TRE Workplan.

iv. **Accelerated Monitoring Specifications.** If the monitoring trigger is exceeded during regular chronic toxicity testing, within 14-days of notification by the laboratory of the test results, the Discharger shall initiate accelerated monitoring. Accelerated monitoring shall consist of four (4) chronic toxicity tests in a six-week period (i.e. one test 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 (4) consecutive accelerated monitoring tests do not exceed the monitoring trigger, the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring. However, notwithstanding the accelerated monitoring results, if there is adequate evidence of ~~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 (i.e. temporary plant upset), the Discharger shall make necessary corrections to the facility and shall continue accelerated monitoring until four (4) consecutive accelerated tests do not exceed the monitoring trigger. Upon confirmation that the effluent toxicity has been removed, the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring.

c) If the result of any accelerated toxicity test exceeds the monitoring trigger, the Discharger shall cease accelerated monitoring and initiate 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 the test results exceeding the monitoring trigger during accelerated monitoring, the Discharger shall submit a TRE Action Plan to the Regional Water Board including, at minimum:

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

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

3) A schedule for these actions.

b. **Constituent Study.** There are indications that the discharge may contain constituents that have a reasonable potential to cause or contribute to an exceedance of water quality objectives: fluoride and nickel for both Discharge 001 and Discharge 002, zinc, lead, oil and grease, and diethyl phthalate for Discharge 001, and acrolein, cyanide, and persistent chlorinated hydrocarbon pesticides for Discharge 002. The Discharger shall comply with the following time schedule in conducting a study of these constituents' potential effect in surface waters:

Task	Compliance Date
Submit Workplan and Time Schedule	Within 6 months of effective date of this Order
Begin Study	Upon approval by the Executive Officer
Complete Study	Within two years following Workplan approval
Submit Study Report	Within three months of completion of study

c. **Manganese Study.** The Discharger shall complete and submit a report on the results of a site-specific investigation of appropriate manganese levels to protect agricultural beneficial use in areas irrigated with water from the Willow Slough Bypass, Conaway Ranch Toe Drain, and/or Yolo Bypass diverted downstream from the discharge. The study shall evaluate how soil chemistry affects manganese requirements and recommend site-specific numeric values for manganese that fully protect agricultural uses.

Task	Compliance Date
Submit Workplan and Time Schedule	Within 12 months of adoption date of this Order
Complete Study	Within three years of adoption date of this Order
Submit Study Report	Within three months of completion of study

d. **EC, Boron, Sodium, and Chloride Study:** The Discharger shall complete and submit a report on the results of a site-specific investigation of appropriate EC, boron, sodium, and chloride levels to protect agricultural beneficial use in areas irrigated with water from the Willow Slough Bypass, Conaway Ranch Toe Drain, and/or Yolo Bypass diverted downstream from the discharge. The study shall determine the sodium adsorption ratio of soils in the affected area, the effects of rainfall and flood-induced leaching, and background water quality. The study shall evaluate how climate, soil chemistry, background water quality, rainfall, and flooding affect EC, boron, sodium, and chloride requirements. Based on these factors, the study shall recommend site-specific numeric values for EC, boron, sodium, and chloride that fully protect agricultural uses.

The Discharger shall comply with the following time schedule to complete the study:

Task	Compliance Date
Submit Workplan and Time Schedule	~~Within 12 months of adoption date of this Order~~ 1 February 2011
Complete Study	~~Within three years of adoption date of this Order~~27 February 2015
Submit Study Report	Within three months of completion of study

In lieu of completing a site-specific study, if appropriate, the Discharger may submit a report showing it has implemented EC study results from other dischargers in the area (e.g., City of Woodland).

e. **Best Practicable Treatment or Control (BPTC) Evaluation Tasks**. The Discharger shall propose a work plan and schedule for providing BPTC as required by Resolution 68-16. The technical report describing the work plan and schedule shall contain a preliminary evaluation of each component and propose a time schedule for completing the comprehensive technical evaluation.

Following completion of the comprehensive technical evaluation, the Discharger shall submit a technical report describing the evaluation's results and critiquing each evaluated component with respect to BPTC and minimizing the discharge's impact on groundwater quality. Where deficiencies are documented, the technical report shall provide recommendations for necessary modifications (*e.g.*, new or revised salinity source control measures, lining the ponds, lining the sludge lagoons, WWTP component upgrade and retrofit) to achieve BPTC and identify the source of funding and proposed schedule for modifications. The schedule shall be as short as practicable but in no case shall completion of the necessary modifications exceed four years past the Executive Officer's determination of the adequacy of the comprehensive technical evaluation, unless the schedule is reviewed and specifically approved by the Regional Water Board. The technical report shall include specific methods the Discharger proposes as a means to measure processes and assure continuous optimal performance of BPTC measures. The Discharger shall comply with the following compliance schedule in implementing the work required by this Provision:

Task	Compliance Date
1 Submit technical report: work plan and schedule for comprehensive evaluation	**Within 6 months** following Order adoption
2 Commence comprehensive evaluation	**30 days** following Executive Officer approval of Task 1.
3 Complete comprehensive evaluation	~~30 November 2012~~**2 years and 8 months** following commencement of Task 2.
4 Submit technical report: comprehensive evaluation results	**60 days** following completion of Task 3.
5 Submit annual report describing the overall status of BPTC implementation and compliance with groundwater limitations over the past reporting year	To be submitted in accordance with the MRP (Attachment E, Section IX.D.1.)

f. **Groundwater Monitoring.** To determine compliance with Groundwater Limitations V.B., the groundwater monitoring network shall include one or more background monitoring wells and a sufficient number of designated monitoring wells downgradient of every treatment, storage, and disposal unit that does or may release waste constituents to groundwater. All monitoring wells shall comply with the appropriate standards as described in California Well Standards Bulletin 74-90 (June 1991) and Water Well Standards: State of California Bulletin 74-81 (December 1981), and any more stringent standards adopted by the Discharger or County pursuant to CWC section 13801.

The Discharger must evaluate the need for additional background groundwater quality data to evaluate degradation associated with the existing treatment facility and proposed wastewater reuse site. The Discharger must also consider additional groundwater monitoring wells as necessary for this evaluation. The Discharger, after two years of monitoring, shall characterize natural background quality of monitored constituents in a technical report, to be submitted by ~~1 September 2010~~1 ~~February~~September 2012. For each groundwater monitoring parameter/constituent identified in the Monitoring and Reporting Program (Attachment E, Section VII.B.), the report shall present a summary of monitoring data, calculation of the concentration in background monitoring wells, and a comparison of background groundwater quality to that in wells used to monitor the facility. Determination of background quality shall be made using the methods described in Title 27 California Code of Regulations Section 20415(e)(10), and shall be based on data from at least four consecutive quarterly (or more frequent) groundwater monitoring events. For each monitoring parameter/constituent, the report shall compare measured concentrations for compliance monitoring wells with the calculated background concentration.

If the monitoring shows that any constituent concentrations are increased above background water quality, the Discharger shall submit a technical report ~~by 1 September 2011~~30 November 2012 describing the groundwater technical report results and critiquing each evaluated component of the Facility with respect to BPTC and minimizing the discharge's impact on groundwater quality. This technical report must be submitted according to the schedule described in Section VI.C.2.e of this Order. In no case shall the discharge be allowed to exceed the Groundwater Limitations. This Order may be reopened and additional groundwater limitations added.

g. **Reuse Feasibility Study.** To determine the feasibility of reusing treated effluent at the Conaway Ranch and thereby eliminating its discharge to surface water, the Discharger shall evaluate the technical, logistical and economic feasibility of conveying treated effluent to the Conaway Ranch for agricultural reuse consistent with Title 22 of the California Code of Regulations. Studies to determine the feasibility of reuse should include, but are not limited to, water balance analysis, nutrient and salt balance (agronomic rates for crop types to be grown), potential groundwater impact evaluations, evaluation of current groundwater background quality at the Conaway Ranch site, evaluation of treatment needs, evaluation of impacts to receiving water if discharge removed, and economic impacts to the City. The Discharger shall comply with the following time schedule in conducting the studies to determine the feasibility of reuse at

the Conaway Ranch. If the City fails to comply with the study requirements set forth below, this Order may be reopened and the compliance schedule for meeting final effluent limitations may be revised to eliminate the remaining time available to evaluate reuse.

Task	Compliance Date
1 Submit technical report: work plan and schedule for comprehensive evaluation	1 June 2009
2 Commence comprehensive evaluation	1 July 2009
3 Complete comprehensive evaluation	By 1 July 2010
4 Submit technical report: comprehensive evaluation results	1 September 2010
5. Submit City's Preferred Option for Compliance[5]	25 October 2010
6 Submit annual report describing the overall status of Reuse Feasibility	To be submitted in accordance with the MRP (Attachment E, Section IX.D.1.)

h. **Priority Pollutant Metals Study.** For a one-year period, **beginning no later than 31 January 2011**, the Discharger shall conduct monthly upstream receiving water monitoring for hardness-dependant priority pollutant metals (i.e., cadmium, chromium III, copper, lead, nickel, silver, and zinc), hardness, alkalinity, EC, pH, and TSS at RSW-001 and RSW-003. The Discharger shall submit a report summarizing the monitoring results **no later than 3 months** following the final monthly monitoring event. If there is no flow at RSW-001 or RSW-003 monitoring is not required and the report shall state that there was no flow.

[5] "Preferred Option for Compliance" means a written statement from the City Council, or its duly authorized representative, submitted to the Regional Water Board Executive Officer regarding the option the City intends to pursue for compliance with this Order. The City's identification of a "Preferred Option for Compliance" does not limit in any way the City's discretion with respect to complying with this Order and the California Environmental Quality Act, including but not limited to the discretion to (i) make such modifications deemed necessary and feasible to mitigate significant environmental impacts, (ii) select other feasible alternatives to avoid or substantially lessen such impacts, (iii) balance the benefits of the project against its significant unavoidable impacts prior to taking final action if such significant impacts cannot otherwise be substantially lessened or avoided, or (iv) determine not to proceed with the Preferred Option for Compliance.

3. Best Management Practices and Pollution Prevention

a. **Pollutant Minimization Program.** The Discharger shall develop and conduct a Pollutant Minimization Program (PMP) as further described below when there is evidence (e.g., sample results reported as DNQ when the effluent limitation is less than the MDL, sample results from analytical methods more sensitive than those methods required by this Order, presence of whole effluent toxicity, health advisories for fish consumption, results of benthic or aquatic organism tissue sampling) that a priority pollutant is present in the effluent above an effluent limitation and either: 1) A sample result is reported as DNQ and the effluent limitation is less than the RL; or 2) A sample result is reported as ND and the effluent limitation is less than the MDL, using definitions described in Attachment A and reporting protocols described in MRP Section IX.

The PMP shall include, but not be limited to, the following actions and submittals acceptable to the Regional Water Board:

i. An annual review and semi-annual monitoring of potential sources of the reportable priority pollutant(s), which may include fish tissue monitoring and other bio-uptake sampling;

ii. Quarterly monitoring for the reportable priority pollutant(s) in the influent to the wastewater treatment system;

iii. Submittal of a control strategy designed to proceed toward the goal of maintaining concentrations of the reportable priority pollutant(s) in the effluent at or below the effluent limitation;

iv. Implementation of appropriate cost-effective control measures for the reportable priority pollutant(s), consistent with the control strategy; and

v. An annual status report that shall be sent to the Regional Water Board including:

(1) All PMP monitoring results for the previous year;

(2) A list of potential sources of the reportable priority pollutant(s);

(3) A summary of all actions undertaken pursuant to the control strategy; and

(4) A description of actions to be taken in the following year.

b. **Pollution Prevention Plan for cyanide, selenium, aluminum, and iron.** The Discharger shall prepare and implement a pollution prevention plan for cyanide, selenium, aluminum, and iron in accordance with CWC section 13263.3(d)(3). The minimum requirements for the pollution prevention plan are outlined in the Fact Sheet, Attachment F, VII.B.3. A work plan and time schedule for preparation of the pollution prevention plan shall be completed and submitted **within 6 months of the effective date of this Order** for approval by the Executive Officer. The Pollution Prevention Plan shall be completed and submitted to the Regional Water Board **within two (2) years following work**

plan approval by the Executive Officer, and progress reports shall be submitted in accordance with the Monitoring and Reporting Program (Attachment E, Section IX.D.1.). The Pollution Prevention Plan required herein is not incorporated by reference into this Order.

c. **Salinity Evaluation and Minimization Plan.** The Discharger shall prepare and implement a salinity evaluation and minimization plan to address sources of salinity from the wastewater treatment system. The plan shall be completed and submitted to the Regional Water Board **within 9 months of the effective date of this Order** for approval by the Executive Officer.

d. **Salinity Reduction.** The Discharger shall provide annual reports demonstrating reasonable progress in the reduction of salinity in its discharge to the Willow Slough Bypass and Conaway Ranch Toe Drain. The annual reports shall be submitted in accordance with the Monitoring and Reporting Program (Attachment E, Section IX.D.1.).

e. **Dioxin Congeners Source Evaluation and Minimization Plan.** The Discharger shall prepare and implement a dioxin congeners evaluation and minimization plan to address sources of dioxin-like congeners detected in the WWTP influent and effluent. The plan shall be completed and submitted to the Regional Water Board **within one year of the effective date of this Order** for the approval by the Executive Officer.

4. Construction, Operation and Maintenance Specifications

a. **Treatment Pond Operating Requirements**

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

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

iii. Ponds shall be managed to prevent breeding of mosquitoes. In particular,

a) An erosion control program should assure that small coves and irregularities are not created around the perimeter of the water surface.
b) Weeds shall be minimized.
c) Dead algae, vegetation, and debris shall not accumulate on the water surface.

iv. Freeboard shall never be less than two feet (measured vertically to the lowest point of overflow.

v. Ponds shall have sufficient capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration during the non-irrigation season. Design seasonal precipitation shall be

based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.

5. Special Provisions for Municipal Facilities (POTWs Only)

a. Pretreatment Requirements

i. The Discharger shall implement its approved pretreatment program and the program shall be an enforceable condition of this Order. If the Discharger fails to perform the pretreatment functions, the Regional Water Board, the State Water Board or the U.S. Environmental Protection Agency (USEPA) may take enforcement actions against the Discharger as authorized by the CWA.

ii. The Discharger shall enforce the Pretreatment Standards promulgated under sections 307(b), 307(c), and 307(d) of the Clean Water Act. The Discharger shall perform the pretreatment functions required by 40 CFR Part 403 including, but not limited to:

a) Adopting the legal authority required by 40 CFR 403.8(f)(1);

b) Enforcing the Pretreatment Standards of 40 CFR 403.5 and 403.6;

c) Implementing procedures to ensure compliance as required by 40 CFR 403.8(f)(2); and

d) Providing funding and personnel for implementation and enforcement of the pretreatment program as required by 40 CFR 403.8(f)(3).

iii. The Discharger shall implement, as more completely set forth in 40 CFR 403.5, the necessary legal authorities, programs, and controls to ensure that the following incompatible wastes are not introduced to the treatment system, where incompatible wastes are:

a) Wastes which create a fire or explosion hazard in the treatment works;

b) Wastes which will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0, unless the works is specially designed to accommodate such wastes;

c) Solid or viscous wastes in amounts which cause obstruction to flow in sewers, or which cause other interference with proper operation or treatment works;

d) Any waste, including oxygen demanding pollutants (BOD, *etc.*), released in such volume or strength as to cause inhibition or disruption in the treatment works, and subsequent treatment process upset and loss of treatment efficiency;

e) Heat in amounts that inhibit or disrupt biological activity in the treatment works, or that raise influent temperatures above 40°C (104°F), unless the Regional Water Board approves alternate temperature limits;

f) Petroleum oil, non-biodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

g) Pollutants which result in the presence of toxic gases, vapors, or fumes within the treatment works in a quantity that may cause acute worker health and safety problems; and:

h) Any trucked or hauled pollutants, except at points predesignated by the Discharger.

iv. The Discharger shall implement, as more completely set forth in 40 CFR 403.5, the legal authorities, programs, and controls necessary to ensure that indirect discharges do not introduce pollutants into the sewerage system that, either alone or in conjunction with a discharge or discharges from other sources:

a) Flow through the system to the receiving water in quantities or concentrations that cause a violation of this Order, or:

b) Inhibit or disrupt treatment processes, treatment system operations, or sludge processes, use, or disposal and either cause a violation of this Order or prevent sludge use or disposal in accordance with this Order.

b. **Sludge/Biosolids Discharge Specifications**

i. Collected screenings, residual sludge, biosolids, harvested lemna vegetation, and other solids removed from liquid wastes shall be disposed of in a manner approved by the Executive Officer, and consistent with *Consolidated Regulations for Treatment, Storage, Processing, or Disposal of Solid Waste,* as set forth in Title 27, CCR, Division 2, Subdivision 1, section 20005, et seq. Removal for further treatment, disposal, or reuse at sites (e.g., landfill, composting sites, soil amendment sites) that are operated in accordance with valid waste discharge requirements issued by a regional water quality control board will satisfy these specifications.

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

iii. The treatment of sludge generated at the Facility shall be confined to the Facility property and conducted in a manner that precludes infiltration of waste constituents into soils in a mass or concentration that will violate Groundwater Limitations V.B. 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 V.B.

c. **Biosolids Disposal Requirements**

i. The Discharger shall comply with the Monitoring and Reporting Program for biosolids disposal contained in Attachment E.

ii. 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.

iii. 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.

d. **Biosolids Storage Requirements**

i. Facilities for the storage of Class B biosolids shall be located, designed and maintained to restrict public access to biosolids.

ii. Biosolids storage facilities shall be designed and maintained to prevent washout or inundation from a storm or flood with a return frequency of 100 years.

iii. Biosolids storage facilities, which contain biosolids, shall be designed and maintained to contain all storm water falling on the biosolids storage area during a rainfall year with a return frequency of 100 years.

iv. Biosolids storage facilities shall be designed, maintained and operated to minimize the generation of leachate.

e. **Collection System.** On 2 May 2006, the State Water Board adopted State Water Board Order 2006-0003, a Statewide General WDR for Sanitary Sewer Systems. The Discharger shall be subject to the requirements of Order 2006-0003 and any future revisions thereto. Order 2006-0003 requires that all public agencies that currently own or operate sanitary sewer systems apply for coverage under the General WDR. The Discharger has applied for and has been approved for coverage under State Water Board Order 2006-0003 for operation of its wastewater collection system.

Regardless of the coverage obtained under Order 2006-0003, the Discharger's collection system is part of the treatment system that is subject to this Order. As such, pursuant to federal regulations, the Discharger must properly operate and maintain its collection system [40 CFR section 122.41(e)], report any non-compliance [40 CFR section 122.41(l)(6) and (7)], and mitigate any discharge from the collection system in violation of this Order [40 CFR. section 122.41(d)].

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

6. Other Special Provisions

a. 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 Regional Water Board.

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

7. Compliance Schedules

a. **Title 22 Disinfection Requirements. By 25 October 2017,** wastewater discharged to the Willow Slough Bypass and Conaway Ranch Toe Drain shall be oxidized, coagulated, filtered, and adequately disinfected pursuant to the DPH reclamation criteria, Title 22 CCR, Division 4, Chapter 3, (Title 22) or equivalent. Until final compliance, the Discharger shall submit progress reports in accordance with the Monitoring and Reporting Program (Attachment E, Section IX.D.1.).

b. **Compliance Schedules for Final Effluent Limitations for BOD, TSS, turbidity, total coliform organisms, aluminum, ammonia, and iron**

i. **By 25 October 2017,** the Discharger shall comply with final effluent limitations for BOD, TSS, turbidity, total coliform organisms, aluminum, ammonia, and iron. On 25 July 2007, the Discharger submitted a compliance schedule justification for BOD, TSS, turbidity, total coliform organisms, aluminum, ammonia, and iron. As this compliance schedule is greater than one year, the Discharger shall submit annual progress reports in accordance with the Monitoring and Reporting Program (Attachment E, Section IX.D.1.)

ii. **Corrective Action Plan/Implementation Schedule.** The Discharger shall submit to the Regional Water Board a revised corrective action plan and implementation schedule including Reuse Feasibility Study measures to assure compliance with the final effluent limitations for BOD, TSS, turbidity, total coliform organisms, aluminum, ammonia, and iron by 1 August 2009.

iii. **Treatment Feasibility Study.** If the Discharger determines that wastewater reuse is not feasible (Section VI.C.2.e of this Order), the Discharger is required to perform an engineering treatment feasibility study examining the feasibility, costs and benefits of different treatment options that may be required to remove BOD, TSS, turbidity, total coliform organisms, aluminum, ammonia, and iron from the discharge. A work plan and time schedule for preparation of the treatment feasibility study shall be completed and submitted to the Regional Water Board **within 6 months of the effective date of this Order** for approval by the Executive Officer. The treatment feasibility study shall be completed and submitted to the Regional Water Board **by 25 October 2012**, and progress reports shall be submitted in accordance with the Monitoring and Reporting Program (Attachment E, Section IX.D.1.).

c. **Compliance Schedules for Final Effluent Limitations for cyanide, and selenium**

i. **By 18 May 2010,** the Discharger shall comply with the final effluent limitations for cyanide and selenium. The Discharger submitted a compliance schedule justification for cyanide on 22 January 2007 and a compliance schedule justification for selenium on 30 January 2007. The compliance schedule justification included all items specified in Paragraph 3, items (a) through (d), of section 2.1 of the SIP. As this compliance schedule is greater than one year, the Discharger shall submit annual progress reports in accordance with the Monitoring and Reporting Program (Attachment E, Section IX.D.1.)

ii. **Corrective Action Plan/Implementation Schedule.** The Discharger shall submit to the Regional Water Board a corrective action plan and implementation schedule to assure compliance with the final effluent limitations for cyanide and selenium by six months of the effective date of this Order.

iii. **Pollution Prevention Plan.** The Discharger shall prepare and implement a pollution prevention plan for cyanide and selenium, in accordance with CWC section 13263.3(d)(3). The minimum requirements for the pollution prevention plan are outlined in the Fact Sheet, Attachment F, VII.B.3. A work plan and time schedule for preparation of the pollution prevention plan shall be completed and submitted to the Regional Water Board **within 6 months of the effective date of this Order** for approval by the Executive Officer. The Pollution Prevention Plan shall be completed and submitted to the Regional Water Board **within two (2) years following work plan approval by the Executive Officer**, and progress reports shall be submitted in accordance with the Monitoring and Reporting Program (Attachment E,

Section IX.D.1.). The Pollution Prevention Plan required herein is not incorporated by reference into this Order.

iv. **Treatment Feasibility Study.** The Discharger is required to perform an engineering treatment feasibility study examining the feasibility, costs and benefits of different treatment options that may be required to remove cyanide and selenium from the discharge. A work plan and time schedule for preparation of the treatment feasibility study shall be completed and submitted to the Regional Water Board **within 6 months of the effective date of this Order** for approval by the Executive Officer. The treatment feasibility study shall be completed and submitted to the Regional Water Board **within two (2) years following work plan approval by the Executive Officer**, and progress reports shall be submitted in accordance with the Monitoring and Reporting Program (Attachment E, Section IX.D.1.).

VII. COMPLIANCE DETERMINATION

Compliance with the effluent limitations contained in section IV of this Order will be determined as specified below:

A. BOD and TSS Effluent Limitations. Compliance with the final effluent limitations for BOD and TSS shall be ascertained by 24-hour composite samples. Compliance with effluent limitations for percent removal shall be calculated using the arithmetic mean of 20°C BOD (5-day) and total suspended solids 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. Aluminum Effluent Limitations. Compliance with the effluent limitations for aluminum can be demonstrated using either total or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods, as supported by USEPA's Ambient Water Quality Criteria for Aluminum document (EPA 440/5-86-008), or other standard methods that exclude aluminum silicate particles as approved by the Executive Officer.

C. Total Mercury Mass Loading Effluent Limitations. The procedures for calculating mass loadings are as follows:

1. The total pollutant mass load for each individual calendar month shall be determined using an average of all effluent 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.
2. 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.

D. Average Dry Weather Discharge Flow Effluent Limitations. The Average Daily Discharge Flow represents the daily average flow when groundwater is at or near normal and runoff is not occurring. Compliance with the Average Dry Weather Discharge Flow effluent limitations will be determined annually based on the average daily flow over three consecutive dry weather months (e.g., July, August, and September).

E. Mass Effluent Limitations. Compliance with the mass effluent limitations will be determined during average dry-weather periods only when groundwater is at or near normal and runoff is not occurring.

F. Total Coliform Organisms Effluent Limitations. 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 seven days for which analyses have been completed. 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 for that parameter for that 1 day only within the reporting period.

G. Total Residual Chlorine Effluent Limitations. 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.

H. Chronic Whole Effluent Toxicity Effluent Limitation. Compliance with the accelerated monitoring and TRE/TIE provisions of Provision VI.C.2.a shall constitute compliance with effluent limitations IV.A.1.k and IV.A.2.k for chronic whole effluent toxicity.

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.

Best Practicable Treatment or Control (BPTC): BPTC is a requirement of State Water Resources Control Board Resolution 68-16 – "Statement of Policy with Respect to Maintaining High Quality of Waters in California" (referred to as the "Antidegradation Policy"). BPTC is the treatment or control of a 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."* Pollution is defined in CWC section 13050(l). In general, an exceedance of a water quality objective in the Basin Plan constitutes "pollution".

Bioaccumulative pollutants are 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.

Coefficient of Variation (*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) are those sample results less than the RL, but greater than or equal to the laboratory's MDL.

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

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

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 include~~d~~, 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 are 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) means 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 is 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) 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 title 40 of the Code of Federal Regulations, Part 136, Attachment B, revised as of 3 July 1999.

Minimum Level (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 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) are those sample results less than the laboratory's MDL.

Ocean Waters are 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 are substances for which degradation or decomposition in the environment is nonexistent or very slow.

Pollutant Minimization Program (PMP) means waste minimization and pollution prevention actions that include, but are not limited to, product substitution, waste stream recycling, alternative waste management methods, and education of the public and businesses. The goal of the PMP shall be to reduce all potential sources of a priority pollutant(s) through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, to maintain the effluent concentration at or below the water quality-based effluent limitation. Pollution prevention measures may be particularly appropriate for persistent

bioaccumulative priority pollutants where there is evidence that beneficial uses are being impacted. The Regional Water Board may consider cost effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Plan, if required pursuant to Water Code section 13263.3(d), shall be considered to fulfill the PMP requirements. The Pollution Prevention Plan required herein is not incorporated by reference into this Order.

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

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

Standard Deviation (σ) 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

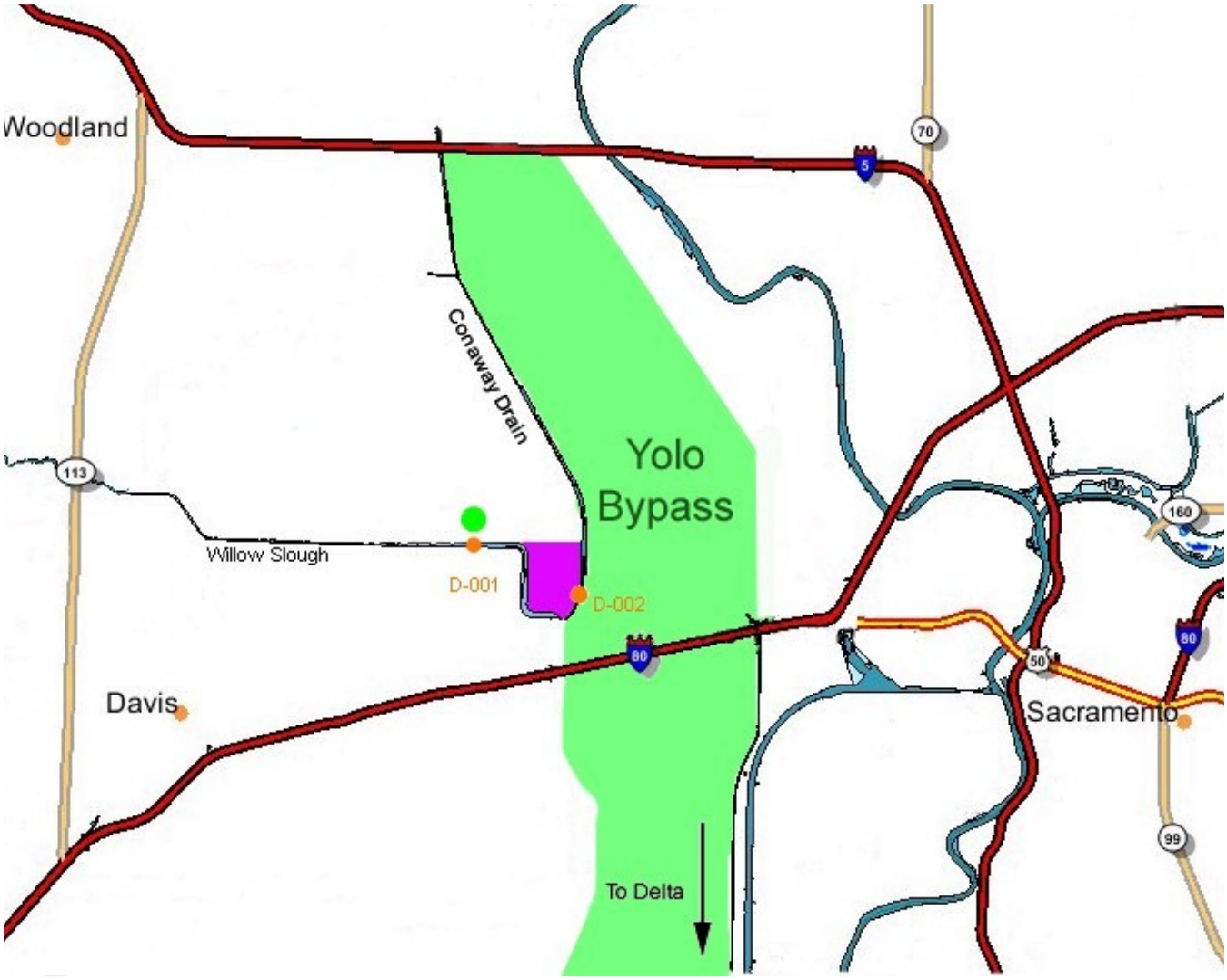
n is the number of samples.

Toxicity Reduction Evaluation (TRE) 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.)

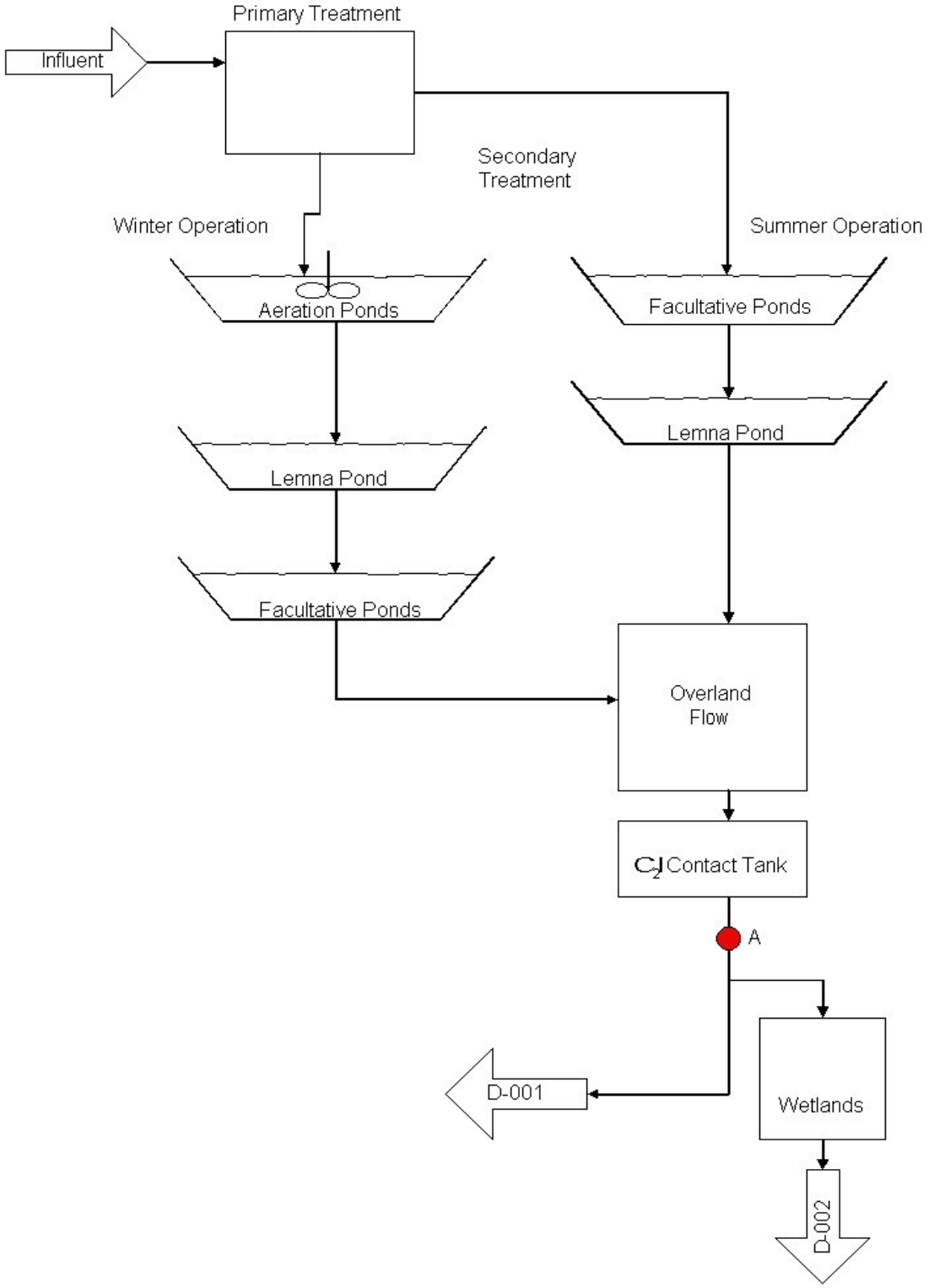
ATTACHMENT B1 – SITE MAP

Drawing Reference: **QUAD SHEET NAME** U.S.G.S TOPOGRAPHIC MAP 7.5 MINUTE QUADRANGLE *Photorevised 1973* *Not to scale*	SITE LOCATION MAP CITY OF DAVIS WASTEWATER TREATMENT PLANT YOLO COUNTY	N W E S

ATTACHMENT B2 – AREA MAP



ATTACHMENT C – FLOW SCHEMATIC



ATTACHMENT D –STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the 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 CFR § 122.41(a).)

2. The Discharger shall comply with effluent standards or prohibitions established under section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not yet been modified to incorporate the requirement. (40 CFR § 122.41(a)(1).)

B. Need to Halt or Reduce Activity Not a Defense

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

C. Duty to Mitigate

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

D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order. (40 CFR § 122.41(e).)

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges. (40 CFR § 122.41(g).)

2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations. (40 CFR § 122.5(c).)

F. Inspection and Entry

The Discharger shall allow the Regional Water Board, State Water Board, United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to (40 CFR § 122.41(i); 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 CFR § 122.41(i)(1));

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

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

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

G. Bypass

1. Definitions

   a. "Bypass" means the intentional diversion of waste streams from any portion of a treatment facility. (40 CFR § 122.41(m)(1)(i).)

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

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

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

   a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage (40 CFR § 122.41(m)(4)(i)(A));

   b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance (40 CFR § 122.41(m)(4)(i)(B)); and

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

4. The Regional Water Board may approve an anticipated bypass, after considering its adverse effects, if the Regional Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above. (40 CFR § 122.41(m)(4)(ii).)

5. Notice

   a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass. (40 CFR § 122.41(m)(3)(i).)

   b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below (24-hour notice). (40 CFR § 122.41(m)(3)(ii).)

H. Upset

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

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Standard Provisions – Permit Compliance I.H.2 below are met. No determination made during administrative review of claims that noncompliance was

caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. (40 CFR § 122.41(n)(2).).

2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that (40 CFR § 122.41(n)(3)):

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

   b. The permitted facility was, at the time, being properly operated (40 CFR § 122.41(n)(3)(ii));

   c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b below (24-hour notice) (40 CFR § 122.41(n)(3)(iii)); and

   d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above. (40 CFR § 122.41(n)(3)(iv))

3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof. (40 CFR § 122.41(n)(4))

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition. (40 CFR § 122.41(f).)

B. Duty to Reapply

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

C. Transfers

This Order is not transferable to any person except after notice to the Regional Water Board. The Regional Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the Water Code. (40 CFR § 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 CFR § 122.41(j)(1).)

B. Monitoring results must be conducted according to test procedures under Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 503 unless other test procedures have been specified in this Order. (40 CFR § 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 Part 503), the Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Regional Water Board Executive Officer at any time. (40 CFR § 122.41(j)(2).)

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements (40 CFR § 122.41(j)(3)(i));

2. The individual(s) who performed the sampling or measurements (40 CFR § 122.41(j)(3)(ii));

3. The date(s) analyses were performed (40 CFR § 122.41(j)(3)(iii));

4. The individual(s) who performed the analyses (40 CFR § 122.41(j)(3)(iv));

5. The analytical techniques or methods used (40 CFR § 122.41(j)(3)(v)); and

6. The results of such analyses. (40 CFR § 122.41(j)(3)(vi).)

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

1. The name and address of any permit applicant or Discharger (40 CFR § 122.7(b)(1)); and

2. Permit applications and attachments, permits and effluent data. (40 CFR § 122.7(b)(2).)

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

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

B. Signatory and Certification Requirements

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

2. All permit applications shall be signed by either a principal executive officer or ranking elected official. For purposes of this provision, a principal executive officer of a federal agency includes: (i) the chief executive officer of the agency, or (ii) a senior executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., Regional Administrators of USEPA). (40 CFR § 122.22(a)(3).).

3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in Standard Provisions – Reporting V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

   a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.2 above (40 CFR § 122.22(b)(1));

   b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.) (40 CFR § 122.22(b)(2)); and

   c. The written authorization is submitted to the Regional Water Board and State Water Board. (40 CFR § 122.22(b)(3).)

4. If an authorization under Standard Provisions – Reporting V.B.3 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.3 above must be submitted to the Regional Water Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 CFR § 122.22(c).)

5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above shall make the following certification:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." (40 CFR § 122.22(d).)

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment E) in this Order. (40 CFR § 122.22(l)(4).)

2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. (40 CFR § 122.41(l)(4)(i).)

3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional Water Board. (40 CFR § 122.41(l)(4)(ii).)

4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order. (40 CFR § 122.41(l)(4)(iii).)

D. Compliance Schedules

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

E. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. (40 CFR § 122.41(l)(6)(i).)

2. The following shall be included as information that must be reported within 24 hours under this paragraph (40 CFR § 122.41(l)(6)(ii)):

   a. Any unanticipated bypass that exceeds any effluent limitation in this Order. (40 CFR § 122.41(l)(6)(ii)(A).)

   b. Any upset that exceeds any effluent limitation in this Order. (40 CFR § 122.41(l)(6)(ii)(B).)

3. The Regional Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours. (40 CFR § 122.41(l)(6)(iii).)

F. Planned Changes

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

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in section 122.29(b) (40 CFR § 122.41(l)(1)(i)); or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are not subject to effluent limitations in this Order. (40 CFR § 122.41(l)(1)(ii).)

3. The alteration or addition results in a significant change in the Discharger's sludge use or disposal practices, and such alteration, addition, or change may justify the application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. (40 CFR§ 122.41(l)(1)(iii).)

G. Anticipated Noncompliance

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

H. Other Noncompliance

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

I. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Water Board, State Water Board, or USEPA, the Discharger shall promptly submit such facts or information. (40 CFR § 122.41(l)(8).)

VI. STANDARD PROVISIONS – ENFORCEMENT

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

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Publicly-Owned Treatment Works (POTWs)

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

1. Any new introduction of pollutants into the POTW from an indirect discharger that would be subject to sections 301 or 306 of the CWA if it were directly discharging those pollutants (40 CFR § 122.42(b)(1)); and

2. Any substantial change in the volume or character of pollutants being introduced into that POTW by a source introducing pollutants into the POTW at the time of adoption of the Order. (40 CFR § 122.42(b)(2).)

3. Adequate notice shall include information on the quality and quantity of effluent introduced into the POTW as well as any anticipated impact of the change on the quantity or quality of effluent to be discharged from the POTW. (40 CFR § 122.42(b)(3).)

ATTACHMENT E – MONITORING AND REPORTING PROGRAM

Table of Contents

List of Tables

ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations section 122.48 requires that all NPDES permits specify monitoring and reporting requirements. Water Code sections 13267 and 13383 also authorize the Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements, which implement the federal and state 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 this Regional Water Board.

B. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the State Department of Public Health. In the event a certified laboratory is not available to the Discharger, 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 must be kept in the laboratory and shall be available for inspection by Regional Water Board staff. The Quality Assurance-Quality Control Program must conform to USEPA guidelines or to procedures approved by the Regional Water Board.

C. All analyses shall be performed in a laboratory certified to perform such analyses by the California Department of Public Health. Laboratories that perform sample analyses shall be identified in all monitoring reports.

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 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.

II. MONITORING LOCATIONS

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

Table E-1. Monitoring Station Locations

Discharge Point Name	Monitoring Location Name	Monitoring Location Description
--	INF-001	Influent to the WWTP
001 & 002	EFF - A	Effluent after the disinfection process
001	EFF-001	Discharge 001 to Willow Slough Bypass
002	EFF-002	Discharge 002 to Conaway Ranch Toe Drain
	LND-001	Overland Flow System
001	RSW-001U	Willow Slough Bypass, 30 ft upstream of Discharge 001
001	RSW-001D	Willow Slough Bypass, 200 ft downstream of Discharge 001
002	RSW-002U	Conaway Ranch Toe Drain, 30 ft upstream of Discharge 002
002	RSW-002D	Conaway Ranch Toe Drain, 375 ft downstream of Discharge 002
	RGW-001	Groundwater Monitoring Well 1
	RGW -002	Groundwater Monitoring Well 2
	RGW -003	Groundwater Monitoring Well 3
	RGW -004	Groundwater Monitoring Well 4
	RGW -005	Groundwater Monitoring Well 5
	RGW -006	Groundwater Monitoring Well 6
	PND-001	Oxidation Pond 1
	PND-002	Oxidation Pond 2
	PND-003	Oxidation Pond 3
	PND-004	Aeration Pond 1
	PND-005	Aeration Pond 2
	PND-006	Lemna Pond
	WTL-001	Wetlands Influent
	WTL-002	Wetlands WW Tract
	WTL-003	Wetlands Tract 6
	WTL-004	Wetlands Tract 7
	WTL-005	Wetlands Effluent
	SED-001	Wetlands Sediment
	SPL-001	Water Supply
	BIO-001	Sludge Lagoons

III. INFLUENT MONITORING REQUIREMENTS

A. Monitoring Location INF-001

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

Table E-2. Influent Monitoring

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Flow	mgd	Meter	Continuous	
BOD 5-day 20°C	mg/L, lbs/day	24-hr Composite[1]	3/week	
Total Suspended Solids	mg/L, lbs/day	24-hr Composite[1]	3/week	
Electrical Conductivity	umhos/cm	Grab	1/year	
pH	pH units	Grab	1/day	

1. 24-hour flow proportional composite.

IV. EFFLUENT MONITORING REQUIREMENTS

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed ~~above~~ below, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

A. Monitoring Location EFF-A

The Discharger shall monitor effluent at EFF-A as follows, when discharging to Discharge Point 001 and/or Discharge Point 002. 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 and (Minimum Level, units), respectively
BOD 5-day 20°C[1]	mg/L, lbs/day	24-hr Composite[2]	3/week	
Total Suspended Solids[1]	mg/L, lbs/day	24-hr Composite[2]	3/week	
Total Coliform Organisms[3]	MPN/100 mL	Grab[4]	5/week	
Settleable Solids[1]	mL/L	Grab[4, 5]/24-hr Composite[2]	3/week	
Turbidity[6, 1]	NTU	Meter	Continuous	
Total Residual Chlorine[7]	mg/L	Meter	Continuous	
Electrical Conductivity @ 25°C[1]	µmhos/cm	Grab[4]	5/week	

1. Prior to completion of the upgraded tertiary WWTP, BOD, TSS, settleable solids, turbidity, and electrical conductivity may be monitored at EFF-001 and EFF-002 in lieu of at EFF-A.
2. 24-hour flow proportioned composite.
3. Samples shall be collected downstream of the last chlorine addition, before de-chlorination.
4. Grab samples shall not be collected at the same time each day.
5. Grab samples are required in lieu of composite samples due to the equalizing nature of the existing land based treatment system. Composite samples are required when the treatment system is upgraded to a continuous flow system.
6. Turbidity shall be monitored beginning on the effective date of the final turbidity effluent limitation in this Order or when filtration is added to the treatment process, whichever is sooner. If filtration has not yet been added, then the monitoring reports shall so state. Turbidity results shall be reported as described in IX.B.
7. Total chlorine residual must be monitored with a method sensitive to and accurate at the permitted level of 0.01 mg/L. Samples shall be collected downstream of last chlorine addition, after de-chlorination. Results shall be reported as described in IX.B.

B. Monitoring Location EFF-001

1. The Discharger shall monitor effluent at EFF-001 as follows, when discharging to Discharge Point 001. 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-4. Effluent Monitoring Discharge 001

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method and (Minimum Level, units), respectively
Flow	Mgd	Meter	Continuous	
Temperature	°C (F)	Grab[1]	1/week	
pH	Standard units	Meter	Continuous	
Dissolved Oxygen	mg/L	Grab[1]	1/week	
Total Ammonia (as N) [2, 3]	mg/L, lbs/day	Grab[1]	5/week	
Total Dissolved Solids	mg/L	Grab[1]	1/month	
Aluminum, Total Recoverable[4]	ug/L	Grab[1]	1/month	
Boron	ug/L	Grab[1]	1/month	
Chloride, Total Recoverable	mg/L	Grab[1]	1/month	
Cyanide, Total Recoverable	ug/L	Grab[1]	1/month	
TCDD Equivalents[5]	pg/L	Grab[1]	Quarterly/ Annually[6]	
Hardness (as $CaCO_3$)[7]	mg/L	Grab[1]	Monthly	
Iron, Total Recoverable	mg/L	Grab[1]	1/month	
Mercury, Total Recoverable	ug/L	Grab[1]	1/month	
Oil and grease	mg/L	Grab[1]	Quarterly	
Selenium, Total Recoverable	ug/L, lbs/day	Grab[1]	1/month	
Sodium, Total Recoverable	mg/L	Grab[1]	1/month	
Standard Minerals[8]	mg/L	Grab[1]	1/year	
Priority Pollutants [9, 10, 11, 12]	ug/L	As Appropriate[1, 13]	1/year	

1. Grab samples shall not be collected at the same time each day
2. Concurrent with biotoxicity monitoring.
3. Temperature and pH data shall be collected on the same date and at the same time as the ammonia sample.
4. Compliance with the effluent limitations for aluminum can be demonstrated using either total or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods, as supported by USEPA's Ambient Water Quality Criteria for Aluminum document (EPA 440/5-86-008), or other standard methods that exclude aluminum silicate particles as approved by the Executive Officer.
5. TCDD Equivalents include the 17 congeners identified as TCDD Equivalents in the SIP.
6. Quarterly for eight consecutive quarters following the effective date of this Order, then annually throughout the remainder of the effectiveness of this Order.
7. Hardness samples to be taken concurrently with metals samples.
8. Standard minerals shall include the following: boron, calcium, iron, magnesium, potassium, sodium, chloride, manganese, phosphorus, total alkalinity (including alkalinity series), and hardness, and include verification that the analysis is complete (i.e., cation/anion balance).
9. Priority Pollutants is defined as USEPA Priority Pollutants and consists of the constituents listed in the most recent National Toxics Rule and California Toxics Rule.
10. For priority pollutant constituents with effluent limitations, detection limits shall be below the effluent limitations. If the lowest minimum level (ML) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Plan or SIP) is not below the effluent limitation, the detection limit shall be the lowest ML. For priority pollutant constituents without effluent limitations, the detection limits shall be equal to or less than the lowest ML published in Appendix 4 of the SIP.
11. Concurrent with receiving surface water sampling and effluent hardness, pH, and temperature sampling.
12. All peaks are to be reported, along with any explanation provided by the laboratory.
13. Volatile samples and phthalate esters shall be grab samples, the remainder shall be 24-hour composite samples.

C. Monitoring Location EFF-002

1. The Discharger shall monitor effluent at EFF-002 as follows, when discharging from Discharge Point 002. 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-5. Effluent Monitoring Discharge 002

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method and (Minimum Level, units), respectively
Flow	mgd	Meter	Continuous	
Temperature	°C (F)	Grab[1]	1/week	
pH	Standard units	Meter	Continuous	
Dissolved Oxygen	mg/L	Grab[1]	1/week	
Total Ammonia (as N) [2,3]	mg/L, lbs/day	Grab[1]	5Xs/week	
Total Dissolved Solids	mg/L	Grab[1]	1/month	
Aluminum, Total Recoverable[4]	ug/L	Grab[1]	1/month	

Boron	ug/L	Grab[1]	1/month	
Chloride, Total Recoverable	ug/L	Grab[1]	1/month	
Copper, Total Recoverable	ug/L	Grab[1]	1/month	
TCDD Equivalents [5]	pg/L	Grab[1]	Quarterly/ Annually [6]	
Hardness (as $CaCO_3$) [7]	mg/L	Grab[1]	Monthly	
Iron, Total Recoverable	mg/L	Grab[1]	1/month	
Mercury, Total Recoverable	ug/L	Grab[1]	1/month	
Oil and grease	mg/L	Grab[1]	Quarterly	
Selenium, Total Recoverable	ug/L, lbs/day	Grab[1]	1/month	
Sodium, Total Recoverable	mg/L	Grab[1]	1/month	
Standard Minerals [8]	mg/L	Grab[1]	1/year	
Priority Pollutants [9, 10, 11, 12]	µg/L	As Appropriate[1, 13]	1/year	

1. Grab samples shall not be collected at the same time each day.
2. Concurrent with biotoxicity monitoring.
3. Temperature and pH data shall be collected on the same date and at the same time as the ammonia sample.
4. Compliance with the effluent limitations for aluminum can be demonstrated using either total or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods, as supported by USEPA's Ambient Water Quality Criteria for Aluminum document (EPA 440/5-86-008), or other standard methods that exclude aluminum silicate particles as approved by the Executive Officer.
5. TCDD Equivalents include the 17 congeners identified as TCDD Equivalents in the SIP.
6. Quarterly for eight consecutive quarters following the effective date of this Order, then annually throughout the remainder of the effectiveness of this Order.
7. Hardness samples to be taken concurrently with metals samples.
8. Standard minerals shall include the following: boron, calcium, iron, magnesium, potassium, sodium, chloride, manganese, phosphorus, total alkalinity (including alkalinity series), and hardness, and include verification that the analysis is complete (i.e., cation/anion balance).
9. Priority Pollutants is defined as USEPA Priority Pollutants and consists of the constituents listed in the most recent National Toxics Rule and California Toxics Rule.
10. For priority pollutant constituents with effluent limitations, detection limits shall be below the effluent limitations. If the lowest minimum level (ML) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Plan or SIP) is not below the effluent limitation, the detection limit shall be the lowest ML. For priority pollutant constituents without effluent limitations, the detection limits shall be equal to or less than the lowest ML published in Appendix 4 of the SIP.
11. Concurrent with receiving surface water sampling and effluent hardness, pH, and temperature sampling.
12. All peaks are to be reported, along with any explanation provided by the laboratory.
13. Volatile samples and phthalate esters shall be grab samples, the remainder shall be 24-hour composite samples.

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

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

1. *Monitoring Frequency* – the Discharger shall perform monthly acute toxicity testing, concurrent with effluent ammonia sampling.

2. *Sample Types* – For static non-renewal and static renewal testing, the samples shall be grab samples and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent monitoring locations EFF-001 and EFF-002.

3. *Test Species* – Test species shall be larval stage (15 to 30 days old) rainbow trout (*Oncorhchus 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.

6. *Ammonia Toxicity* – The acute toxicity testing may be modified to eliminate ammonia-related toxicity until **25 October 2017**, at which time the Discharger shall be required to implement the test without modifications to eliminate ammonia toxicity.

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 grab samples. The effluent samples shall be taken at the effluent monitoring location specified in the Monitoring and Reporting Program. The receiving water control shall be a grab sample obtained from the RSW-001U sampling location when discharging through Discharge 001 and RSW-002U when discharging through Discharge 002, as identified in the Monitoring and Reporting Program.

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

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

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

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

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

7. *Dilutions* – The chronic toxicity testing shall be performed using the dilution series identified in Table E-6, below. The receiving water control shall be used as the diluent (unless the receiving water is toxic). If the receiving water is toxic, laboratory control water may be used as the diluent, in which case, the receiving water should still be sampled and tested to provide evidence of its toxicity.

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.

9. *Ammonia Toxicity* – The chronic toxicity testing may be modified to eliminate ammonia-related toxicity until 25 October 2017, at which time the Discharger shall be required to implement the test without modifications to eliminate ammonia toxicity.

Table E-6. Chronic Toxicity Testing Dilution Series

Sample	Dilutions (%)					Controls	
	100	75[1]	50[1]	25[1]	12.5[1]	Receiving Water	Laboratory Water
% Effluent	100	75	50	25	12.5	0	0
% Receiving Water	0	25	50	75	87.5	100	0
% Laboratory Water	0	0	0	0	0	0	100

~~a.~~1. These dilutions are only required during accelerated sampling, not during routine sampling.

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

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

1. **Chronic WET Reporting.** Regular chronic toxicity monitoring results shall be reported to the Regional Water Board within 30 days following completion of the test, and shall contain, at minimum:
   a. The results expressed in TUc, measured as 100/NOEC, and also measured as $100/LC_{50}$, $100/EC_{25}$, $100/IC_{25}$, and $100/IC_{50}$, 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 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 Toxicity Reduction Evaluations shall be submitted in accordance with the schedule contained in the Discharger's approved TRE Work Plan.

4. **Quality Assurance (QA).** The Discharger must provide the following information for QA purposes (If applicable):

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. RECLAMATION MONITORING REQUIREMENTS – NOT APPLICABLE

VII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER AND GROUNDWATER

A. Monitoring Location RSW-001U, RSW-001D, RSW-002U and RSW-002D

1. The Discharger shall monitor the Willow Slough Bypass at RSW-001U and RSW-001D and the Conaway Ranch Toe Drain at RSW-002U and RSW-002D as follows:

Table E-7. Receiving Water Monitoring Requirements – Surface Water

Parameter	Units	Sample Type	Minimum Sampling Frequency[1]	Required Analytical Test Method
Dissolved Oxygen	mg/L	Grab	1/week	
pH[2]	Standard Units	Grab	1/week	
Temperature[2]	°F (°C)	Grab	1/week	
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/week	
Fecal Coliform Organisms	MPN/100 mL	Grab	1/month	
Hardness	mg/L	Grab	Quarterly	
Turbidity	NTU	Grab	1/month	
~~Radionulcides~~	~~PCi/L~~	~~Grab~~	~~1/year~~	

1. At specified frequency or when discharged.
2. pH and temperature shall be determined at the time of sample collection for ammonia.

2. In conducting the receiving water sampling, a separate log shall be kept of the receiving water conditions. Attention shall be given to the presence or absence of:

a. Floating or suspended matter	e. Visible films, sheens, or coatings
b. Discoloration	f. Fungi, slimes, or objectionable growths
c. Bottom deposits	g. Potential nuisance conditions
d. Aquatic life	h. Flow Direction
	i. Upstream Conditions

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

B. Monitoring Location RGW-001, RGW -002, RGW -003, RGW -004, RGW -005, and RGW –006

1. The Discharger shall monitor the groundwater at RGW-001, RGW-002, RGW-003, RGW-004, RGW-005, and RGW-006 as follows:

Table E-8. Receiving Water Monitoring Requirements – Groundwater

Parameter[1]	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Depth to Groundwater	feet	Grab	1/month	
Groundwater Elevation	feet	Grab	1/month	
Nitrate (as N)	mg/L	Grab	Quarterly	
Nitrite (as N)	mg/L	Grab	Quarterly	
Heavy Metals (Title 22)	mg/L	Grab	1/year	
Total Trihalomethanes[2]	ug/L	Grab	1/year	
Dissolved Oxygen	mg/L	Grab	1/month	
pH	Standard Units	Grab	1/month	
Temperature	°F (°C)	Grab	1/month	
Total Dissolved Solids	mg/L	Grab	1/month	
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/month	
Total Coliform Organisms	MPN/ 100 mL	Grab	1/month	
Fecal Coliform Organisms	MPN/ 100 mL	Grab	1/month	
Ammonia (as N)	mg/L	Grab	1/month	
Nitrate + Nitrite (as N)	mg/L	Calculated	Quarterly	

1. Prior to sampling, the groundwater monitoring wells shall be pumped until the temperature, specific conductivity, and pH have stabilized to ensure representative samples.
2. Total Trihalomethanes include bromoform, chloroform, dibromochloromethane, and bromodichloromethane.

2. Groundwater monitoring results for the constituents above shall be submitted monthly and include a site map showing the location of the wells and the direction and gradient of groundwater flow.

3. A groundwater report shall be submitted as part of the Report of Waste Discharge for the renewal of this Order. The report must contain a brief written description of any groundwater investigation and sampling work completed during the term of this Order, a site map showing the location of all monitoring wells, and tables showing all groundwater monitoring data collected since the wells were installed, including groundwater depth and elevation data, pH, EC, and all other monitored constituents.

VIII. OTHER MONITORING REQUIREMENTS

A. Pond monitoring

1. The Discharger shall monitor the ponds at monitoring locations PND 001, PND 002, PND 003, PND 004, PND 005, and PND 006 as follows:

Table E-9. Pond Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Freeboard	feet	Grab	1/day	
pH	pH Units	Grab	1/week	
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/week	
Nitrate (as N)	mg/L	Grab	1/month	
Nitrite (as N)	mg/L	Grab	1/month	
TKN (as N)	mg/L	Grab	1/month	
Ammonia (as N)	mg/L	Grab	1/month	
Odors	Observation	--	1/week	
Levee Condition	Observation	--	1/week	
Dissolved Oxygen	mg/L	Grab	1/month	

B. Wetlands Monitoring

1. The Discharger shall monitor the wetlands at monitoring locations WTL-001 and WTL-005 as follows:

Table E-10. Wetlands Monitoring Requirements – Influent and Effluent

Parameter	Units	Sample Type	Minimum Sampling Frequency[3, 4]	Required Analytical Test Method
Selenium	ug/L	Grab	1/month	
Chronic Toxicity	--	Grab	Quarterly	
Metals[1]	ug/L	Grab	Quarterly	
Ammonia[2] (as N)	mg/L	Grab	1/month	
pH	pH units	Grab	1/month	
Specific Conductivity	umhos/cm	Grab	1/month	
Nitrate (as N)	mg/L	Grab	1/month	
Nitrite (as N)	mg/L	Grab	1/month	
TKN (as N)	mg/L	Grab	1/month	
Temperature	°F (°C)	Grab	1/month	
Hardness	mg/L	Grab	Quarterly	

1. Metal sampling shall include aluminum, antimony, arsenic, cadmium, chromium III, chromium VI, copper, lead, mercury, nickel, silver, and zinc.
2. pH and temperature shall be determined at the time of sample collection for ammonia.
3. Influent sampling may be sampled immediately after dechlorination.
4. If not discharging effluent from the wetlands, no effluent wetlands monitoring is required. If not discharging to the wetlands, influent wetlands monitoring is not required.

2. The Discharger shall monitor the wetlands at monitoring locations WTL-002, WTL-003, and WTL-004 as follows:

Table E-11. Wetlands Monitoring Requirements - Tracts

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Selenium	ug/L	Grab	1/month	
Metals[1]	ug/L	Grab	Quarterly	
pH	pH units	Grab	1/month	
Specific Conductivity	umhos/cm	Grab	1/month	
Temperature	°F (°C)	Grab	1/month	
Hardness	mg/L	Grab	Quarterly	
Dissolved Oxygen	mg/L	Grab	1/month	

1. Metal sampling shall include aluminum, antimony, arsenic, cadmium, chromium III, chromium VI, copper, lead, mercury, nickel, silver, and zinc.

3. A wetlands food chain monitoring program shall continue to evaluate the selenium concentration in two aquatic invertebrate species, *Corixid sp.* and *Notonecta sp*. Samples shall be collected and analyzed during February through June. Samples shall be collected from the wastewater and stormwater tracts every year during February through June. The odd numbered tracts shall be sampled in odd numbered years and the even numbered tracts shall be sampled in even number years.

4. Composite sediment samples shall be taken during the water bird nesting season (February through June) from the upper 2 – 3 inches of wetlands sediments at the same locations as the food chain samples. The Discharger shall monitor sediment at monitoring locations SED-001 as follows:

Table E-12. Wetlands Sediment Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Selenium	mg/kg	Grab	1/year	
Nitrate (as N)	mg/kg	Grab	1/year	
Nitrite (as N)	mg/kg	Grab	1/year	
Metals[1]	mg/kg	Grab	1/year	

1. Metal sampling shall include aluminum, antimony, arsenic, cadmium, chromium III, chromium VI, copper, lead, mercury, nickel, silver, and zinc.

5. Wildlife monitoring shall consist of a wildlife census and avian egg monitoring. The census shall be conducted on an established transect that is representative of the wetlands. The survey's focus shall be on aquatic birds, but incidental observations of other wildlife species shall also be recorded. The census shall be conducted every other month throughout the year. Avian eggs shall be collected and evaluated for selenium content annually from February through June. The program shall monitor at least one shorebird and one waterfowl species. A minimum of ten eggs per species will be collected using not more than one egg per sample nest except

when there are less than ten nests. If there are less than ten nests for some species, then one egg per nest must be collected. Egg sampling shall take place in representative locations thought the wetlands. The Discharger shall report the geometric mean selenium concentration in avian eggs in µg/g (dry weight basis).

C. 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-13. Municipal Water Supply Monitoring Requirements

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

1. If the water supply is from more than one source, the EC 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).

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

3. **Compliance Time Schedules.** For compliance time schedules included in the Order, the Discharger shall submit to the Regional Water Board, on or before each compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Water Board by letter when it returns to compliance with the compliance time schedule.

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

5. **Reporting Protocols.** The Discharger shall report with each sample result the applicable Reporting Level (RL) and the current Method Detection Limit (MDL), as determined by the procedure in Part 136.

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

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

   b. Sample results less than the RL, but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

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

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

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

6. **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.

B. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, the Discharger shall submit hard copy SMRs. The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

2. Monitoring results shall be submitted to the Regional Water Board by the **first day** of the second month following sample collection. Quarterly, semiannual and annual monitoring results shall be submitted by the **first day of the second month following each calendar quarter, semi-annual period, and year**, respectively.

3. In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements (e.g., effluent limitations and discharge specifications, receiving water limitations, special provisions, etc.). The highest daily maximum for the month, monthly and weekly averages, and medians, and removal efficiencies (%) for BOD and Total Suspended Solids, shall be determined and recorded as needed to demonstrate compliance. In addition, the following shall be calculated and reported in the SMRs:

   a. **Annual Average Limitations.** For constituents with effluent limitations specified as "calendar annual average", the Discharger shall report the calendar annual average in the December SMR. The calendar annual average shall be calculated as the average of the monthly averages for the calendar year.

   b. **Mass Loading Limitations.** For BOD_5, TSS, and ammonia, the Discharger shall calculate and report the mass loading (lbs/day) in the SMRs. The mass loading shall be calculated as follows:

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

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

   c. **Mercury.** The Discharger shall calculate and report effluent total annual mass loading of total mercury in the December SMR. The total annual mass loading

shall be calculated as specified in Section VII.C. of the Limitations and Discharger Specifications.

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

e. **Average Dry Weather Flow.** The Discharger shall calculate and report the average dry weather flow for the Facility discharge in the December SMR. The average dry weather flow shall be calculated annually as specified in Section VII.D. of the Limitations and Discharge Specifications.

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.F. of the Limitations and Discharge Specifications.

g. **Dissolved Oxygen, Temperature, and Turbidity Receiving Water Limitations.** The Discharger shall state whether results complied with limitations.

h. **Wetlands and Wetlands Sediment Monitoring.** The Discharger shall submit wetlands and wetlands sediment monitoring results and requirements with the annual reports.

4. 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.

5. If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

6. A letter transmitting the self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions.

7. SMRs must be submitted to the Regional Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

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

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

Table E-14. 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	**Sunday following permit effective date or on permit effective date if on a Sunday**	**Sunday through Saturday**	**Submit with monthly SMR**
3/week	**Sunday following permit effective date or on permit effective date if on a Sunday**	**Sunday through Saturday**	**Submit with monthly SMR**
1/month	**First day of calendar month following permit effective date or on permit effective date if that date is first day of the month**	**1st day of calendar month through last day of calendar month**	**Submit with monthly SMR**
Quarterly	**Closest of 1 January, 1 April, 1 July, or 1 October following (or on) permit effective date**	**1 January through 31 March 1 April through 30 June 1 July through 30 September 1 October through 31 December**	**~~Submit with quarterly SMR~~1st day of second month after end of the monitoring period**
3/year	**Closest of 1 January, 1 May, or 1 September following (or on) permit effective date**	**1 January through 30 April 1 May through 31 August 1 September through 31 December**	**30 days from the end of the monitoring period**
2/year	**Closest of 1 January or 1 July following (or on) permit effective date**	**1 January through 30 June 1 July through 31 December**	**30 days from the end of the monitoring period**
1/year	**1 January following (or on) permit effective date**	**1 January through 31 December**	**1st day of second month after end of the monitoring period~~30 days from the end of the monitoring period~~**

C. Discharge Monitoring Reports (DMRs)

1. As described in Section IX.B.1 above, at any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit SMRs that will satisfy federal requirements for submittal of Discharge Monitoring Reports (DMRs). Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.

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

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

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

D. Other Reports

1. **Progress Reports.** As specified in the compliance time schedules required in Special Provisions VI, progress reports shall be submitted in accordance with the following reporting requirements. At a 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-15. Reporting Requirements for Special Provisions Progress Reports

Special Provision	Reporting Requirements
Pollution Prevention Plan for cyanide and selenium	**1 December**, annually, after approval of work plan until final compliance
Pollution Prevention Plan for aluminum and iron	**1 December**, annually, after approval of work plan until final compliance
Salinity Reduction Annual Reports	**1 December**, annually
Title 22 Disinfection Requirements	**1 December**, annually, until final compliance

Special Provision	Reporting Requirements
BPTC Evaluation Tasks	**1 February**, annually**,** following completion of Task 4 of BPTC Evaluation Compliance Schedule
Reuse Feasibility Study	**1 June**, annually, after submittal of work plan until final compliance if reuse is feasible.
Compliance Schedules for Final Effluent Limitations for cyanide and selenium compliance with final effluent limitations	**1 June**, annually, until final compliance
Compliance Schedules for Final Effluent Limitations for BOD, TSS, turbidity, total coliform organisms, aluminum, ammonia, and iron, compliance with final effluent limitations	**1 June**, annually, after completion of the reuse feasibility study if the Discharger determines that reuse if not feasible until final compliance
Compliance Schedules for Final Effluent Limitations for cyanide, and selenium. (Treatment Feasibility Study)	**1 June**, annually, after approval of work plan until final compliance
Compliance Schedules for Final Effluent Limitations for BOD, TSS, turbidity, total coliform organisms, aluminum, ammonia, and iron. (Treatment Feasibility Study)	**1 June**, annually, after completion of the reuse feasibility study if the Discharger determines that reuse if not feasible until final compliance

2. Within **60 days** of permit adoption, the Discharger shall submit a report outlining minimum levels, method detection limits, and analytical methods for approval, with a goal to achieve detection levels below applicable water quality criteria. At a minimum, the Discharger shall comply with the monitoring requirements for CTR constituents as outlined in section 2.3 and 2.4 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*, adopted 2 March 2000 by the State Water Resources Control Board. All peaks identified by analytical methods shall be reported.

3. The Discharger's sanitary sewer system collects wastewater using sewers, pipes, pumps, and/or other conveyance systems and directs the raw sewage to the wastewater treatment plant. A "sanitary sewer overflow" is defined as a discharge to ground or surface water from the sanitary sewer system at any point upstream of the wastewater treatment plant. Sanitary sewer overflows are prohibited by this Order. All violations must be reported as required in Standard Provisions. Facilities (such as wet wells, regulated impoundments, tanks, highlines, *etc*.) may be part of a sanitary sewer system and discharges to these facilities are not considered sanitary sewer overflows, provided that the waste is fully contained within these temporary storage facilities.

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

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

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

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

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

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

5. **Annual Pretreatment Reporting Requirements.** The Discharger shall submit annually a report to the Regional Water Board, with copies to USEPA Region 9 and the State Water Board, describing the Discharger's pretreatment activities over the previous 12 months. 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 EPA has identified under section 307(a) of the CWA which are known or suspected to be discharged by industrial users.

      Sludge 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. 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 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 industrial 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 industrial 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 industrial users that the Discharger has notified regarding Baseline Monitoring Reports and the cumulative number of industrial user responses.

d. An updated list of the Discharger's industrial users including their names and addresses, or a list of deletions and additions keyed to a previously submitted list. The Discharger shall provide a brief explanation for each deletion. The list shall identify the industrial users subject to federal categorical standards by specifying which set(s) of standards are applicable. The list shall indicate which categorical industries, or specific pollutants from each industry, are subject to local limitations that are more stringent than the federal categorical standards. The Discharger shall also list the noncategorical industrial users that are subject only to local discharge limitations. The Discharger shall characterize the compliance status through the year of record of each industrial user 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.

   A report describing the compliance status of each industrial user characterized by the descriptions in items iii. through vii. above shall be submitted for each calendar quarter **within 21 days of the end of the quarter**. The report shall identify the specific compliance status of each such industrial user 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. This quarterly reporting requirement shall commence upon issuance of this Order.

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

   i. the names and addresses of the industrial users 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.

f. A summary of the compliance and enforcement activities during the past year. The summary shall include the names and addresses of the industrial users affected by the following actions:

   i. Warning letters or notices of violation regarding the industrial users' apparent noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the apparent violation concerned the federal categorical standards or local discharge limitations.
   ii. Administrative orders regarding the industrial users noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.
   iii. Civil actions regarding the industrial users' noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.
   iv. Criminal actions regarding the industrial users noncompliance with federal categorical standards or local discharge limitations. For each industrial user, identify whether the violation concerned the federal categorical standards or local discharge limitations.
   v. Assessment of monetary penalties. For each industrial user identify the amount of the penalties.
   vi. Restriction of flow to the POTW.
   vii. Disconnection from discharge to the POTW.

g. A description of any significant changes in operating the pretreatment program which differ from the information in the Discharger's approved Pretreatment Program including, but not limited to, changes concerning: the program's administrative structure, local industrial discharge limitations, monitoring program

or monitoring frequencies, legal authority or enforcement policy, funding mechanisms, resource requirements, or staffing levels.

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

Duplicate signed copies of these Pretreatment Program reports shall be submitted to the Regional Water Board and the:

State Water Resources Control Board
Division of Water Quality
P.O. Box 944213
Sacramento, CA 94244-2130

and the

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

ATTACHMENT F – FACT SHEET

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ATTACHMENT F – FACT SHEET

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

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

I. PERMIT INFORMATION

The following table summarizes administrative information related to the facility.

Table F-1. Facility Information

WDID	5A570100001
Discharger	City of Davis
Name of Facility	Wastewater Treatment Plant
Facility Address	45400 County Road 28H Davis, CA, 95616 Yolo County
Facility Contact, Title and Phone	Keith Smith, Utilities Engineer, (530) 757-5676
Authorized Person to Sign and Submit Reports	Keith Smith, Utilities Engineer, (530) 757-5676 ~~Jim Beatty, WWTP Supervisor (530) 756-1238~~
Mailing Address	23 Russell Blvd., Davis, CA 95616
Billing Address	23 Russell Blvd., Davis, CA 95616
Type of Facility	POTW (Standard Industrial Classification: 4952)
Major or Minor Facility	Major
Threat to Water Quality	--
Complexity	--
Pretreatment Program	Y
Reclamation Requirements	NA
Facility Permitted Flow	7.5 million gallons per day (average dry weather flow)
Facility Design Flow	7.5 million gallons per day (average dry weather flow)
Watershed	Sacramento River Watershed
Receiving Water	Willow Slough Bypass and Conaway Ranch Toe Drain
Receiving Water Type	inland surface water

A. The City of Davis (hereinafter Discharger) is the owner and operator of the City of Davis wastewater treatment plant (hereinafter WWTP or Facility).

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

B. The Regional Water Board adopted Order No. R5-2007-0132 on 25 October 2007. The permit was subsequently petitioned by the California Sportfishing Protection Alliance, and on 18 November 2008, the State Water Board adopted Order WQ 2008-0008 remanding the permit to the Regional Water Board for modification. The State Water Board remand required the Regional Water Board address items related to chronic whole effluent toxicity, the hardness for calculating CTR hardness-dependent aquatic life criteria for CTR metals to protect from acute toxicity impacts, the re-evaluation of the reasonable potential analysis for copper, lead, nickel, silver, and zinc due to possible changes in hardness, and to allow the use of the City of Woodland's EC site-specific study or other studies for determination of an appropriate final electrical conductivity effluent limitation.

C. On 5 February 2009, the Regional Water Board adopted Order No. R5-2007-0132-01 amending Order No. R5-2007-0132 to extend the time schedule for compliance with effluent limitations for biochemical oxygen demand, total suspended solids, turbidity, total coliform organisms, aluminum, ammonia, and iron. The amended compliance schedule also included interim milestone dates for the Discharger to submit a preferred option for compliance and a specific reopener provision was adopted to include additional requirements and/or amend compliance dates to implement reuse of treated wastewater on Conaway Ranch if the Discharger determines that reuse is feasible.

~~C~~D. The Facility discharges wastewater to the Willow Slough Bypass and the Conaway Ranch Toe Drain, waters of the United States, and is currently regulated by Order 5-01-067 which was adopted on 16 March 2001 and expired on 16 March 2006. On 8 May 2003, effluent limitations for biochemical oxygen demand (BOD), total suspended solids (TSS), turbidity, settleable solids, chlorine residual, ammonia, bis(2-ethylhexyl)phthalate, persistent chlorinated hydrocarbon pesticides, copper, dioxin and congeners, PAH's and total coliform organisms were stayed by a State Water Board Stipulation Order Resolving Petition for Review (OCC File A-1374) (Stipulation). The Stipulation required the Regional Water Board to "develop the permit on remand in light of the current record and new information developed on remand." The terms and conditions of the current Order that were not subject to the stipulation have been automatically continued and remain in effect until new Waste Discharge Requirements and NPDES permit are adopted pursuant to this Order.

~~D~~E. The Discharger filed a report of waste discharge and submitted an application for renewal of its Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit on 1 September 2005. Supplemental information was requested on 15 September 2005 and received on 17 October 2005. A site visit was conducted on 31 January 2005, to observe operations and collect additional data to develop permit limitations and conditions.

II. FACILITY DESCRIPTION

The Discharger provides sewerage service for the City of Davis and serves a population of approximately 65,000. The WWTP design average dry weather flow capacity is 7.5 mgd.

A. Description of Wastewater and Biosolids Treatment or Controls

The treatment train is flexible and varies according to the flow and season and alternates between Discharge 001 and Discharge 002. The treatment train consists of screening; aerated grit removal; primary sedimentation; aerated ponds (used in winter operation); a lemna pond; oxidation ponds; overland flow; disinfection; and dechlorination for both Discharge 001 and Discharge 002. Discharge 002 additionally passes through treatment wetlands after disinfection and dechlorination. The wetlands include seven tracts, each constructed with flexibility to flow to adjacent downgradient cells. The wetlands has the ability to recirculate the treated flow from the latter two tracts to the first tract. Stormwater and domestic wastewater may be commingled in the wetlands. The overland flow fields are comprised of 160 acres of Fescue, Bermuda, and a variety of native and non-native grass and broadleaf species divided into 15 separate zones over which wastewater is distributed and allowed to sheet flow at a two percent slope.

Sludge is anaerobically digested in a primary and secondary digester and then is transferred to one of three unlined on-site lagoons to dry. Supernatant is directed to the headworks. Class B biosolids (satisfying minimum digestion time and tested by coliform samples) are land applied in September or October to a fifth (thirty-three acres) of the overland flow fields scheduled for periodic terrace renovation.

B. Discharge Points and Receiving Waters

1. The Facility is located in Section 29 and 30, T9N, R3E, MDB&M, as shown in Attachment B, a part of this Order.

2. Treated municipal wastewater is discharged at Discharge Point 001 to Willow Slough Bypass and is discharged at Discharge Point 002 to Conaway Ranch Toe Drain, waters of the United States tributary to the Yolo Bypass at the points Latitude 38^{o}, 35', 24" N and longitude 121^{o}, 39', 50" W (Discharge Point 001) and Latitude 38°, 34', 33"N and longitude 121°, 38', 02"W (Discharge Point 002). Discharge Points 001 and 002 are in the Lower Putah Creek Hydrologic Area (511.20) of the Valley Putah-Cache Hydrologic Unit.

3. Willow Slough Bypass and the Conaway Ranch Toe Drain have very low flow during the dry seasons. At times, flow upstream of the discharge in both receiving waters is immeasurably small or nonexistent. At times, effluent discharge from the Davis WWTP may provide the majority of the flow in Willow Slough Bypass, with little or no dilution from natural flow.

4. The Davis Restoration Treatment Wetlands were created through the City of Davis, US Army Corps of Engineers, Yolo Basin Foundation, and California Waterfowl Association. These wetlands were created to support restoration of wetlands in the northwestern flyway, provide additional wastewater treatment and stormwater treatment. In addition, the wetlands were seen to enhance wildlife habitat. The wetlands are used for guided tours for school children and others interested in wildlife. Public access to the Restoration Treatment Wetlands is controlled through the City of Davis in conjunction with the Yolo Basin Foundation.

5. The Willow Slough Bypass is tributary to the Conaway Ranch Toe Drain and both streams are tributary to the Yolo Bypass. The Yolo Bypass is tributary to the Sacramento/San-Joaquin Delta. Discharge Points 001 and 002 are located immediately before the location where Conaway Ranch Toe Drain and the Willow Slough Bypass discharge into the Yolo Bypass. Effluent from each outfall discharges to receiving waters tributary to the Yolo Bypass. The outfalls are located just upstream of the location where these tributaries enter the Yolo Bypass.

6. The Conaway Ranch Toe Drain and Willow Slough Bypass are used for the irrigation of crops and provide irrigation water to seasonal wetlands. The designated beneficial uses of the Yolo Bypass include agriculture. The December 2000 *Recreation, Land Use, and Dilution Study of the Tule Canal and Toe Drain* (Study) provided by the City of Woodland found that melons and tomatoes are grown in the Yolo Bypass. The State of California Department of Water Resources 1997 Yolo County Land Use Survey shows tomatoes and either melons, squash, or cucumbers grown in the Yolo Bypass in the vicinity of the City's discharge.

7. The designated beneficial uses of the Yolo Bypass include water contact recreation. The Study discussed in the preceding paragraph found that recreational fishing (including human consumption of fish) and swimming occurs within the Yolo Bypass.

8. The designated beneficial uses of the Yolo Bypass include warm freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat and potential cold freshwater aquatic habitat. The *Habitat Improvement for Native Fish in the Yolo Bypass*, states that "considering the four runs of salmon present, adult migration may occur in any month," which indicates the presence of salmonids in the Yolo Bypass year-round.

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

Effluent limitations/Discharge Specifications contained in the previous Order for discharges from Discharge Points 001 and 002 (Monitoring Locations EFF-001 and EFF-002) and representative monitoring data from the term of the previous Order are as follows:

Table F-2. Historic Effluent Limitations and Monitoring Data – Discharge 001

Parameter	Units	Effluent Limitation						Monitoring Data (From September 2002 – To September 2005)				
						Instananeous		Highest				Lowest
		Average Monthly	Average Weekly	Maximum Daily	Monthly Median	Minimum	Maximum	Average Monthly	Average Weekly	Monthly Median	Daily	Daily
BOD[1]	mg/L lbs/day	30 1876	45[2] 2815	90[2] 5633				21.6 1246	26 1349		30 1854	
TSS	mg/L lbs/day	50 3129	75[2] 4694	150[2] 9388				54.7 2769	67 2769		82 4715	
Settleable Solids	mL/L	0.1		0.2				>0.1			0.1	
pH						6.5	8.5				8.1	7.2
Chlorine Residual	mg/L			0.02							2.95	
Total Coliform Organisms[3]	MPN/ 100mL			500	23					4	33	
Selenium	ug/L lbs/day		5.0 0.3						5.6 0.2			

1. 5-day, 20°C biochemical oxygen demand (BOD).
2. To be ascertained by a 24-hour composite.
3. The total coliform organism sample may be collected immediately following the disinfection process.

Table F-3. Historic Effluent Limitations and Monitoring Data – Discharge 002

Parameter	Units	Effluent Limitation						Monitoring Data (From September 2002– To September 2005)				
						Instananeous		Highest				Lowest
		Average Monthly	Average Weekly	Maximum Daily	Monthly Median	Minimum	Maximum	Average Monthly	Average Weekly	Monthly Median	Daily	Daily
BOD[1]	mg/L lbs/day	30 1876	45[2] 2815	90[2] 5633				21.1 587	24 1316		26 1750	
Total Suspended Solids	mg/L lbs/day	50 3129	75[2] 4694	150[2] 9388				83 2310	90.8 3248		126 3852	
Settleable Solids	mL/L	0.1		0.2				>0.1			0.3	
pH						6.5	8.5				8.7	7.0
Chlorine Residual	mg/L			0.02							0.00	
Total Coliform Organisms[3]	MPN/ 100mL			500	23					4	1600	
Selenium	ug/L lbs/day		5.0 0.3						3.4 0.2			

1. 5-day, 20°C biochemical oxygen demand (BOD).
2. To be ascertained by a 24-hour composite.
3. The total coliform organism sample may be collected immediately following the disinfection process.

For Both discharges 001 and 002:

The average dry weather (generally May through October) discharge flow shall not exceed 7.5 million gallons.

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

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

D. Compliance Summary

Waste Discharge Requirements Order No. 5-01-067 requires that survival of aquatic organisms in 96-hour bioassays of undiluted waste be no less than 70% for any one bioassay and 90% for the median of any three or more consecutive bioassays. As discussed in section IV.C.5 of this Fact Sheet, toxicity monitoring indicates that the Discharger has violated this effluent limitation.

The Discharger has exceeded the TSS monthly average and weekly average limitations and has exceeded the total coliform, settleable solids, and chlorine residual limitation.

The Discharger will evaluate the feasibility of reusing treated effluent at the Conaway Ranch for agricultural reuse to eliminate its surface water discharge. If reuse is not feasible, the Discharger is proposing to construct a new WWTP. Upon completion of the new tertiary facility, the character of the wastewater discharged will be significantly improved over the equivalent to secondary level of treatment currently provided. This Order contains limitations based on the discharge from the existing facility. According to the Discharger, if reuse is not feasible, the new treatment system will be designed with the goal of achieving full compliance with Waste Discharge Requirements. However, due to the nature of emerging contaminants, additional measures may be required after construction, but prior to the final compliance date, to assure that all emerging contaminants respond satisfactorily to the proposed treatment process. Based on a characterization of the discharge quality, following startup of the new WWTP, this Order may be reopened and modified.

E. Planned Changes

If reuse is not feasible and the Discharger finds it necessary to construct a new WWTP, the Discharger anticipates it will take longer than five years (one permit term) to complete the upgrade to tertiary. The Discharger has projected that a new tertiary treatment system could be completed as early as 2015 or as late as the end of 2018 for facilities to provide a tertiary (or equivalent) level of treatment and year-round nitrification/denitrification. The Discharger anticipates the new treatment system would be able to comply with priority pollutant water quality standards for all constituents except selenium. Removal of the overland flow system as part of the upgrade to tertiary would improve the effluent quality for most constituents, but would likely cause an increase in effluent selenium. Achieving compliance with the CTR effluent selenium limitations would most likely require a change in the City's water supply.

This Order includes a time schedule for the completion of tertiary treatment, as described in the Discharger's 25 July 2007 Infeasibility Report as the shortest practicable compliance schedule. This Order also incorporates time necessary to evaluate the feasibility of agricultural reuse at Conaway Ranch and the elimination of a surface water discharge. The Discharger anticipates that to conduct the necessary studies and evaluate the feasibility of reuse it will take two years from the adoption date of this Order. If the Discharger determines that it is not feasible prior to the end of the two year study period, the Discharger will immediately resume its plans to construct a new WWTP.

This Order contains limitations based on both the existing discharge and the discharge from the proposed tertiary facility if reuse at Conaway Ranch is determined to be infeasible.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this Order are based on the applicable plans, policies, and regulations identified in Section II of the Limitations and Discharge Requirements (Findings). This section provides supplemental information, where appropriate, for the plans, policies, and regulations relevant to the discharge.

A. Legal Authority

See Limitations and Discharge Requirements - Findings, Section II.C.

B. California Environmental Quality Act (CEQA)

See Limitations and Discharge Requirements - Findings, Section II.E.

C. State and Federal Regulations, Policies, and Plans

Water Quality Control Plans. The Regional Water Board adopted a *Water Quality Control Plan, Fourth Edition (Revised August 2006), for the Sacramento and San Joaquin River Basins* (Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. In addition, State Water Board Resolution No. 88-63 requires that, with certain exceptions, the Regional Water Board assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in the Basin Plan. Resolution No. 88-63 also states, "Any body of water which has a current specific designation previously assigned to it by a Regional Board in Water Quality Control Plans may retain that designation at the Regional Board's discretion." The Basin Plan specifically does not assign municipal and domestic supply as a beneficial use of the Yolo Bypass. In accordance with the tributary rule as described in Finding II.H, since the discharge is to tributaries of the Yolo Bypass just outside of the Yolo Bypass, this Order does not apply a beneficial use of municipal and domestic use to the receiving streams. This Order applies the Basin Plan-assigned beneficial uses of the Yolo Bypass to the receiving streams, which are as follows: agricultural supply; water contact recreation; non-contact water recreation; warm freshwater habitat; potential cold freshwater habitat; warm migration of aquatic organisms; cold migration of aquatic organisms; warm spawning, reproduction, and/or early development; and wildlife habitat.

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.

This Order contains Effluent Limitations requiring a tertiary level of treatment, or equivalent, which is necessary to protect the beneficial uses of the receiving water. The Regional Water Board has considered the factors listed in CWC section 13241 in establishing these requirements, as discussed in more detail in Section IV.C.3.o.

Antidegradation Policy. 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 No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. As discussed in detail in the Fact Sheet (Attachment F, Section IV.D.4.) the discharge is consistent with the antidegradation provisions of 40 CFR section 131.12 and State Water Board Resolution 68-16.

Anti-Backsliding Requirements. Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at title 40, Code of Federal Regulations section 122.44(l) prohibit 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. Compliance with the Anti-Backsliding requirements is discussed in Section IV.D.3.

Emergency Planning and Community Right to Know Act. Section 13263.6(a), California 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) (EPCRKA) 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 Emergency Planning and Community Right to Know Act (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 CWC 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.

Stormwater 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 stormwater program and are obligated to comply with the Federal Regulations.

Endangered Species Act. This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.. sections 1531 to 1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

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

1. Under section 303(d) of the 1972 Clean Water Act, states, territories and authorized tribes are required to develop lists of water quality limited segments. The waters on these lists do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. On 30 November 2006 USEPA gave partial approval to California's 2006 section 303(d) List of Water Quality Limited Segments. EPA approved the waters and pollutants identified in California's three part Section 303(d) list with the exception of Walnut Creek for toxicity and may identify additional waters and pollutants for inclusion on the 303(d) list if necessary. 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 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." Neither the Conaway Ranch Toe Drain, the Willow Slough Bypass, nor the Yolo Bypass are listed on California's 2006 section 303(d) List of Water Quality Limited Segments. The listing for the Sacramento/San Joaquin Delta (northern delta), to which the receiving waters are tributary, includes: chlorpyrifos, DDT, diazinon, exotic species, group A pesticides, mercury, polychlorinated biphenyls, and unknown toxicity. This Order includes monitoring for mercury and unknown toxicity.

Chlorpyrifos, DDT, diazinon, group A pesticides (a type of persistent chlorinated hydrocarbon pesticide), and polychlorinated biphenyls were not detected in the effluent, but the Discharger's Report of Waste Discharge showed pentachlorophenol (a persistent chlorinated hydrocarbon pesticide) was detected in Discharge 001 above the numerical water quality objective. The Discharger has provided the Regional Water Board with information indicating that the detected sample for pentachlorophenol was the result of laboratory error and that the detected sample was analyzed using the incorrect EPA method. Another sample taken the same day and analyzed using the correct EPA method resulted in pentachlorophenol being not detected. Due to laboratory error, the Regional Water Board has excluded the detected result for pentachlorophenol from its reasonable potential analysis. Therefore, this Order does not contain effluent limitations for chlorpyrifos, DDT, diazinon, group A pesticides, and polychlorinated biphenyls in both Discharge 001 and Discharge 002. The effluent in both Discharge 001 and Discharge 002 showed toxicity and this Order includes an acute toxicity limitation for both Discharge 001 and Discharge 002. Mercury was detected in both Discharge 001 and Discharge 002 at concentrations below the numerical water quality objective. Therefore, this Order does not contain effluent concentration-based limitations for mercury. However, because mercury is a bioaccumulative constituent, the discharge of mercury to the Willow Slough Bypass and Conaway Ranch Toe Drain may impact the downstream Sacramento/San Joaquin Delta as a mass loading, and an effluent mass limitation for mercury is included in this Order.

2. **Total Maximum Daily Loads.** The USEPA requires the Regional Water Board to develop total maximum daily loads (TMDLs) for each 303(d) listed pollutant and water body combination. A TMDL has not yet been established for mercury in the Sacramento/San Joaquin Delta. Therefore, this Order contains a performance-based effluent mass limitation for mercury for the effluent discharge to the Willow Slough Bypass and Conaway Ranch Toe Drain to maintain the mercury loading at the current level until a total maximum daily load (TMDL) can be established and EPA develops mercury standards that are protective of human health.

E. Other Plans, Polices and Regulations

1. The discharge authorized herein and the treatment and storage facilities associated with the discharge of treated municipal wastewater, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, California Code of Regulations (CCR), section 20005 *et seq*. (hereafter Title 27). The

exemption, pursuant to Title 27 CCR section 20090(a), is based on the following:

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

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

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

2. The State Water Board adopted the *Water Quality Control Policy for the Enclosed Bays and Estuaries of California*. The requirements within this Order are consistent with the Policy.

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 Clean Water Act (CWA) and amendments thereto are applicable to the discharge.

The Federal 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 section 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that "*are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any state water quality standard, including state narrative criteria for water quality*." Federal Regulations, 40 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 discharges 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: 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 water quality-based effluent limitations 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 Regional Water Board's Basin Plan, page IV-17.00, contains an implementation policy ("Policy for Application of Water Quality Objectives" that specifies that the Regional Water Board "*will, on a case-by-case basis,*

adopt numerical limitations in orders which will implement the narrative objectives." This Policy complies with 40 CFR §122.44(d)(1). With respect to narrative objectives, the Regional Water Board must establish effluent limitations using one or more of three specified sources, including (1) EPA's published water quality criteria, (2) a proposed state criterion (*i.e.*, water quality objective) or an explicit state policy interpreting its narrative water quality criteria (*i.e.*, the Regional Water Board's "Policy for Application of Water Quality Objectives")(40 CFR 122.44(d)(1) (vi) (A), (B) or (C)), or (3) an indicator parameter. The Basin Plan contains a narrative objective requiring that: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life*" (narrative toxicity objective). The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, discoloration, toxic substances, radionuclides, or taste and odor producing substances that adversely affect beneficial uses. 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 Basin Plan also limits chemical constituents in concentrations that adversely affect surface water beneficial uses.

A. Discharge Prohibitions

1. 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.

B. Technology-Based Effluent Limitations

1. Scope and Authority

Following publication of the secondary treatment regulations, legislative history indicates that Congress was concerned that USEPA had not "sanctioned" the use of certain biological treatment techniques that were effective in achieving significant reductions in BOD_5 and TSS for secondary treatment. Therefore to prevent unnecessary construction of costly new facilities, Congress included language in the 1981 amendment to the Construction Grants statues [section 23 of Pub. L. 97-147] that required USEPA to provide allowance for alternative biological treatment technologies such as trickling filters or waste stabilization ponds. In response to this requirement, definition of secondary treatment was modified on 20 September 1984 and 3 June 1985, and published in the revised secondary treatment regulations contained in section 133.105. These regulations allow alternative limitations for facilities using trickling filters and waste stabilization ponds that meet the requirements for "equivalent to secondary treatment." These "equivalent to secondary treatment" limitations are *up to* 45 mg/L (monthly average) and *up to* 65 mg/L (weekly average) for BOD_5 and TSS.

Therefore, POTWs that use waste stabilization ponds, identified in section 133.103, as the principal process for secondary treatment and whose operation and maintenance data indicate that the TSS values specified in the equivalent-to-secondary regulations cannot be achieved, can qualify to have their minimum levels of effluent quality for TSS adjusted upwards.

Furthermore, in order to address the variations in facility performance due to geographic, climatic, or seasonal conditions in different States, the Alternative State Requirements (ASR) provision contained in section 133.105(d) was written. ASR allows States the flexibility to set permit limitations above the maximum levels of 45 mg/L (monthly average) and 65 mg/L (weekly average) for TSS from lagoons. However, before ASR limitations for suspended solids can be set, the effluent must meet the BOD limitations as prescribed by 40 section 133.102(a). Presently, the maximum TSS value set by the State of California for lagoon effluent is 95 mg/L. This value corresponds to a 30-day consecutive average or an average over duration of less than 30 days.

In order to be eligible for equivalent-to-secondary limitations, a POTW must meet all of the following criteria:

- The principal treatment process must be either a trickling filter or waste stabilization pond.
- The effluent quality consistently achieved, despite proper operations and maintenance, is in excess of 30 mg/L BOD_5 and TSS.
- Water quality is not adversely affected by the discharge. (40 CFR § 133.101(g).)

The treatment works as a whole provides significant biological treatment such that a minimum 65 percent reduction of BOD_5 is consistently attained (30-day average).

2. Applicable Technology-Based Effluent Limitations

a. **BOD_5 and TSS.** Federal Regulations, 40 CFR, Part 133, establish the minimum weekly and monthly average level of effluent quality attainable by secondary treatment for BOD_5 and TSS. Tertiary treatment is necessary to protect the beneficial uses of the receiving stream and the final effluent limitations for BOD_5 and TSS are based on the technical capability of the tertiary process. BOD_5 is a measure of the amount of oxygen used in the biochemical oxidation of organic matter. The secondary and tertiary treatment standards for BOD_5 and TSS are indicators of the effectiveness of the treatment processes. 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. In applying 40 CFR Part 133 for weekly and monthly average BOD_5 and TSS limitations, 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; the 30-day average BOD_5 and TSS limitations have been revised to 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. See Table F-~~3~~4 for final technology-based effluent limitations required by this Order. In addition, 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. If 85 percent removal of BOD_5 and TSS must be achieved by a secondary treatment plant, it must also be achieved by a tertiary (i.e., treatment beyond secondary level) treatment plant. This Order contains a limitation requiring an average of 85 percent removal of BOD_5 and TSS over each calendar month.

b. **Flow.** Monitoring data from September 2002 through September 2005 shows the dry weather flow is typically 5.5 to 6.0 mgd and has remained fairly constant. The Facility was designed to provide an equivalent to secondary level of treatment for up to an average dry weather design flow of 7.5 mgd. Therefore, this Order contains an Average Dry Weather Discharge Flow effluent limit of 7.5 mgd.

Summary of Technology-based Effluent Limitations
Discharge Points –001 and 002

Table F-4. Summary of Technology-based Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
BOD_5	mg/L	10	15	20		
	lbs/day[1]	630	940	1300		
	% removal	85				
TSS	mg/L	10	15	20		
	lbs/day[1]	630	940	1300		
	% removal	85				
pH	standard units				6.5	8.5

1. Based on 7.5 mgd (permitted flow) times limit in mg/L times 8.3454 (conversion factor).

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

As specified in CFR 122.44(d)(1)(i), permits are required to include WQBELs for pollutants (including toxicity) that are or may be discharged at levels that cause, have reasonable potential to cause, or contribute to an in-stream excursion above any state water quality standard. 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

a. **Receiving Water.** Discharge 001 is to the Willow Slough Bypass and Discharge 002 is to the Conaway Ranch Toe Drain. Refer to Section III for the beneficial uses of the receiving water.

b. **Metal Translators.** Federal Regulations at 40 CFR 122.45(c) require that permit effluent limits for metals shall be expressed as "total recoverable metal" as defined in 40 CFR part 136. The criteria for metals is typically in the form of "dissolved metal", therefore, a dissolved-to-total metal translator is needed to convert the dissolved concentrations to total recoverable when calculating water quality-based effluent limits.

For priority pollutant metals, the SIP at section 1.4.1 requires the use of USEPA default translators specified in the CTR. Alternatively, the SIP allows the use of site-specific metals translators that "…can be developed from field data by either direct determination of the fraction dissolved, or by development of a site-specific partition coefficient that relates the fraction dissolved to ambient background conditions such as pH, suspended load, or organic carbon."

The Discharger submitted a study titled, "Metals translator Monitoring Study – Copper, Lead and Nickel", dated January 2007, which was developed in accordance with the SIP and USEPA guidance[1]. The Discharger requested the use of site-specific metals translators for copper, nickel, and lead for Discharge Point 001 (Willow Slough Bypass) based on the results of the study.

During the study, the Discharger collected water quality data twice a week for a 5-week period during low receiving water conditions, which is recommended by USEPA's guidance. Samples were collected of the effluent at Discharge 001 and in Willow Slough Bypass approximately 3 miles downstream of Discharge 001. Metals translators were developed for copper, nickel, and lead in accordance with the SIP and USEPA's guidance as shown in Table F-5, below.

Table F-5. Summary of Site Specific Translators

	Acute		Chronic	
	Receiving Water	Effluent	Receiving Water	Effluent
Copper	0.32	0.68	0.37	0.58
Lead	0.17	0.81	0.20	0.65
Nickel	0.54	0.78	0.37	0.71

The Study results demonstrate that the dissolved fractions in the effluent are greater than in the downstream mixed receiving water. A mixing zone has not been allowed in this Order. Therefore, site-specific translators based on the mixed downstream receiving water monitoring data are not appropriate, because end-of-pipe effluent limits are required. The site-specific translators for copper, lead, and nickel based on the effluent monitoring data are appropriate for development of end-of-pipe water quality-based effluent limits. Therefore, this Order allows the use of the site-specific metals translators based on the effluent, as shown in Table F-5, above.

c. **Hardness Dependant 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-dependant criteria include cadmium, copper, chromium III, lead, nickel, silver, and zinc.

[1] "The Metals Translator: Guidance For Calculating a Total Recoverable Permit Limit from a Dissolved Criterion", EPA 823-B-96-007, June 1996

This Order has established the criteria for hardness-dependant metals based on the reasonable worst-case ambient hardness as required by the SIP[2], the CTR[3], and State Water Board Order No. WQO 2008-0008 (City of Davis). The SIP and the CTR require the use of "receiving water" or "actual ambient" hardness, respectively, to determine effluent limitations for these metals (SIP, § 1.2; 40 CFR § 131.38(c)(4), Table 4, note 4.) The CTR does not define whether the term "ambient," as applied in the regulations, necessarily requires the consideration of upstream as opposed to downstream hardness conditions. In some cases, the hardness of effluent discharges changes the hardness of the ambient receiving water. 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 Regional Water Board thus has considerable discretion in determining ambient hardness (*Id.*, p.10.).

The hardness values must also be protective under all flow conditions (*Id.*, pp. 10-11). As discussed below, scientific literature provides a reliable method for calculating protective hardness-dependent CTR criteria, considering all discharge conditions. This methodology produces criteria that ensure these metals do not cause receiving water toxicity, while avoiding criteria that are unnecessarily stringent.

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

- For comparing the MEC to the applicable criterion, in accordance with the SIP, CTR, and Order WQO 2008-0008, the reasonable worst-case downstream hardness was used to adjust the criterion. In this evaluation, the portion of the receiving water affected by the discharge is analyzed. For hardness-dependant criteria, the hardness of the effluent has an impact on the determination of the applicable criterion in areas in the receiving water affected by the discharge. Therefore,

[2] The SIP does not address how to determine the hardness for application to the equations for the protection of aquatic life when using hardness-dependant 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.

[3] 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 withy the design discharge conditions for design flows and mixing zones.

for this situation it is necessary to consider the hardness of the effluent in determining the applicable hardness to adjust the criterion. The procedures for determining the applicable criterion after proper adjustment using the reasonable worst-case downstream hardness is outlined in subsection ii, below.

- For comparing the Maximum Ambient Background Concentration to the applicable criterion, in accordance with the SIP, CTR, and Order WQO 2008-0008, the reasonable worst-case upstream hardness was used to adjust the criterion. In this evaluation, the area outside the influence of the discharge is analyzed. For this situation, the discharge does not impact the upstream hardness. Therefore, the effect of the effluent hardness was not included in this evaluation.

  Discharge Point No. 001 (Willow Slough Bypass). Upstream receiving water hardness data for Willow Slough Bypass ranged from 78 to 800 mg/L (as $CaCO_3$), based on 104 samples from 4 January 2005 to 9 February 2009. The minimum observed upstream receiving water hardness, 78 mg/L as $CaCO_3$, was used to adjust the CTR criteria when comparing Maximum Background Ambient Concentration to the criterion for Discharge 001.

  Discharge Point No. 002 (Conaway Ranch Toe Drain). Upstream receiving water hardness data for Conaway Ranch Toe Drain ranged from 85 mg/L to 560 mg/L (as $CaCO_3$), based on 35 samples from 3 February 2005 to 2 April 2008. The minimum observed upstream receiving water hardness of 85 mg/L (as $CaCO_3$) was used to adjust the CTR criteria when comparing the Maximum Ambient Concentration to the criterion for Discharge 002.

ii. **Effluent Concentration Allowances (ECA) Calculations.** A 2006 Study[4] developed procedures for calculating the effluent concentration allowance (ECA)[5] for CTR hardness-dependent metals. The 2006 Study demonstrated that it is necessary to evaluate all discharge conditions (e.g. high and low flow conditions) and the hardness and metals concentrations of the effluent and receiving water when determining the appropriate ECA for these hardness-dependent metals. Simply using the lowest recorded upstream receiving water hardness to calculate the ECA may result in over or under protective water quality-based effluent limitations.

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

[4] 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.

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

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

Where:

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

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

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

ECA = C (when C ≤ B)[6] (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, chromium III, copper, nickel, and zinc. These metals are hereinafter referred to as "Concave Down Metals". "Concave Down" refers to the shape of the curve represented by the relationship between hardness and the CTR criteria in Equation 1. Another similar procedure can be used for determining the ECA for acute cadmium, lead, and acute silver, which are referred to hereafter as "Concave Up Metals".

ECA for Concave Down Metals – For Concave Down Metals (i.e., chronic cadmium, chromium III, copper, nickel, and zinc) the 2006 Study demonstrates that when the effluent is in compliance with the CTR criteria and the upstream receiving water is in compliance with the CTR criteria, any mixture of the effluent and receiving water will always be in compliance with the CTR criteria. Therefore, based on any observed ambient background hardness, no receiving water assimilative capacity for metals (i.e., ambient background metals concentrations are at their respective CTR criterion) and the minimum effluent hardness, the ECA calculated using Equation 1 with a hardness

[6] The 2006 Study assumes the ambient background metals concentration is equal to the CTR criterion (i.e. C ≤ B)

equivalent to the minimum effluent hardness is protective under all discharge conditions (i.e., high and low dilution conditions and under all mixtures of effluent and receiving water as the effluent mixes with the receiving water). This is applicable whether the effluent hardness is less than or greater than the ambient background receiving water hardness.

Willow Slough Bypass (Discharge Point No. 001) and Conaway Ranch Toe Drain (Discharge Point No. 002) - The effluent hardness for Discharge 001 and 002 ranged from 260 mg/L to 610 mg/L (as $CaCO_3$), based on 33 samples from 11 January 2005 to 2 March 2009. The upstream receiving water hardness varied from 78 mg/L to 800 mg/L (as $CaCO_3$), for the Willow Slough Bypass, based on 104 samples from 4 January 2005 to 9 February 2009, and ranged from 85 mg/L to 560 mg/L (as $CaCO_3$), for the Conaway Ranch Toe Drain, based on 35 samples from 3 February 2005 to 2 April 2008. Using a hardness of 260 mg/L (as $CaCO_3$) to calculate the ECA for all Concave Down Metals will result in water quality-based effluent limitations that are protective under all potential effluent/receiving water mixing scenarios and under all known hardness conditions, as demonstrated in the example using copper shown in Table F-6, below. This example assumes the following conservative conditions for the upstream receiving water:

- Upstream receiving water always at the lowest observed upstream receiving water hardness (i.e., 78 mg/L as $CaCO_3$).
- Upstream receiving water copper concentration always at the CTR criteria (i.e., no assimilative capacity). Based on available data, the receiving waters (i.e., Willow Slough Bypass and Conaway Ranch Toe Drain) never exceeded the CTR criteria for any metal with hardness-dependent criteria.

As demonstrated in Table F-6, using a hardness of 260 mg/L (as $CaCO_3$) for Discharge 001 and Discharge 002 to calculate the ECA for Concave Down Metals ensures the discharge is protective under all discharge and mixing conditions. In this example, the effluent is in compliance with the CTR criteria and any mixture of the effluent and receiving water is in compliance with the CTR criteria. An ECA based on a lower hardness (e.g. lowest upstream receiving water hardness) would also be protective, but would result in unreasonably stringent effluent limits considering the known conditions. Therefore, in this Order the ECA for all Concave Down Metals for Discharge 001 and Discharge 002 has been calculated using Equation 1 with a hardness of 260 mg/L (as $CaCO_3$).

Table F-6. Copper ECA Evaluation (Discharge 001)

Minimum Observed Effluent Hardness	260 mg/L (as $CaCO_3$)
Minimum Observed Upstream Receiving Water Hardness	78 mg/L (as $CaCO_3$)

Maximum Assumed Dissolved Upstream Receiving Water Copper Concentration			7.4 µg/L[1]
Dissolved Copper $ECA_{chronic}$[2]			20.3 µg/L
Effluent Fraction	Mixed Downstream Ambient Concentration		
	Hardness[3] (mg/L) (as $CaCO_3$)	CTR Criteria[4] (µg/L)	Copper[5] (µg/L)
1%	79.82	7.4	7.4
5%	87.1	8.0	7.9
15%	105.3	9.4	9.2
25%	123.5	10.7	10.5
50%	169	14.0	13.8
75%	214.5	17.2	17.0
100%	260	20.3	20.3

[1] Maximum assumed upstream receiving water dissolved copper concentration calculated using Equation 1 for chronic criterion at a hardness of 78 mg/L (as $CaCO_3$).

[2] Dissolved ECA calculated using Equation 1 for chronic criterion at a hardness of 260 mg/L (as $CaCO_3$).

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

[4] Mixed downstream ambient criteria (as dissolved) are the chronic criteria calculated using Equation 1 at the mixed hardness.

[5] Mixed downstream ambient copper concentration (dissolved) is the mixture of the receiving water and effluent dissolved copper concentrations at the applicable effluent fraction.

ECA for Concave Up Metals - For Concave Up Metals (i.e., acute cadmium, lead, and acute silver), the 2006 Study demonstrates that due to a different relationship between hardness and the metals criteria, the effluent and upstream receiving water can be in compliance with the CTR criteria, but the resulting mixture may be out of compliance. Therefore, the 2006 Study provides a mathematical approach to calculate the ECA to ensure that any mixture of effluent and receiving water is in compliance with the CTR criteria (see Equation 3, below). The ECA, as calculated using Equation 3, is based on the reasonable worst-case ambient background hardness, no receiving water assimilative capacity for metals (i.e., ambient background metals concentrations are at their respective CTR criterion), and the minimum observed effluent hardness. The reasonable worst-case ambient background hardness depends on whether the effluent hardness is greater than or less than the upstream receiving water hardness. There are circumstances where the conservative ambient background hardness assumption is to assume that the upstream receiving water is at the highest observed hardness concentration. The conservative upstream receiving water condition as used in the Equation 3 below is defined by the term H_{rw}.

$$ECA_{I} = \left(\frac{m(H_e - H_{rw})\left(e^{m\{\ln(H_{rw})\}+b}\right)}{H_{rw}} \right) + e^{m\{\ln(H_{rw})\}+b} \qquad \text{(Equation 3)}$$

m, b = criterion specific constants (from CTR)san jose

H_e = minimum observed effluent hardness

H_{rw} = minimum observed upstream receiving water hardness when the minimum effluent hardness is always greater than observed upstream receiving water hardness ($H_{rw} < H_e$)

-or-

maximum observed upstream receiving water hardness when the minimum effluent hardness is always less than observed upstream receiving water hardness ($H_{rw} > H_e$)[7]

Willow Slough Bypass (Discharge 001) and Conaway Ranch Toe Drain (Discharge Point No. 002) - A similar example as was done for the Concave Down Metals is shown for silver, a Concave Up Metal, in Tables F-6 and F-7, below. As previously mentioned, the minimum effluent hardness is 260 mg/L (as $CaCO_3$), while the upstream receiving water hardness ranged from 78 mg/L to 800 mg/L[8] (as $CaCO_3$) for the Willow Slough Bypass. In this case, the minimum effluent concentration is within the range of observed upstream receiving water hardness concentrations. Therefore, Equation 3 was used to calculate two ECAs, one based on the minimum observed upstream receiving water hardness and one based on the maximum observed upstream receiving water hardness. Using Equation 3, the lowest ECA results from using the minimum upstream receiving water hardness, the minimum effluent hardness, and assuming no receiving water assimilative capacity for silver (i.e., ambient background lead concentration is at the CTR chronic criterion).

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

[8] A hardness of 400 mg/L (as $CaCO^3$) was used for the maximum receiving water hardness. The CTR requires a maximum hardness of 400 mg/L (as $CaCO^3$) for use in the metals criteria equations.

Table F-7. Silver ECA Evaluation Using Minimum Receiving Water Hardness (Discharge 001)

Minimum Observed Effluent Hardness	260 mg/L (as $CaCO_3$)
Minimum Observed Upstream Receiving Water Hardness	78 mg/L (as $CaCO_3$)
Maximum Assumed Upstream Receiving Water Silver Concentration	2.8 µg/L[1]
Silver ECA_{acute}[2]	13.3 µg/L

Effluent Fraction	**Mixed Downstream Ambient Concentration**		
	Hardness[3] (mg/L) (as $CaCO_3$)	**CTR Criteria[4] (µg/L)**	**Silver[5] (µg/L)**
1%	79.8	2.8	2.8
5%	87.1	3.2	3.2
15%	105.3	4.4	4.2
25%	123.5	5.8	5.3
50%	169.0	10.0	8.0
75%	214.5	15.1	10.6
100%	260.0	21.0	13.3

[1] Maximum assumed upstream receiving water silver concentration calculated using Equation 1 for acute criterion at a hardness of 78 mg/L (as $CaCO_3$).

[2] ECA calculated using Equation 3 for acute criteria.

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

[4] Mixed downstream ambient criteria and the acute criteria calculated using Equation 1 at the mixed hardness.

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

Table F-8. Silver ECA Evaluation Using Maximum Receiving Water Hardness (Discharge 001)

Minimum Observed Effluent Hardness	260 mg/L (as $CaCO_3$)
Maximum Observed Upstream Receiving Water Hardness	400 mg/L (as $CaCO_3$)
Maximum Assumed Upstream Receiving Water Silver Concentration	43.7 µg/L[1]
Silver ECA_{acute}[2]	17.5 µg/L

Effluent Fraction	**Mixed Downstream Ambient Concentration**		
	Hardness[3] (mg/L) (as $CaCO_3$)	**CTR Criteria[4] (µg/L)**	**Silver[5] (µg/L)**
1%	398.6	43.8	43.7
5%	393.0	42.7	42.
15%	379.0	40.1	39.4
25%	365.0	37.6	36.4
50%	330.0	31.6	28.7
75%	295.0	26.1	21.0
100%	260.0	21.0	13.3

[1] Maximum assumed upstream receiving water silver concentration calculated using Equation 1 for chronic criterion at a hardness of 400 mg/L (as $CaCO_3$).

[2] ECA calculated using Equation 3 for acute criteria.

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

[4] Mixed downstream ambient criteria and the acute criteria calculated using Equation 1 at the mixed hardness.

[5] Mixed downstream ambient silver concentration is the mixture of the receiving water and effluent silver concentrations at the applicable effluent fraction.

Using Equation 3 to calculate the ECA for all Concave Up Metals will result in water quality-based effluent limitations that are protective under all potential effluent/receiving water mixing scenarios and under all known hardness conditions, as demonstrated in Tables F-6 and F-7, for silver. In this example, the effluent is in compliance with the CTR criteria and any mixture of the effluent and receiving water is in compliance with the CTR criteria. Use of a lower ECA (e.g., calculated based solely on the lowest upstream receiving water hardness) is also protective, but would lead to unreasonably stringent effluent limits considering the known conditions. Therefore, Equation 3 has been used to calculate the ECA for all Concave Up Metals in this Order.

Table F-9 summarizes the ECAs calculated for all hardness-dependant metals.

Table F-9. Summary of ECA Evaluations for Discharge 001 and Discharge 002

Metals	Effluent Concentration Allowances, ECAs (ug/L) as total recoverable metals			
	Discharge 001		Discharge 002	
	acute	chronic	acute	chronic
Copper	49[1]	35[1]	34	21
Chromium III	1417	169	1520	181
Cadmium	12	5.2	12	5.2
Lead	134[1]	8.6[1]	240	9.4
Nickel	1300[1]	160[1]	1100	120
Silver	13	-	14	-
Zinc	270	270	270	270

[1] Site specific metal translators used for copper, lead, and nickel at Discharge 001.

~~While no effluent limitation for hardness is necessary in this Order, hardness is critical to the assessment of the need for, and the development of, effluent limitations for certain metals. The *California Toxics Rule*, at (c)(4), states the following:~~

~~"Application of metals criteria. (i) *For purposes of calculating freshwater aquatic life criteria for metals from the equations in paragraph (b)(2) of this section, for waters with a hardness of 400 mg/L or less as calcium carbonate, the actual ambient hardness of the surface water shall be used in those equations*." [emphasis added]~~

~~The State Water Board, in footnote 19 to Water Quality Order No. 2004-0013, stated: "*We note that…the Regional Water Board…applied a variable hardness value whereby effluent limitations will vary depending on the actual, current hardness values in the receiving water. We recommend that the Regional Water Board establish either fixed or seasonal effluent limitations for metals, as provided in the SIP, rather than 'floating' effluent limitations*."~~

~~Effluent limitations for the discharge must be set to protect the beneficial uses of the receiving water for all discharge conditions. In the absence of the option of including condition-dependent, "floating" effluent limitations that are reflective of actual conditions at the time of discharge, effluent limitations must be set using a reasonable worst-case condition in order to protect beneficial uses for all discharge conditions. For purposes of establishing water quality-based effluent limitations, a hardness value of 190 mg/L as $CaCO_3$ was used for discharges from Discharge 001 and a hardness value of 250 mg/L as $CaCO_3$ was used for discharges from Discharge 002. These were based on a reported Willow Slough Bypass hardness of 190 mg/L as $CaCO_3$ on 3 August 2004 and a reported Conaway Ranch Toe Drain hardness of 250 mg/L as $CaCO_3$ on 16 July 2001, which were the lowest hardness values during low flow periods from May 2001 through May 2005 of samples that have not been centrifuged. A centrifuged sample does not include particulates and hardness results of a centrifuged~~

~~sample may not be representative of the total hardness of the actual conditions in the receiving stream. The two lowest reported hardness values for the Willow Slough Bypass between May 2002 and May 2005 were 56 mg/L as $CaCO_3$ on 15 December 2002 and 58 mg/L as $CaCO_3$ on 19 December 2002. These values were not used because they were not taken during the low flow periods. Additionally, the Discharger certified by letter dated 1 February 2007 that these receiving stream samples had been centrifuged and therefore these samples were disregarded. Of samples that were not centrifuged, the lowest hardness in the Willow Slough Bypass and Conaway Ranch Toe Drain from May 2002 through May 2005 were 74 mg/L as $CaCO_3$ on 4 January 2005 and of 138 mg/L as $CaCO_3$ on 22 February 2005, respectively. However, these values were not used because they were not taken during low flow periods.~~

c. Assimilative Capacity/Mixing Zone

The State Water Resources Control Board Water Quality Order (WQO) No. 2002-0015, states that the use of the harmonic mean to determine flow rates is inappropriate for ephemeral streams where there is no consistent background dilution. The impact of considering a receiving stream to be ephemeral is that all limitations are "end of pipe" without any benefit of dilution. Since the receiving streams' flows are, at times, immeasurably small to nonexistent, this Order contains "end of pipe" limitations, with no dilution credits.

3. Determining the Need for WQBELs

a. CWA section 301 (b)(1) requires NPDES permits to include effluent limitations that achieve technology-based standards and any more stringent limitations necessary to meet water quality standards. Water quality standards include Regional Water Board Basin Plan beneficial uses and narrative and numeric water quality objectives, State Water Board-adopted standards, and federal standards, including the CTR and NTR. The Basin Plan includes numeric site-specific water quality objectives and narrative objectives for toxicity, chemical constituents, 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.) With regards to the narrative chemical constituents objective, the Basin Plan 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 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.*"

b. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or

contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, the Regional Water Board finds that the Discharge 001 and Discharge 002 1) each have a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for selenium, aluminum, ammonia, chlorine residual, and iron; and 2) each exceed the agricultural water quality screening values for electrical conductivity (EC), total dissolved solids (TDS), boron, sodium, chloride, and manganese. Additionally, Discharge 001 has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for cyanide. Water quality-based effluent limitations (WQBELs) for selenium, aluminum, ammonia, chlorine residual, iron, and cyanide are included in this Order. At this time, manganese, boron, chloride, sodium, TDS, and EC do not have a final limitation, as described in Sections IV.C.4.m, IV.C.4.q and IV.C.4.t. A detailed discussion of the RPA for each constituent is provided below. In response to the 16 May 2005 Alameda Court Order Granting Writ of Administrative Mandamus for the City of Woodland, the RPA for each constituent was typically based on about three years of data. Unless otherwise noted, the data used in the reasonable potential analysis and effluent limitations was from January 2002 through May 2005 for CTR constituents, and May 2002 through May 2005 for non-CTR constituents. The RPA dataset used for CTR constituents was greater than three years to include all of the 13267 priority pollutant data collected in 2002.

c. The Regional Water Board conducted the RPA in accordance with section 1.3 of the SIP. Although the SIP applies directly to the control of CTR priority pollutants, the State Water Board has held that the Regional Water Board may use the SIP as guidance for water quality-based toxics control.[9] The SIP states in the introduction "*The goal of this Policy is to establish a standardized approach for permitting discharges of toxic pollutants to non-ocean surface waters in a manner that promotes statewide consistency."* Therefore, in this Order the RPA procedures from the SIP were used to evaluate reasonable potential for both CTR and non-CTR constituents.

d. WQBELs were calculated in accordance with section 1.4 of the SIP, as described in Attachment F, Section IV.C.4.

e. **Aluminum.** USEPA developed National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for aluminum. The recommended four-day average (chronic) and one-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. USEPA recommends that the ambient criteria are protective of the aquatic beneficial uses of receiving waters in lieu of site-specific criteria. U.S. EPA Document 440/5-86-008, *Ambient Water Quality Criteria for Aluminum*, August 1988, contains the following national criteria for aluminum: "The procedures described in the 'Guidelines for Deriving Numerical National Water

[9] See, Order WQO 2001-16 (Napa) and Order WQO 2004-0013 (Yuba City)

Quality Criteria for the Protection of Aquatic Organisms and Their Uses' indicate that, except possibly where a locally important species is very sensitive, freshwater aquatic organisms and their uses should not be affected unacceptably, when the pH is between 6.5 and 9.0, if the four-day average concentration of aluminum does not exceed 87 µg/L more than once every three years on the average and if the one-hour average concentration does not exceed 750 µg/L more than once every three years on the average." The Ambient Criteria for aluminum is not restricted based on hardness.

The observed maximum concentration for aluminum in Discharge 001 was 700 µg/L, based on eight samples collected between May 2002 and May 2005, while the maximum observed upstream Willow Slough aluminum concentration was 700 µg/L, based on one sample collected in 2002. The observed maximum concentration for aluminum in Discharge 002 was 3200 µg/L, based on ten samples collected between May 2002 and May 2005, while the maximum observed upstream Conaway Ranch Toe Drain aluminum concentration was 3500 µg/L, based on one sample collected in 2002. Therefore, aluminum in both discharges has a reasonable potential to cause or contribute to an in-stream excursion above a level necessary to protect aquatic life resulting in a violation of the Basin Plan's narrative toxicity objective. This Order contains final Average Monthly Effluent Limitations (AMEL) and Maximum Daily Effluent Limitations (MDEL) for aluminum of 71 µg/L and 140 µg/L, respectively, based on USEPA's National Ambient Water Quality Criteria for the protection of freshwater aquatic life for both discharges. (See Attachment F, Tables F-6a and F-6b for WQBEL calculations).

In USEPA's *Ambient Water Quality Criteria for Aluminum—1988* [EPA 440/5-86-008], USEPA states that "[a]*cid-soluble aluminum…is probably the best measurement at the present…*"; however, USEPA has not yet approved an acid-soluble test method for aluminum. Replacing the ICP/AES portion of the analytical procedure with ICP/MS would allow lower detection limits to be achieved. Based on USEPA's discussion of aluminum analytical methods, this Order allows the use of the alternate aluminum testing protocol described above to meet monitoring requirements.

Based on the sample results in the effluent, it appears that the Discharger may be in immediate non-compliance upon issuance of the permit. New or modified control measures may be necessary in order to comply with the effluent limitations, and the new or modified control measures cannot be designed, installed and put into operation within 30 calendar days. The Basin Plan for the Sacramento and San Joaquin River Basins includes a provision that authorizes the use of compliance schedules in NPDES permits for water quality objectives adopted after 25 September 1995 (See Basin Plan at page IV-16). The water quality-based effluent limitations for aluminum are based on a new interpretation of the narrative standard for protection of receiving water beneficial uses. Therefore, a compliance schedule for compliance with the aluminum effluent limitations is established in the Order.

Interim performance-based maximum daily effluent limitations of 2200 µg/L for Discharge 001 and 6500 µg/L for Discharge 002 have been established in this Order. The interim limitations were determined as described in Attachment F, Section IV.E.1, and are in effect until 25 October 2017. As part of the compliance schedule, this Order requires the Discharger to submit a corrective action plan and implementation schedule to assure compliance with the final aluminum effluent limitations. In addition, the Discharger shall submit an engineering treatment feasibility study and prepare and implement a pollution prevention plan developed in accordance with CWC section 13263.3(d)(3). The Pollution Prevention Plan required herein is not incorporated by reference into this Order.

f. **Ammonia.** Untreated domestic wastewater contains ammonia. 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 does not currently use 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 would violate the Basin Plan narrative toxicity objective. Applying 40 CFR section122.44(d)(1)(vi)(B), it is appropriate to use USEPA's Ambient National Water Quality Criteria for the Protection of Freshwater Aquatic Life for ammonia, which was developed to be protective of aquatic organisms.

USEPA's *Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life*, for total ammonia, recommends acute (1-hour average; criteria maximum concentration or CMC) standards based on pH and chronic (30-day average, criteria continuous concentration or CCC) standards based on pH and temperature. It also recommends a maximum four-day average concentration of .2.5 times the criteria continuous concentration. USEPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. Salmonids were more sensitive to acute toxicity effects than other species. However, while the acute toxicity of ammonia was not influenced by temperature, it was found that invertebrates and young fish experienced increasing chronic toxicity effects with increasing temperature. Because the Yolo Bypass has a beneficial use of potential cold freshwater habitat and salmonids are known to be in the Yolo Bypass year-round, the recommended criteria for waters where salmonids and early life stages are present were used. USEPA's recommended criteria are show below:

$$CCC_{30-day} = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) \times MIN\left(2.85, 1.45 \cdot 10^{0.028(25-T)}\right), \text{ and}$$

$$CMC = \left(\frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}} \right),$$

where T is in degrees Celsius

The temperature of the effluent and receiving streams vary seasonally. As requested by the Discharger, this Order contains seasonal limitations for ammonia.

The maximum permitted effluent pH is 8.50. In order to protect against the worst-case short-term exposure of an organism, a pH value of 8.0 was used to derive the CMC. For Discharges 001 and 002, the resulting CMC is 5.62 mg/L.

Using effluent and receiving water data from 1 July 2006 to 31 July 2009, with data from 1 March 2006 to 31 October 2009 for dry season and 1 November 2006 to 29 February 2009 for wet season, the paired 30-day rolling average temperature and pH were used to calculate a CCC for the effluent and downstream receiving water for each day when temperature and pH were measured. The resulting lowest 99.9% 30-day average CCC for Discharges 001 and 002 are shown below.

	Ammonia, mg/L (as N)	
	Lowest 99.9% 30-day average CCC	
	Discharge 001	**Discharge 002**
1 Nov – 29 Feb	1.91	3.15
1 Mar – 31 Oct	1.27	1.61

~~The maximum observed rolling 30-day average temperature in Discharge 001 and the Willow Slough Bypass was 70.7ºF (21.5ºC) and 82ºF (27.8ºC), respectively from 1 March through 31 October and 60.6ºF (15.9ºC) and 70ºF (21.1ºC), respectively, from 1 November through 29 February. Using the maximum permitted (worst-case) pH of 8.5, and a worst-case temperature of 82ºF (27.8ºC) and 70ºF (21.1ºC) on a 30-day basis, the 30-day criteria are 0.46 mg/L from 1 March through 31 October and 0.71 mg/L from 1 November through 29 February. The 4-day criteria are 1.15 mg/L from 1 March through 31 October and 1.78 mg/L from 1 November through 29 February. The resulting average monthly ammonia effluent limitation for Discharge 001 is 0.43 mg/L from 1 March through 31 October and 0.52 mg/L from 1 November through 29 February.~~

Discharge 001 – The Regional 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 3-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 SIP procedures. This Order contains an AMEL and MDEL for ammonia of 1.6 mg/L and 3.8 mg/L (as N), respectively, based on the 30-day CCC, for the period from 1 March to 31 October and an AMEL and MDEL for ammonia of 2.2 mg/L and 3.3 mg/L (as N), respectively, based on the 30-day CCC, for the period from 1 November to 29 February.

Discharge 002 – The Regional 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 3-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 SIP procedures. This Order contains an AMEL and MDEL for ammonia of 2.1 mg/L and 4.8 mg/L (as N), respectively, based on the 30-day CCC, for the period from 1 March to 31 October and an AMEL and MDEL for ammonia of 2.9 mg/L and 5.6 mg/L (as N), respectively, based on the 30-day CCC, for the period from 1 November to 29 February.

~~The observed maximum pH in Willow Slough Bypass at R-1 was 8.9 and the observed maximum pH in the effluent was 8.1. Using a worst-case maximum pH of 8.9, the resulting maximum daily effluent limitation for Discharge 001 is 1.04 mg/L (as N).~~

~~The maximum observed rolling 30-day average temperature in Discharge 002 and the Conaway Ranch Toe Drain was 79ºF (26.3ºC) and 81ºF (27.2ºC), respectively from 1 March through 31 October and 66ºF (19ºC) and 69ºF (20.6ºC), respectively, from 1 November through 29 February. Using the maximum permitted (worst-case) pH of 8.5, and a worst-case temperature of 81ºF (27.2ºC) and 69ºF (20.6ºC) on a 30-day basis, the 30-day criteria are 0.48 mg/L from 1 March through 31 October and 0.74 mg/L from 1 November through 29 February. The 4-day criteria are 1.20 mg/L from 1 March through 31 October and 1.85 mg/L from 1 November through 29 February. The resulting average monthly ammonia effluent limitation for Discharge 002 is 0.46 mg/L from~~

~~1 March through 31 October and 0.67 mg/L from 1 November through 29 February.~~

~~The maximum effluent pH was 8.7 and the maximum pH in the Conaway Ranch Toe Drain was 8.3. Using a worst-case pH value of 8.7, the resulting maximum daily effluent ammonia limitation for Discharge 002 is 1.11 mg/L (as N) from 1 March through 31 October and 1.47 mg/L (as N) from 1 November through 29 February.~~ Effluent Limitations for ammonia are included in this Order to assure the treatment process adequately nitrifies the waste stream to protect the aquatic habitat beneficial uses.

Based on the sample results in the effluent, it appears that the Discharger may be in immediate non-compliance upon issuance of the permit. New or modified control measures may be necessary in order to comply with the effluent limitations, and the new or modified control measures cannot be designed, installed and put into operation within 30 calendar days. The Basin Plan for the Sacramento and San Joaquin River Basins includes a provision that authorizes the use of compliance schedules in NPDES permits for water quality objectives adopted after 25 September 1995 (See Basin Plan at page IV-16). The water quality-based effluent limitations for ammonia are based on a new interpretation of the narrative standard for protection of receiving water beneficial uses. Therefore, a compliance schedule for compliance with the ammonia effluent limitations is established in the Order.

Interim performance-based maximum daily effluent limitations of 20.5 µg/L for Discharge 001 and 13.2 for Discharge 002 have been established in this Order. The interim limitations were determined as described in Attachment F, Section IV.E.1., and are in effect until 25 October 2017. As part of the compliance schedule, this Order requires the Discharger to submit a corrective action plan and implementation schedule to assure compliance with the final ammonia effluent limitations. In addition, the Discharger shall submit an engineering treatment feasibility study.

g. **Bis (2-ethylhexyl) phthalate.** Bis (2-ethyl-hexyl) phthalate is used primarily as one of several plasticizers in polyvinyl chloride (PVC) resins for fabricating flexible vinyl products. According to the Consumer Product Safety Commission, USEPA, and the Food and Drug Administration, these PVC resins are used to manufacture many products, including soft squeeze toys, balls, raincoats, adhesives, polymeric coatings, components of paper and paperboard, defoaming agents, animal glue, surface lubricants, and other products that must stay flexible and noninjurious for the lifetime of their use. The NTR criterion for Human health protection for consumption of aquatic organisms only is 5.9 µg/l.

The observed maximum concentration in Discharge 001 for bis (2-ethylhexyl) phthalate was 40 µg/L, based on 21 samples collected between January 2002 and May 2005, while the maximum observed upstream receiving water bis (2-ethyl-hexyl) phthalate concentration was 9 µg/L, based on five samples collected between January 2002 and December 2002. The observed maximum

concentration in Discharge 002 for bis (2-ethyl-hexyl) phthalate was 59 µg/L, based on 20 samples collected between January 2002 and May 2005, while the maximum observed upstream receiving water bis (2-ethyl-hexyl) phthalate concentration was non-detect, based on four samples collected between April 2002 and July 2002. However, bis (2-ethylhexyl) phthalate grab samples showed all nondetected or J-flagged values for Discharge 001, with a maximum J-flag value of 2.8 ug/L, and were all nondetect for Discharge 002. Many of these grab samples were taken simultaneously with a composite sample showing results above the criteria. Composite sampling uses plastic tubing, which may contaminate the sample and result in erroneous data. Using the grab sampling data only, neither discharge has a reasonable potential to cause or contribute to an in stream excursion above the NTR criterion for bis (2-ethylhexyl)phthalate. The detention provided by the ponds at the WWTP equalizes short-term peaks in the data, such that grab sampling and composite sampling should be somewhat similar. Since the composite sampling may have contaminated the samples, concurrent grab sampling did not show values above the criteria, and the WWTP uses a pond system, this Order does not include an effluent limitation for bis (2-ethylhexyl) phthalate. This Order requires priority pollutant monitoring, including bis (2-ethylhexyl) phthalate grab samples, that will verify whether the concentration of bis (2-ethylhexyl) phthalate in the WWTP effluent remains below the criteria.

h. **Chlorine Residual.** The Discharger uses chlorine for disinfection, which is extremely toxic to aquatic organisms. The Discharger uses a sulfur dioxide process to dechlorinate the effluent prior to discharge to the Willow Slough Bypass and prior to discharge to the wetlands, which discharge to the Conaway Ranch Toe Drain. Due to the existing chlorine use and the potential for chlorine to be discharged, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective.

   The USEPA Technical Support Document for Water Quality-Based Toxics Control [EPA/505/2-90-001] contains statistical methods for converting chronic (four-day) and acute (one-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 one-hour limitation is considered more appropriate than an average daily limitation. Average one-hour and four-day limitations for chlorine, based on these criteria, are included in this Order. The Discharger can immediately comply with these new effluent limitations for chlorine residual.

i. **Copper.** The CTR includes hardness-dependant criteria for the protection of freshwater aquatic life for copper. The criteria for copper are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentration to total concentrations. The USEPA default conversion factors for copper in freshwater of 0.96 for both the acute and the chronic criteria were used for the discharge from EFF-002 to the Conaway Ranch Toe Drain. The Discharger submitted *Metals translator Monitoring Study – Copper, Lead*

and Nickel, dated January 2007, which proposed site-specific translators for copper based on the dissolved to total metal ratios in the effluent from Discharge 001 and in the Willow Slough Bypass. The site-specific metal translators based on the effluent from Discharge 001 have been used to convert water quality objectives from dissolved to total recoverable when developing effluent limitations for EFF-001 for copper (see Section IV.C.2.b of the Fact Sheet).

~~The observed maximum concentration for total copper in Discharge 001 was 13 µg/L, based on twenty-three samples collected between January 2002 and May 2005whilethe maximum observed upstream Willow Slough Bypass total copper concentration was 5.7 µg/L, based on five samples collected between January 2002 and December 2002. The observed maximum concentration for total copper in Discharge 002 was 16 µg/L, based on twenty-one samples collected between January 2002 and May 2005, while the maximum observed upstream Willow Slough Bypass total copper concentration was 13 µg/L, based on six samples collected between January 2002 and December 2002.~~

Discharge 001 - For the effluent, the applicable copper chronic criterion (maximum 4-day average concentration) is 35 µg/L and the applicable acute criterion (maximum (1-hour concentration) is 49 µg/L, as total recoverable, (see Table F-9, above). The MEC for total copper in Discharge 001 was 15 µg/L, based on thirty-two samples collected between July 2005 and November 2008. For the receiving water, the applicable copper chronic criterion is 13 µg/L and the applicable acute criterion is 16 µg/L, as total recoverable, based on a hardness of 78 mg/L (as $CaCO_3$), using USEPA default translators. The maximum observed upstream Willow Slough Bypass total copper concentration was 5.7 µg/L, based on five samples collected between January 2002 and December 2002. Based on this information, the discharge does not exhibit reasonable potential to cause or contribute to an in-stream excursion of the CTR criteria for copper.

Discharge 002 – For the effluent, the applicable copper chronic criterion is 21 µg/L and the applicable acute criterion is 34 µg/L, as total recoverable, based on a hardness of 260 mg/L (as $CaCO_3$). The MEC for total copper in Discharge 002 was 39 µg/L, based on twenty-three samples collected between May 2005 and May 2009. For the receiving water, the applicable copper chronic criterion is 8.1 µg/L and the applicable acute criterion is 12 µg/L, as total recoverable, based on a hardness of 85 mg/L (as $CaCO_3$). The maximum observed upstream Conaway Ranch Toe Drain total copper concentration was 13 µg/L, based on six samples collected between March 2002 and September 2002. Based on this information, the discharge exhibits reasonable potential to cause or contribute to an in-stream excursion of the CTR criteria for copper. No dilution is allowed since the discharge is to an ephemeral stream. Using the acute and chronic ECAs for copper shown in Table F-9, above, this Order contains final Average Monthly Effluent Limitations (AMEL) and Maximum Daily Effluent Limitations (MDEL) for copper of 16 µg/L and 34 µg/L (total recoverable), respectively.

~~Therefore, the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for copper using the~~

~~RPA dataset. However, more recent monitoring shows copper above the criteria in May 2006 and May 2007 in Discharge 002.~~

As explained in Attachment F, Sections VI.B.4 and VI.B.7, this Order requires annual monitoring of copper in Discharge 001 (as part of the priority pollutant monitoring) and monthly monitoring of copper in Discharge 002.

j. **Cyanide.** 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. The observed maximum concentration for cyanide in Discharge 001 was 6 µg/L, based on ten samples collected between January 2002 and May 2005. The observed maximum concentration for cyanide in Discharge 002 was 2.9 µg/L, based on twelve samples collected between January 2002 and May 2005. Therefore, Discharge 001 has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for cyanide. No dilution is allowed due to periods of no measurable flow in the receiving water. An AMEL and MDEL for cyanide of 3.8 µg/L and 9.5 µg/L, respectively, are included in this Order for Discharge 001 based on CTR criteria for the protection of freshwater aquatic life (See Attachment F, Tables F-5a and F-5b for WQBEL calculations).

The Discharger is unable to comply with these limitations. Section 2.1 of the SIP allows for compliance schedules within the permit for existing discharges where it is demonstrated that it is infeasible for a Discharger to achieve immediate compliance with a CTR criterion. Using the statistical methods for calculating interim effluent limitations described in Attachment F, Section IV.E.1., an interim performance-based maximum daily limitation of 9.6 µg/L was calculated for Discharge 001.

Section 2.1 of the SIP provides that: "*Based on an existing discharger's request and demonstration that it is infeasible for the discharger to achieve immediate compliance with a CTR criterion, or with an effluent limitation based on a CTR criterion, the RWQCB may establish a compliance schedule in an NPDES permit.*" Section 2.1, further states that compliance schedules may be included in NPDES permits provided that the following justification has been submitted: …"*(a) documentation that diligent efforts have been made to quantify pollutant levels in the discharge and the sources of the pollutant in the waste stream; (b) documentation of source control measures and/or pollution minimization measures efforts currently underway or completed; (c) a proposal for additional or future source control measures, pollutant minimization actions, or waste treatment (i.e., facility upgrades); and (d) a demonstration that the proposed schedule is as short as practicable*." The new water quality-based effluent limitations for cyanide become effective on **18 May 2010**.

This Order requires the Discharger to submit a corrective action plan and implementation schedule to assure compliance with the final cyanide effluent limitations. The interim effluent limitations are in effect through **17 May 2010**. As part of the compliance schedule for cyanide, the Discharger shall develop and

implement a pollution prevention program in compliance with CWC section 13263.3(d)(3) and submit an engineering treatment feasibility study.

The Discharger has indicated in their Infeasibility Report that additional time may be required beyond 17 May 2010 to comply with final effluent limits for cyanide. Based on the Discharger's performance in implementing their corrective action plan and implementation schedule, the Regional Water Board may consider at a future date issuance of a Time Schedule Order to provide additional time to comply with final effluent limits for cyanide.

k. **Electrical Conductivity. (see Subsection ~~q~~s. Salinity)**

l. **Iron.** The current USEPA Ambient Water Quality Criteria for Protection of Freshwater Aquatic Life is 1 mg/L for iron. The observed maximum concentration for iron in Discharge 001 was 1.3 mg/L, based on four samples collected between August 2002 and December 2002. The observed maximum concentration for iron in Discharge 002 was 4.6 mg/L, based on four samples collected between May 2002 and September 2002. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective. No dilution is allowed due to periods of no measurable flow in the receiving water. An AMEL and MDEL of 0.8 mg/L and 2 mg/L, respectively for iron for both discharges is included in this Order based on protection of the Basin Plan's narrative chemical constituents objective.

Based on the sample results in the effluent, it appears that the Discharger may be in immediate non-compliance upon issuance of the permit. New or modified control measures may be necessary in order to comply with the effluent limitations, and the new or modified control measures cannot be designed, installed and put into operation within 30 calendar days. The Basin Plan for the Sacramento and San Joaquin River Basins includes a provision that authorizes the use of compliance schedules in NPDES permits for water quality objectives adopted after 25 September 1995 (See Basin Plan at page IV-16). The water quality-based effluent limitations for iron are based on a new interpretation of the narrative standard for protection of receiving water beneficial uses. Therefore, a compliance schedule for compliance with the iron effluent limitations is established in the Order.

Interim performance-based maximum daily effluent limitations of 4.0 ug/L for Discharge 001 and 14 ug/L for Discharge 002 have been established in this Order. The interim limitations were determined as described in Attachment F, Section IV.E.1., and is in effect until 25 October 2017. As part of the compliance schedule, this Order requires the Discharger to submit a corrective action plan and implementation schedule to assure compliance with the final iron effluent limitations. In addition, the Discharger shall submit an engineering treatment feasibility study and prepare and implement a pollution prevention plan developed in accordance with CWC section 13263.3(d)(3). The Pollution Prevention Plan required herein is not incorporated by reference into this Order.

m. **Lead.** The CTR includes hardness-dependant criteria for the protection of freshwater aquatic life for lead. The criteria for lead are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentration to total concentrations. The USEPA default conversion factors for lead in freshwater were used for the discharge from EFF-002 to the Conaway Ranch Toe Drain. The Discharger submitted *Metals translator Monitoring Study – Copper, Lead and Nickel,* dated January 2007, which proposed site-specific translators for lead based on the dissolved to total metal ratios in the effluent from Discharge 001 and in the Willow Slough Bypass. The site-specific metal translators based on the effluent from Discharge 001 have been used to convert water quality objectives from dissolved to total recoverable when developing effluent limitations for EFF-001 for lead (see Section IV.C.2.b of the Fact Sheet).

Discharge 001 – For the effluent, the applicable lead chronic criterion (maximum 4-day average concentration) is 8.6 µg/L and the applicable acute criterion (maximum 1- hour concentration) is 134 µg/L, as total recoverable, (see Table F-9, above). The MEC for total lead in Discharge 001 was 0.62 µg/L, based on nine samples collected between August 2005 and November 2008. For the receiving water, the applicable lead chronic criterion is 3.0 µg/L and the applicable acute criterion is 61 µg/L, as total recoverable, based on the minimum observed receiving water hardness of 78 mg/L (as $CaCO_3$) and using USEPA's default translators. The maximum observed upstream Willow Slough Bypass total lead concentration was 0.29 µg/L based on one sample collected on 27 February 2002. Based on this information, the discharge does not exhibit reasonable potential to cause or contribute to an in-stream excursion of the CTR criteria for lead.

Discharge 002 – For the effluent, the applicable lead chronic criterion (maximum 4-day average concentration) is 9.4 µg/L and the applicable acute criterion (maximum 1- hour concentration) is 240 µg/L, as total recoverable, (see Table F-9, above). The MEC for total lead in Discharge 002 was 0.74 µg/L, based on six samples collected between May 2005 and March 2009. For the receiving water, the applicable lead chronic criterion is 2.6 µg/L and the applicable acute criterion is 66 µg/L, as total recoverable, based on the minimum observed receiving water hardness of 85 mg/L (as $CaCO_3$). The maximum observed upstream receiving water total lead concentration was 1.70 ug/L based on one sample collected on 7 May 2002. Based on this information, the discharge does not exhibit reasonable potential to cause or contribute to an in-stream excursion of the CTR criteria for lead.

n. **Manganese.** The recommended agricultural water quality goal for manganese, that would apply the narrative chemical constituent objective, is 200 mg/L as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (Ayers and Westcot 1985 Study). The observed maximum concentration for manganese for Discharge 001 was 740 µg/L, based on four samples collected between May 2002 and September 2002. The observed maximum concentration for manganese for Discharge 002 was 960 µg/L, based on four samples collected

between August 2002 and December 2002. The observed maximum concentration in both discharges exceeded the agricultural water quality screening value of 200 mg/L. No dilution is allowed due to periods of no measurable flow in the receiving water.

The Ayers and Westcot 1985 Study states, that manganese is "[t]oxic to a number of crops at a few-tenths to a few mg/l, but usually only in acid soils." This Order requires the Discharger to conduct site-specific studies to determine the appropriate manganese level to protect beneficial uses of the area. It is the intent of the Regional Water Board to include a final effluent limitation, if necessary, that is protective of manganese in a subsequent permit renewal or amendment, based on the results of approved site-specific studies.

o. **Mercury.** The Sacramento/San Joaquin Delta has been listed as an impaired water body pursuant to section 303(d) of the Clean Water Act because of mercury. Mercury bioaccumulates in fish tissue and, therefore, discharge of mercury to the receiving water is likely to contribute to exceedances of the narrative toxicity objective and impacts on beneficial uses. Because the receiving waters are tributary to the Sacramento/San Joaquin Delta, which has been listed as an impaired water body for mercury, the discharge must not cause or contribute to increased mercury levels. This Order contains a performance-based mass mercury Effluent Limitation of 0.038 lbs/month. This limitation is based on maintaining the mercury loading at the current level until a total maximum daily load (TMDL) can be established and USEPA develops mercury standards that are protective of human health. The mass limitation was derived using the maximum observed effluent mercury concentration and the reported average daily effluent flow rate. Compliance time schedules have not been included since the discharge currently meets the concentration based limitation and the mass limitation can be met through implementation measures and/or by limiting new sewer discharges containing mercury concentrations. If USEPA develops new water quality standards for mercury, this permit may be reopened and the Effluent Limitations adjusted.

p. **Nickel.** The CTR includes hardness-dependant criteria for the protection of freshwater aquatic life for nickel. The criteria for nickel are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentration to total concentrations. The USEPA default conversion factors for nickel in freshwater of 0.998 and 0.997 for acute and the chronic criteria, respectively, were used for the discharge from EFF-002 to the Conaway Ranch Toe Drain. The Discharger submitted *Metals translator Monitoring Study – Copper, Lead and Nickel,* dated January 2007, which proposed site-specific translators for nickel based on the dissolved to total metal ratios in the effluent from Discharge 001 and in the Willow Slough Bypass. The site-specific metal translators based on the effluent from Discharge 001 have been used to convert water quality objectives from dissolved to total recoverable when developing effluent limitations for EFF-001 for nickel (see Section IV.C.2.b of the Fact Sheet).

Discharge 001 - For the effluent, the applicable nickel chronic criterion (maximum 4-day average concentration) is 160 µg/L and the applicable acute criterion (maximum 1-hour concentration) is 1300 µg/L (see Table F-9, above). The MEC for nickel in Discharge 001 was 27 µg/L, based on nine samples collected between August 2005 and November 2008. For the receiving water, the applicable nickel chronic criterion is 59 µg/L and the applicable acute criterion is 487 µg/L, as total recoverable, based on the minimum observed receiving water hardness of 78 mg/L (as $CaCO_3$) and using USEPA's default translators. The maximum observed Willow Slough Bypass total nickel concentration was 14 µg/L based on six samples collected between January 2002 and December 2002. Therefore, the discharge does not exhibit reasonable potential to cause or contribute to an in-stream excursion of the CTR criteria for nickel.

Discharge 002 – For the effluent, the applicable chronic nickel criterion is 120 µg/L and the applicable acute criterion is 1100 µg/L (see Table F-9, above). The MEC for nickel in Discharge 002 was 33 µg/L, based on six samples collected between May 2005 and March 2009. For the receiving water, the applicable nickel chronic criterion is 46 µg/L and the applicable acute criterion is 410 µg/L, based on the minimum receiving water hardness of 78 mg/L (as $CaCO_3$). The maximum observed Conaway Ranch Toe Drain nickel concentration was 3 µg/L based on six samples collected between March 2002 and September 2002. Therefore, the discharge does not exhibit reasonable potential to cause or contribute to an in-stream excursion of the CTR criteria for nickel.

q. **Pathogens**. The designated beneficial uses of the Yolo Bypass include water contact recreation and agricultural irrigation supply. The City of Woodland's *December 2000 - Recreation, Land Use, and Dilution Study of the Tule Canal and Toe Drain* (Study) indicates that the Yolo Bypass has been used for water contact recreation, including fishing (with human consumption of fish) and swimming. Additionally, the Willow Slough Bypass and Conaway Ranch Toe Drain are used for duck hunting, and the wetlands at the WWTP are open to the public and used as an educational facility for schoolchildren. The Study indicates that crops grown in the area with the potential to be irrigated with Yolo Bypass waters include food crops that require irrigation water be treated to a tertiary level to protect the public health. The State of California Department of Water Resources 1997 Yolo County Land Use Survey shows tomatoes and either melons, squash, or cucumbers grown in the Yolo Bypass within the vicinity of the City's discharge. These crops require irrigation water be treated to a tertiary level to protect public health.

The California Department of Health Services (DHS) 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 m*l* as a 7-day median. Title 22 is not directly applicable to surface waters; however, the Regional Water Board finds

that it is appropriate to apply an equivalent level of treatment to that required by DHS's reclamation criteria because the receiving water is used for irrigation of agricultural land and for contact recreation purposes. To protect public health, DHS recommends that discharges to receiving streams with contact recreation and less than 20:1 dilution be oxidized, coagulated, filtered and adequately disinfected to provide a median total coliform organisms concentration of 2.2 MPN/100 mL at some point in the treatment process. The stringent disinfection criteria of Title 22 are appropriate since the receiving waters, at times, do not provide a 20:1 receiving water to effluent dilution ratio.

To protect the beneficial uses, the Regional Water Board finds that the wastewater must be disinfected and adequately treated to prevent disease. The principal infectious agents (pathogens) that may be present in raw sewage may be classified into three broad groups: bacteria, parasites, and viruses. Tertiary treatment, consisting of chemical coagulation, sedimentation, and filtration, has been found to remove approximately 99.5% of viruses. Filtration is an effective means of reducing viruses and parasites from the waste stream. The wastewater must be treated to tertiary standards (filtered), or equivalent, to protect contact recreational and food crop irrigation uses.

Coliform organisms are intended as an indicator of the effectiveness of the entire treatment train and the effectiveness of removing other pathogens. As coliform organisms are living and mobile, it is impracticable to quantify an exact number of coliform organisms and to establish weekly average limitations. Instead, coliform organisms are measured as a most probable number and regulated based on a 7-day median limitation. The method of treatment is not prescribed by this Order; however, wastewater must be treated to a level equivalent to that recommended by DHS.

In addition to coliform testing, a turbidity effluent limitation has been included as a second indicator of the effectiveness of the treatment process and to assure compliance with the required level of treatment. The tertiary treatment process, or equivalent, is capable of reliably meeting a turbidity limitation 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, allowing immediate detection of filter failure and rapid corrective action. 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 DHS recommended Title 22 disinfection criteria, weekly average effluent limitations are impracticable for turbidity.

This Order contains effluent limitations and a tertiary level of treatment, or equivalent, necessary to protect the beneficial uses of the receiving water. In accordance with CWC section 13241, the Regional Water Board has considered the following:

i. The past, present and probable future beneficial uses of the receiving stream include agricultural irrigation, agricultural stock watering, body contact water recreation, other non-body contact water recreation, warm freshwater aquatic habitat, potential cold freshwater aquatic habitat, warm fish migration habitat, cold fish migration habitat, warm spawning habitat, and wildlife habitat.

ii. The environmental characteristics of the hydrographic unit, including the quality of the available water, will be improved by the requirement to provide tertiary treatment for this wastewater discharge. The water quality in the Yolo Bypass includes tertiary-treated water from the City of Woodland WWTP. Tertiary treatment will allow for the reuse of the undiluted wastewater for food crop irrigation and contact recreation activities that would otherwise be unsafe according to recommendations from the California Department of Health Services (DHS).

iii. Fishable and swimmable water quality conditions can be reasonably achieved through the coordinated control of all factors that affect water quality in the area.

iv. The economic impact of requiring an increased level of treatment has been considered. The Discharger estimates the cost to upgrade the WWTP to tertiary or equivalent to be $140 million dollars. Much of this cost is for upgrades necessary to comply with the mandatory California Toxics Rule (CTR) limitations. The Wastewater User Charge Survey Reports, prepared by the State Board, show the City's monthly user charges prior to fiscal year 2006-2007 have been lower than the State monthly average, but recently the charges have increased in anticipation of the requirement to upgrade the WWTP. Effective the summer of 2007, the City has a monthly user charge of $39.00, which covers the existing operation and management of the WWTP and preliminary design and planning for WWTP upgrades.

    The loss of beneficial uses within downstream waters, without the tertiary treatment requirement, which could include prohibiting the irrigation of food crops and prohibiting public access for contact recreational purposes, would have a detrimental economic impact. In addition to pathogen removal to protect irrigation and recreation, tertiary treatment may also aid in meeting discharge limitations for other pollutants, such as heavy metals, reducing the need for advanced treatment specific for those pollutants.

v. The need for developing housing in the area has been considered. The Discharger is not requesting the WWTP be permitted to discharge an increased flow, which indicates the City does not anticipate needing additional treatment plant capacity to accommodate housing development within the next five years. However, any housing development in the area may be facilitated by improved water quality, which protects the contact recreation and irrigation uses of the receiving water. Any growth in the area will place

greater demand on the available resources and will increase the potential for activities, such as contact recreation, that needs an improved surface water quality.

vi. It is the Regional Water Board's policy, (Basin Plan, page IV-12.00, Policy 2) to encourage the reuse of wastewater. The Regional Water Board requires dischargers to evaluate how reuse or land disposal of wastewater can be optimized. The need to develop and use recycled water is facilitated by providing a tertiary level of wastewater treatment that will allow for a greater variety of uses in accordance with CCR, Title 22. DHS recommends that, in order to protect the public health, relatively undiluted wastewater effluent must be treated to a tertiary level for contact recreational and food crop irrigation uses. Without tertiary treatment, the downstream waters could not be safely utilized for contact recreation or the irrigation of food crops.

Title 22 contains reclamation criteria for the reuse of wastewater, and requires recycled water be disinfected and treated to a tertiary level when used to irrigate food crops where the recycled water may come into contact with the edible portion of the crop. Tertiary treatment will allow for the continued reuse of the undiluted wastewater for food crop irrigation and contact recreation activities, which is otherwise unsafe according to recommendations from the DHS. These crops require irrigation water be treated to a tertiary level to protect public health.

vii. The Regional Water Board has considered the factors specified in CWC section 13263, including considering the provisions in CWC section 13241, in adopting the disinfection and filtration requirements under Title 22 criteria. The Regional Water Board finds, on balance, that these requirements are necessary to protect the beneficial uses of the Yolo Bypass, including water contact recreation and irrigation uses.

The establishment of tertiary limitations has not been previously required for this discharge; therefore, a schedule for compliance with the tertiary treatment requirements is included in Special Provisions VI.C.7.a. of this Order. This Order provides interim effluent limitations for BOD, TSS, and total coliform, which the Discharger is currently capable of meeting. Full compliance with the final effluent limitations for BOD, TSS, total coliform, and turbidity are not required by this Order until 25 October 2017.

r. **pH.** 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. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses.*"

Order R5-2007-0132-01 contains instantaneous minimum and maximum pH effluent limitations of 6.5 and 8.5, respectively, based on the Basin Plan objectives for pH. The Discharger is upgrading the Facility to tertiary and year-round nitrification/denitrification and has requested a more stringent

instantaneous maximum pH of 8.0 to allow less stringent ammonia limits, which are based on pH-dependent ammonia criteria. For Discharge 001 (non-wetlands treatment), the instantaneous maximum pH was 8.06 and averaged 7.51, based on 1,582 samples collected between 1 June 2001 and 31 July 2009. For Discharge 002 (wetlands treatment), the instantaneous maximum pH was 8.7 and averaged 7.79, based on 1,118 samples collected between 1 July 2001 and 24 June 2009. Based on pH effluent data for Discharge 001, which does not include wetlands treatment that can elevate pH, it appears the discharge can consistently comply with a more stringent instantaneous maximum pH limit. The Discharger's proposed facility upgrades include more conventional treatment methods that will allow more consistent control for pH. Therefore, it is reasonable to require the more stringent instantaneous maximum pH limit of 8.0 and allow corresponding less stringent ammonia effluent limits. This allows the Discharger to design treatment facilities for ammonia removal based on the expected effluent quality of more conventional treatment systems typically used for nitrification/denitrification (e.g., activated sludge).

Instantaneous minimum and maximum effluent limitations for pH of 6.5 and 8.0, respectively, are included in this Order based on the Basin Plan objectives for pH and the capability of the future treatment system to control pH.

Based on the samples in the effluent, it appears the Discharger may be in non-compliance upon issuance of the permit. New or modified controls measures may be necessary in order to comply with the effluent limitations, and the new or modified control measures cannot be designed, installed, and put into operation within 30 calendar days. The current treatment system either discharges directly to Willow Slough Bypass (Discharge 001) or through a wetland system into Conaway Ranch Toe Drain (Discharge 002) depending on the season. This system cannot meet the final effluent limitations therefore, an interim pH of 8.5 for Discharge 001 and Discharge 002 are established in this Order

s. **Salinity.** The discharge contains total dissolved solids (TDS), chloride, sodium, boron, and electrical conductivity (EC). These are water quality parameters that are indicative of the salinity of the water. Their presence in water can be growth limiting to certain agricultural crops and can affect the taste of water for human consumption. There are no USEPA water quality criteria for the protection of aquatic organisms for these constituents. The Basin Plan contains a narrative water quality objective for EC, TDS, boron, sodium, and chloride.

Table F-510. Salinity Water Quality Goals[1]

Parameter	Agricultural WQ Goal[2]	Effluent –Discharge 001		Effluent –Discharge 002	
		Average	Maximum	Average	Maximum
EC (µmhos/cm)	varies[3]	1871	3688	1991	3273
TDS (mg/L)	varies[3]	1062	1300	1155	1512
Boron (mg/L)	varies[3]	1800	1800	2150	2400
Chloride (mg/L)	varies[3]	260	270	290	330
Sodium (mg/L)	varies[3]	200	200	250	250

1. Secondary maximum contaminant levels (MCLs) are not applicable for this discharge because the Yolo Bypass is not designated as having a MUN beneficial use.
2. Agricultural water quality goals based on *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1, R.S. Ayers and D.W. Westcot, Rome, 1985 (Ayers and Westcot, 1985 Study).
3. The EC level in irrigation water that harms crop production depends on the crop type, soil type, irrigation methods, rainfall, and other factors. An EC level of 700 umhos/cm is generally considered to present no risk of salinity impacts to crops. However, many crops are grown successfully with higher salinities.

i. **Boron.** The recommended agricultural water quality goal for boron is 700 mg/L as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (Ayers and Westcot 1985 Study). In addition to the mineral elements N, P, K, S, Ca, and Mg, defined as macronutrients, plants require other mineral elements, which are generally described as micronutrients; due to the relatively small amounts required.

The Discharger has not historically monitored its effluent for boron. Thus, there is limited effluent data for boron. Effluent data from 2005 indicates that boron was detected in Discharge 001 at a maximum concentration of 1800 µg/l. Effluent data from 2006 and 2007 showed boron ranged from 1300 ug/l to 2400 ug/l with an average concentration of 1870 ug/l. The agricultural water quality screening value for boron is 700 µg/l. The observed maximum concentration of boron in both discharges exceeded the agricultural water quality screening value.

This Order requires the Discharger to conduct site-specific studies to determine the appropriate boron level to protect beneficial uses. It is the intent of the Regional Water Board to include a final effluent limitation that is protective of boron in a subsequent permit renewal or amendment, based on the results of approved site-specific studies.

ii. **Chloride.** The recommended agricultural water quality goal for chloride is 106 mg/L as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (Ayers and Westcot 1985 Study). The

106 mg/L water quality goal is intended to protect against adverse effects on sensitive crops when irrigated via sprinklers.

At Discharge 001, chloride concentrations ranged from 250 mg/L to 270 mg/L, with an average of 260 mg/L, for four samples collected by the Discharger from August 2002 through December 2002. Background concentrations in Willow Slough Bypass ranged from 28 mg/L to 190 mg/L, with an average of 90 mg/L, for five samples collected by the Discharger from January 2002 through December 2002. At Discharge 002, chloride concentrations ranged from 330 mg/L to 230 mg/L, with an average of 285 mg/L, for four samples collected by the Discharger from May 2002 through September 2002. Background concentrations in Conaway Ranch Toe Drain ranged from 27 mg/L to 70 mg/L, with an average of 45 mg/L, for five samples collected by the Discharger from March 2002 through September 2002. The observed maximum concentration in both discharges exceeded the agricultural water quality screening value of 106 mg/L. The chloride data indicates that effluent chloride may correlate with effluent EC levels.

This Order requires the Discharger to conduct site-specific studies to determine the appropriate chloride level to protect beneficial uses. It is the intent of the Regional Water Board to include a final effluent limitation that is protective of chloride in a subsequent permit renewal or amendment, based on the results of approved site-specific studies.

iii. **Electrical Conductivity (EC).** *The Basin Plan designates agriculture as a beneficial use of the Yolo Bypass.* The Basin Plan states, "Waters shall not contain constituents in concentrations that adversely affect beneficial uses." The Basin Plan's "Policy for Application of Water Quality Objectives" provides that in implementing narrative water quality objectives, the Regional Water Board will consider numerical criteria and guidelines developed by other agencies and organizations. This application of the Basin Plan is consistent with Federal Regulations, 40 CFR 122.44(d). The agricultural water quality goal, that would fully protect the agricultural beneficial use, is 700 µmhos/cm as a long-term average based on the Ayers and Westcot 1985 Study. Water Quality for Agriculture evaluates the impacts of salinity levels on crop tolerance and yield reduction, and establishes water quality goals that are protective of the agricultural uses. The 700 µmhos/cm agricultural water quality goal is intended to prevent reduction in crop yield and to prevent restriction on use of water for salt-sensitive crops, such as beans, carrots, turnips, and strawberries. These crops are either currently grown in the area or may be grown in the future. Most other crops can tolerate higher EC concentrations without harm, however, as the salinity of the irrigation water increases, more crops are potentially harmed by the EC, or extra measures must be taken by the farmer to minimize or eliminate any harmful impacts. The United Nations report indicates that site-specific factors, such as rainfall and flooding, should be considered in determining protective EC levels in irrigation water. Significant flooding occurs in the Yolo Bypass, which could affect EC requirements for irrigation waters used in the bypass.

At Discharge 001, EC ranged from 903 µmhos/cm to 2546 µmhos/cm, with an average of 1885 µmhos/cm for 542 samples collected from May 2002 through May 2005. These levels exceed the agricultural screening value. The background receiving water EC averaged 852 µmhos/cm in 95 sampling events collected by the Discharger (R-1 data) from May 2002 through May 2005. At Discharge 002, EC ranged from 3273 µmhos/cm to 612 µmhos/cm, with an average of 1967 µmhos/cm for 497 samples collected from May 2002 through May 2005. These levels exceed the agricultural screening value. The background receiving water EC averaged 855 µmhos/cm in 41 sampling events collected by the Discharger (R-3 data) from May 2002 through May 2005. No dilution is allowed due to periods of no measurable flow in the receiving stream.

The City's water supply comes from groundwater wells, with a weighted average electrical conductivity of approximately 950 umhos/cm. As the source water is above the secondary MCL for drinking water, the use of water softeners further increases the WWTP's influent EC. From May 2002 through May 2005, influent EC averaged 2190 umhos/cm, and ranged from 1460 to 4120 umhos/cm. The Discharger anticipates that the most cost effective method for lowering the level of electrical conductivity in the WWTP effluent is to obtain new municipal water supplies by using groundwater contained in the deep aquifer and/or by obtaining surface water supplies. The Discharger's consideration of projects to improve the quality of the water supply is a longer-term plan that would, if approved, be completed sometime between 2015 and 2020.

To protect the receiving water from further salinity degradation, an interim performance-based annual average EC effluent limitation of 2050 umhos/cm for both discharges is included in this Order. The interim limitation was determined as described in Attachment F, Section IV.E.1. This Order requires the Discharger to conduct site-specific studies to determine the appropriate EC level to protect beneficial uses. It is the intent of the Regional Water Board to include a final EC effluent limitation in a subsequent permit renewal or amendment, based on the results of approved site-specific studies.

State Water Board Order No. WQO 2008-0008 (City of Davis) concluded that the EC interim limitation was appropriate, but remanded the permit to the Regional Water Board to allow the Discharger use the results from the City of Woodland's EC site-specific study, in lieu of conducting a new study. The study provision has been modified to make this change.

iv. **Sodium.** The recommended agricultural water quality goal for sodium is 69 mg/L as a long-term average based on the Ayers and Westcot 1985 Study

At Discharge 001, a March 2001 sample had a sodium concentration of 200 mg/L. At Discharge 002, two samples collected July 2001 and October 2001 each had sodium concentrations of 250 mg/L. Background concentrations for sodium were not available for either receiving stream. The observed maximum concentration in both discharges exceeded the agricultural water quality screening value of 69 mg/L. There is insufficient sodium data to demonstrate whether sodium concentrations correlate with EC levels.

This Order requires the Discharger to conduct site-specific studies to determine the appropriate sodium level to protect beneficial uses. It is the intent of the Regional Water Board to include a final effluent limitation that is protective of sodium in a subsequent permit renewal or amendment, based on the results of approved site-specific studies.

v. **Total Dissolved Solids (TDS).** The recommended agricultural water quality goal for TDS is 450 mg/L as a long-term average based on the Ayers and Westcot 1985 Study. The 450 mg/L water quality goal is intended to prevent reduction in crop yield, i.e. a restriction on use of water, for salt-sensitive crops. Only the most salt sensitive crops require irrigation water of 450 mg/L or less to prevent loss of yield. Most other crops can tolerate higher TDS concentrations without harm, however, as the salinity of the irrigation water increases, more crops are potentially harmed by the TDS, or extra measures must be taken by the farmer to minimize or eliminate any harmful impacts.

At Discharge 001, the average TDS effluent concentration was 1062 mg/L and ranged from 1300 mg/L to 755 mg/L for 21 samples collected by the Discharger from May 2002 through May 2005. These concentrations exceed the applicable water quality screening values. The background receiving water (Willow Slough Bypass) TDS ranged from 330 mg/L to 960 mg/L, with an average of 650 mg/L in six sampling events performed by the Discharger from January 2002 through December 2002. At Discharge 002, the average TDS effluent concentration was 1155 mg/L and ranged from 660 mg/L to1512 mg/L for 16 samples collected by the Discharger from May 2002 through May 2005. These concentrations exceed the applicable water quality screening values. The background receiving water TDS (Conaway Ranch Toe Drain) ranged from 300 mg/L to 690 mg/L, with an average of 500 mg/L in six sampling events performed by the Discharger from March 2002 through September 2002.

The TDS effluent concentration varied with the level of EC in the effluent, at a ratio of approximately 60 percent. Additionally, a comparison of each effluent TDS datum to the corresponding EC datum demonstrated that the percent reduction in EC necessary to achieve 700 umhos/cm was greater than the percent reduction in TDS necessary to achieve 450 mg/L. Since the TDS is directly related to the EC, this Order contains an interim effluent limitation for EC instead of TDS. Using EC instead of TDS to measure salinity is more cost-effective and allows continuous monitoring.

t. **Selenium.** Exposure to high doses of selenium can be toxic. The most frequently reported symptoms of selenosis (chronic selenium toxicity) are hair and nail brittleness and loss. Other symptoms may include gastrointestinal disturbances, skin rashes, a garlic breath odor, fatigue, irritability, and nervous system abnormalities.

The January 2002 through May 2005 effluent monitoring data reports indicates that selenium was detected in all the effluent samples. Detected concentrations of selenium ranged from 1.2 µg/l to 5.6 µg/l in Discharge 001 and 1 ug/l to 4 ug/l in Discharge 002. Using the Discharger's monitoring from 2002, the maximum observed concentrations of selenium in the Willow Slough Bypass and Conaway Ranch Toe Drain were 25 ug/l and 12 ug/l, respectively. The agricultural water quality screening value for selenium is 20 µg/l. USEPA established CTR criteria for the protection of freshwater aquatic life for selenium. The continuous concentration (four-day average) and the maximum concentration (one-hour average) criteria for selenium are 5.0 ug/l and 20 ug/l, respectively. The maximum detected concentration of selenium in Discharge 001 exceeds the water quality criteria. The maximum concentration of selenium in the Conaway Ranch Toe Drain exceeds the water quality criteria and selenium was detected in Discharge 002. Therefore, an effluent limitation for selenium is included in this Order for both discharges.

Based on the sample results in the effluent, it appears that the Discharger may be in immediate non-compliance upon issuance of the permit. New or modified control measures may be necessary in order to comply with the effluent limitations, and the new or modified control measures cannot be designed, installed and put into operation within 30 calendar days. The Basin Plan for the Sacramento and San Joaquin River Basins includes a provision that authorizes the use of compliance schedules in NPDES permits for water quality objectives adopted after 25 September 1995 (See Basin Plan at page IV-16). Order No. 5-01-067 included a weekly selenium limitation based off the same selenium criteria. However, the selenium limitation in Order No. 5-01-067 used the 4-day average criteria as the weekly average limit. Since this Order contains selenium limitations based on the statistical conversion of the 4-day average criteria to daily and monthly limitations, the effluent limitations in this Order are more stringent. Therefore, a compliance schedule for compliance with the selenium effluent limitations is established in the Order.

Interim performance-based maximum daily effluent limitations of 7.1 ug/L for Discharge 001 and 7.2 ug/L for Discharge 002 have been established in this Order. The interim limitations were determined as described in Section IV.E.1., and are in effect through 17 May 2010. As part of the compliance schedule, this Order requires the Discharger to submit a corrective action plan and implementation schedule to assure compliance with the final selenium effluent limitations. In addition, the Discharger shall submit an engineering treatment feasibility study and prepare and implement a pollution prevention plan

developed in accordance with CWC section 13263.3(d)(3). The Pollution Prevention Plan required herein is not incorporated by reference into this Order.

As part of its WWTP upgrade, the City of Davis plans to remove its overland flow system. Removal of the overland flow system should improve effluent quality for other constituents, but may cause effluent selenium concentrations to increase. The City anticipates that the new tertiary WWTP will not be able to remove selenium to the same degree as the existing equivalent to secondary WWTP. In the short term, this Order's interim selenium effluent limitations may need to be adjusted for the new WWTP. In the long term, the City is investigating options to meet final selenium effluent limitations with source control instead of treatment.

The source of selenium in the Discharger's influent is primarily due to the high levels of selenium contained in the municipal water supply. The municipal water supply for the City of Davis is primarily from groundwater sources. The Discharger anticipates that the most cost effective method for lowering the level of selenium in the Discharger's effluent is to obtain new municipal water supplies by using groundwater contained in the deep aquifer and/or by obtaining surface water supplies. The Discharger's consideration of projects to improve the quality of the water supply is a longer-term plan that would be completed sometime between 2015 and 2020.

The Discharger has indicated in the 30 January 2007 supplement to the Infeasibility Report that additional time may be required beyond 18 May 2010 to comply with final effluent limits for selenium. Based on the Discharger's performance in implementing their corrective action plan and implementation schedule to obtain new municipal water supplies, the Regional Water Board may consider at a future date issuance of a Time Schedule Order to provide additional time to comply with final effluent limits for selenium.

u. **Settleable Solids.** For inland surface waters, the Basin Plan states that "[w]ater shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses." This Order contains average monthly and average daily effluent limitations for settleable solids.

Because the amount of settleable solids is measured in terms of volume per volume without a mass component, it is impracticable to calculate mass limitations for inclusion in this Order. A daily maximum effluent limitation for settleable solids is included in the Order, in lieu of a weekly average, to ensure that the treatment works operate in accordance with design capabilities.

v. **Silver.** The CTR includes hardness-dependant criteria for the protection of freshwater aquatic life for silver. The criteria for metals are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The USEPA default conversion factors for silver in freshwater for acute criteria is 0.85.

Discharge 001 – For the effluent, the applicable silver acute criterion (maximum 1-hour concentration) is 13 µg/L (see table F-9, above). The MEC for silver in Discharge 001 was 0.09 µg/L, based on nine samples collected between August 2005 and November 2008. For the receiving water, the applicable silver acute criterion is 2.6 µg/L, based on the minimum observed receiving water hardness of 78 mg/L (as $CaCO_3$). The maximum observed upstream Willow Slough Bypass silver concentration was not detected (method detection limit of 0.2 µg/L), based on one sample collected on 27 February 2002. Based on this information, the discharge does not exhibit reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for silver.

Discharge 002 – For the effluent, the applicable silver acute criterion (maximum 1-hour concentration) is 14 µg/L (see table F-9, above). The MEC for silver in Discharge 002 was 4.2 µg/L, based on six samples collected between May 2005 and March 2009. For the receiving water, the applicable silver acute criterion is 3.1 µg/L, based on minimum observed receiving water hardness of 85 mg/L (as $CaCO_3$). The maximum observed receiving water silver concentration was 0.03 µg/L, based on one sample collected on 7 May 2002. Based on this information, the discharge does not exhibit reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for silver.

w. **Sodium.** (see Subsection ~~q~~s. Salinity)

x. **Zinc.** The CTR includes hardness-dependant criteria for the protection of freshwater aquatic life for zinc. The criteria for zinc are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The USEPA default conversion factors for zinc in freshwater for acute and chronic criteria is 0.978 and 0.986, respectively.

Discharge 001 - For the effluent, the applicable zinc acute and chronic criterion are 270 µg/L (see table F-9, above). The MEC for zinc in Discharge 001 was 24 µg/L, based on ten samples collected between August 2005 and November 2008. For the receiving water, the applicable zinc acute and chronic criteria is 97 µg/L based on the minimum observed receiving water hardness of 78 mg/L (as $CaCO_3$). The maximum observed upstream Willow Slough Bypass total zinc concentration was 3 µg/L based on one sample collected on 27 February 2002. Therefore, the discharge does not exhibit reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for zinc.

Discharge 002 - For the effluent, the applicable zinc acute and chronic criteria are 270 µg/L (see table F-9, above). The MEC for zinc in Discharge 002 was 41 µg/L, based on six samples collected between May 2005 and March 2009. For the receiving water, the applicable zinc acute and chronic criteria are 100 µg/L based on the minimum observed receiving water hardness of 85 mg/L (as $CaCO_3$). The maximum observed receiving water zinc concentration was 16 µg/L, based on one sample collected on 7 May 2002. Therefore, the discharge does not exhibit reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for zinc.

~~w.~~y. **2,3,7,8-TCDD and Congeners.** The CTR includes a criterion for 2,3,7,8-TCDD of 0.014 pg/L for the protection of human health based on ingestion of organisms only. The CTR does not include criteria for other dioxin congeners and there are no formally promulgated numeric water quality criteria for the other dioxin congeners. Therefore, determination of reasonable potential and effluent limitations, when appropriate, would be based on an interpretation of the Basin Plan narrative toxicity standard.

Dioxins occur as a large number of different isomers (congeners). In addition to 2,3,7,8-TCDD, there are many congeners of chlorinated dibenzodioxins (2,3,7,8-CDDs) and chlorinated dibenzofurans (2,3,7,8-CDFs) that exhibit toxic effects similar to those of 2,3,7,8-TCDD. Since human exposure to dioxins occurs as a complex mixture of these congeners, a methodology referred to as the Toxic Equivalency Factor (TEF) was developed to assess the health risks posed by mixtures of these compounds. The TEF methodology is a relative potency scheme that ranks the dioxin-like toxicity of a particular congener relative to 2,3,7,8-TCDD, which is the most potent congener. The TEF scheme used for inland surface waters, enclosed bays, and estuaries of California is provided in Section 3 of the SIP.

The SIP is the statewide, adopted Policy that Regional Water Boards must follow for implementing the CTR. In regards to 2,3,7.8-TCDD and its congeners the SIP reads:

> *"Whether or not an effluent limitation is required for 2,3,7,8-TCDD in accordance with Section 1.3 of the Policy, each RWQCB shall require (as described below) major and minor POTW and industrial dischargers in its region to conduct effluent monitoring for the 2,3,7,8-TCDD congeners listed above. The purpose of the monitoring is to assess the presence and amounts of the congeners being discharged to inland surface waters, enclosed bays, and estuaries for the development of a strategy to control these chemicals in a future multi-media approach."*

To date, the multi-media control strategy referenced in the SIP has not been developed. The introduction to the SIP states, in part, that the Policy establishes monitoring requirements for 2,3,7,8-TCDD equivalents. The SIP does not explicitly direct the Regional Water Boards to establish effluent limits when dioxin congeners are detected in the effluent. Rather it directs the discharger to report the data and in its report to multiply each measured or estimated congener concentration by its respective TEF value (described above) and report the sum of these values to the Regional Water Board. The SIP further states:

> *"Based on the monitoring results, the RWQCB may, at its discretion, increase the monitoring requirement (e.g., increase sampling frequency) to further investigate frequent or significant detections of any congener. At the conclusion of the three-year monitoring period, the SWRCB and RWQCBs will assess the data (a total of six samples each from major POTWs and*

industrial dischargers, and a total of two samples each from minor POTWs and industrial dischargers), and determine whether further monitoring is necessary."

The Discharger has been performing dioxin and furan congeners monitoring of the Facility effluent since April 1994. 2,3,7,8-TCDD was not detected in any of the samples collected in the Facility effluent. In the effluent, two of the congeners (1,2,3,4,6,7,8-HeptaCDD and OCDD) were reported as individually detected from May 2002 through May 2005 in both Discharge 001 and Discharge 002. Additionally, total HpCDD, total HxCDF, and total PeCDF were detected in both Discharge 001 and Discharge 002, total TCDF and total TCDD were detected in Discharge 001, and total HxCDD was detected in Discharge 002. However, of the detected values of 1,2,3,4,6,7,8-HeptaCDD, all were estimated values (i.e., j-flagged) and all but one of the detected values of OCDD were estimated values.

The Discharger performed a Dioxin Study from 1994 to1999 after US EPA monitoring detected dioxin-like congeners in the WWTP sludge. The Study found concentrations of 2,3,7,8-CDDs and 2,3,7,8-CDFs in the WWTP sludge and attributed waste haulers as one possible source. The Study stated that dioxins are "ubiquitous" in the environment and noted that out of ten effluent samples, only one effluent sample showed 2,3,7,8-CDDs and 2,3,7,8-CDFs.

Based on the limited data available, the lack of formally promulgated water quality criteria for congeners other than 2,3,7,8-TCDD, the fact that the Willow Slough Bypass, Conaway Ranch Toe Drain, and Yolo Bypass are not listed as impaired for dioxins and furans, and because the multi-media control strategy discussed in the SIP has not been developed, it is not appropriate to establish effluent limitations for other dioxin congeners at this time.

Due to the concerns of the potential impacts of dioxins and furans on the receiving water and in compliance with the SIP, this Order requires quarterly monitoring of dioxin and congeners for eight consecutive quarters following the effective date of this Order, then annual monitoring for the remainder of the effective term of this Order. This Order additionally includes a reopener to allow the Regional Water Board to consider adding effluent limits for dioxin congeners based on results of additional effluent monitoring, if the State Water Board develops the multi-media control strategy discussed in the SIP, or if the State Water Board provides other direction. This Order also requires the Discharger to identify the sources of detected dioxin congeners in its WWTP influent and effluent, and to implement measures to evaluate and reduce those detected dioxin congeners in its discharge to the receiving water. Special Provision VI.C.3.e of this Order requires the Discharger to prepare a 2,3,7,8-TCCD congeners source evaluation and minimization plan. Implementation measures to reduce detectable amounts of congeners may include source control and other effective means. Compliance with these requirements should result in the reduction of detectable amounts of dioxin congeners in the effluent discharged.

z. **Toxicity.** See Section IV.C.5 of the Fact Sheet regarding whole effluent toxicity.

4. WQBEL Calculations

a. Effluent limitations for aluminum, ammonia, cyanide, iron, and selenium, were calculated in accordance with section 1.4 of the SIP. The following paragraphs describe the methodology used for calculating effluent limitations.

b. **Effluent Limitation Calculations.** In calculating maximum effluent limitations, the effluent concentration allowances (ECAs) are calculated as follows:

$$ECA_{acute} = CMC \qquad ECA_{chronic} = CCC$$

For the human health, agriculture, or other long-term criterion/objective, the ECA is calculated as follows:

$$ECA_{HH} = HH + D(HH - B)$$

where:

ECA_{acute} = effluent concentration allowance for acute (one-hour average) toxicity criterion

$ECA_{chronic}$ = effluent concentration allowance for chronic (four-day average) toxicity criterion

ECA_{HH} = effluent concentration allowance for human health, agriculture, or other long-term criterion/objective

CMC = criteria maximum concentration (one-hour average)

CCC = criteria continuous concentration (four-day average, unless otherwise noted)

HH = human health, agriculture, or other long-term criterion/objective

D = dilution credit

B = maximum receiving water concentration

Acute and chronic toxicity ECAs were then converted to equivalent long-term averages (LTA) using statistical multipliers and the lowest is used. Additional statistical multipliers were then used to calculate the maximum daily effluent limitation (MDEL) and the average monthly effluent limitation (AMEL).

Human health ECAs are set equal to the AMEL and a statistical multiplier is used to calculate the MDEL.

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

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

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

where: $mult_{AMEL}$ = statistical multiplier converting minimum LTA to AMEL
$mult_{MDEL}$ = statistical multiplier converting minimum LTA to MDEL
M_A = statistical multiplier converting CMC to LTA
M_C = statistical multiplier converting CCC to LTA

Water quality-based effluent limitations were calculated for aluminum, ammonia, cyanide, iron, and selenium as follows in Tables F-6 through F-12, below.

Table F-611: WQBEL Calculations for Aluminium

	Discharge 001		Discharge 002	
	Acute	Chronic	Acute	Chronic
Criteria (µg/L) (1)	750	87	750	87
Dilution Credit	No Dilution	No Dilution	No Dilution	No Dilution
ECA	750	87	750	87
ECA Multiplier	0.321	0.527	0.319	0.526
LTA	241	45.9	240	45.7
AMEL Multiplier (95th%)	(2)	1.55	(2)	1.56
AMEL (µg/L)	(2)	**71**	(2)	**71**
MDEL Multiplier (99th%)	(2)	3.11	(2)	3.13
MDEL (µg/L)	(2)	**140**	(2)	**140**

1. USEPA Ambient Water Quality Criteria.
2. Limitations based on chronic LTA (Chronic LTA < Acute LTA).

Table F-712: WQBEL Calculations for Ammonia

	Discharge 001						Discharge 002					
	March 1 to October 31			November 1 to February 29			March 1 to October 31			November 1 to February 29		
	Acute	4-day	Chronic	Acute	4-day	Chronic	Acute	4-day	Chronic	Acute	4-day	Chronic
pH [1]	8.9	--	8.5	8.9	--	8.5	8.7	--	8.5	8.7	--	8.5
Temperature °C [2]	N/A	--	27.8	N/A	--	21.1	N/A	--	27.2	N/A	--	20.6
Criteria (mg/L) [3]	1.04	1.15	0.46	1.04	1.78	0.71	1.47	1.20	0.48	1.47	1.85	0.74
Dilution Credit	--	--	--	--	--		--	--	--	--	--	--
ECA	1.04	1.15	0.46	1.04	1.78	0.71	1.47	1.20	0.48	1.47	1.85	0.74
ECA Multiplier	0.22	0.40	0.69	0.32	0.53	0.78	0.34	0.55	0.80	0.27	0.47	0.74
LTA	0.23	0.46	0.32	0.34	0.94	0.56	0.50	0.66	0.38	0.40	0.86	0.55
AMEL Multiplier (99th%)	1.85	(5)	(5)	1.55	(5)	(5)	(6)	(6)	1.17	1.68	(5)	(5)
AMEL (mg/L) [4]	0.43	(5)	(5)	0.52	(5)	(5)	(6)	(6)	0.46	0.67	(5)	(5)
MDEL Multiplier (99th%)	4.48	(5)	(5)	3.09	(5)	(5)	(6)	(6)	2.91	3.70	(5)	(5)
MDEL (mg/L)	**1.04**	(5)	(5)	**1.04**	(5)	(5)	(6)	(6)	1.11	**1.47**	(5)	(5)

1. Acute design pH = maximum effluent or receiving stream pH, Chronic design pH = permitted maximum allowed pH of 8.5.
2. Temperature = Maximum 30-day average seasonal effluent temperature.
3. USEPA Ambient Water Quality Criteria.
4. Monthly average limitations are set equal to the 30-day criteria.
5. Limitations based on acute LTA.
6. Limitations based on chronic LTA.

	Discharge 001						Discharge 002					
	March 1 to October 31			November 1 to February 29			March 1 to October 31			November 1 to February 29		
	Acute[1]	4-day	Chronic[2]	Acute[1]	4-day	Chronic[2]	Acute[1]	4-day	Chronic[2]	Acute[1]	4-day	Chronic[2]
Criteria (mg/L)[3]	5.62	3.20	1.27	5.62	4.80	1.91	5.62	4.02	1.61	5.62	7.86	3.14
Dilution Credit	--	--	--	--	--	--	--	--	--	--	--	--
ECA	5.62	3.20	1.28	5.62	4.78	1.91	5.62	4.02	1.61	5.62	7.86	3.14
ECA Multiplier	0.24	0.43	0.71	0.50	0.69	0.87	0.23	0.42	0.70	0.34	0.55	0.80
LTA	1.34	1.36	0.91	2.79	3.30	1.66	1.31	1.68	1.13	1.93	4.34	2.50
AMEL Multiplier (95th%)	(6)	(6)	1.79	(6)	(6)	1.29	(6)	(6)	1.81	1.51	(5)	(5)
AMEL (mg/L)[4]	(6)	(6)	1.6	(6)	(6)	2.2	(6)	(6)	2.1	2.9	(5)	(5)
MDEL Multiplier (99th%)	(6)	(6)	4.18	(6)	(6)	2.01	(6)	(6)	4.29	2.90	(5)	(5)
MDEL (mg/L)	(6)	(6)	3.8	(6)	(6)	3.3	(6)	(6)	4.8	5.6	(5)	(5)

1. Acute design pH = permitted maximum allowed pH of 8.0.
2. Temperature corresponds to the lowest 99.9% CCC between the effluent and background receiving water.
3. USEPA Ambient Water Quality Criteria.
4. Monthly average limitations are set equal to the 30-day criteria.
5. Limitations based on acute LTA.
6. Limitations based on chronic LTA.

Table F-13: WQBEL Calculations For Copper – Discharge 002 only

	Acute	Chronic
Hardness (mg/L as $CaCO_3$)	260	260
Criteria (µg/L)[1]	33	20
Translator	0.960	0.960
Criteria (µg/L, total recoverable)	34	21
Dilution Credit	0	0
ECA[2]	34	21
ECA Multiplier[3]	0.28	0.48
LTA	9.6	10.1
AMEL Multiplier (95th%)[4]	1.7	[5]
AMEL (µg/L)	**16**	[5]
MDEL Multiplier (99th%)	3.6	[5]
MDEL (µg/L)	**34**	[5]

1. Metal's criteria are dissolved concentrations.
2. ECA calculated per Fact Sheet Section IC.C.2.b.
3. Acute and Chronic ECA Multiplier calculated at 99th percentile per Section 1.4.B, Step 3 of SIP or per Sections 5.4.1 and 5.5.4 of the TSD.
4. Assumes sampling frequency n = >4
5. Limitations based on 30-day acute LTA (Chronic LTA > Acute LTA)

Table F-~~8~~14: WQBEL Calculations for Cyanide – Discharge 001 only

	Acute	Chronic
Criteria (µg/L) (1)	22	5.2
Dilution Credit	No Dilution	No Dilution
ECA	22	5.2
ECA Multiplier	0.211	0.384
LTA	4.64	1.99
AMEL Multiplier (95th%)	(2)	1.91
AMEL (µg/L)	(2)	**3.8**
MDEL Multiplier (99th%)	(2)	4.74
MDEL (µg/L)	(2)	**9.5**

1. CTR aquatic life criteria.
2. Limitations based on chronic LTA (Chronic LTA < Acute LTA).

Table F-~~9~~15: WQBEL Calculations for Iron

	Discharge 001		Discharge 002	
	Acute	Chronic	Acute	Chronic
Criteria (mg/L) (1)	N/A	1	N/A	1
Dilution Credit	N/A	No Dilution	N/A	No Dilution
ECA	N/A	1	N/A	1
ECA Multiplier	N/A	0.527	N/A	0.527
LTA	N/A	0.527	N/A	0.527
AMEL Multiplier (95th%)	N/A	1.55	N/A	1.55
AMEL (mg/L)	N/A	**0.8**	N/A	**0.8**
MDEL Multiplier (99th%)	N/A	3.11	N/A	3.11
MDEL (mg/L)	N/A	**2**	N/A	**2**

1. USEPA Ambient Water Quality Criteria.

Table F-106: WQBEL Calculations for Selenium

	Discharge 001		Discharge 002	
	Acute	Chronic	Acute	Chronic
Criteria (µg/L) [1]	20	5	20	5
Dilution Credit	No Dilution	No Dilution	No Dilution	No Dilution
ECA	20	5	20	5
ECA Multiplier	0.472	0.671	0.456	0.657
LTA	9.44	3.35	9.11	3.29
AMEL Multiplier (95th%)	[2]	1.32	[2]	1.34
AMEL (µg/L)	[2]	**4.4**	[2]	**4.4**
MDEL Multiplier (99th%)	[2]	2.12	[2]	1.91
MDEL (µg/L)	[2]	**7.1**	[2]	**7.2**

1. CTR aquatic life criteria.
2. Limitations based on chronic LTA (Chronic LTA < Acute LTA).

Summary of Water Quality-based Effluent Limitations Discharge Point 001

Table F-117. Summary of Water Quality-based Effluent Limitations (EFF-001)

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
BOD 5-day @ 20°C	mg/L	10	15	20		
	lbs/day[1]	630	940	1300		
Total Suspended Solids	mg/L	10	15	20		
	lbs/day[1]	630	940	1300		
pH	standard units				6.5	8.58.0
Settleable Solids	mL/L	0.1		0.2		
Turbidity	NTU					10
Total Coliform Organisms	MPN/100 mL					240
Aluminum	ug/L	71		140		
Ammonia (1 March – 31 October)	mg/L	1.60.43		3.81.04		
	lbs/day[1]	10026.9		24065.1		
Ammonia (1 November– 29 February)	mg/L	2.20.52		3.31.04		
	lbs/day[1]	14032.5		21065.1		
Cyanide	ug/L	3.8		9.5		
Iron	mg/L	0.8		2		
Selenium	ug/L	4.4		7.1		
	lbs/day[1]	0.28		0.44		

1. Based on an average dry weather discharge flow of 7.5 mgd.

Summary of Water Quality-based Effluent Limitations
Discharge Point 002

Table F-128. Summary of Water Quality-based Effluent Limitations (EFF-002)

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
BOD 5-day @ 20°C	mg/L	10	15	20		
	lbs/day[1]	630	940	1300		
Total Suspended Solids	mg/L	10	15	20		
	lbs/day[1]	630	940	1300		
pH	standard units				6.5	~~8.5~~8.0
Settleable Solids	mL/L	0.1		0.2		
Turbidity	NTU					10
Total Coliform Organisms	MPN/100 mL					240
Aluminum	ug/L	71		140		
Ammonia (1 March – 31 October)	mg/L	~~0.46~~2.1		~~1.11~~4.8		
	lbs/day[1]	~~28.8~~130		~~69.4~~300		
Ammonia (1 November– 29 February)	mg/L	~~0.67~~2.9		~~1.47~~5.6		
	lbs/day[1]	~~41.9~~180		~~91.9~~350		
Copper, Total Recoverable	ug/L	16		34		
Iron	mg/L	0.8		2		
Selenium	ug/L	4.4		7.2		
	lbs/day[1]	0.28		0.45		

1. Based on an average dry weather discharge flow of 7.5 mgd.

5. Whole Effluent Toxicity (WET)

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

A review of the Report of Waste Discharge indicates toxicity in the effluent. The percent survival of Ceriodaphnia dubia from the chronic toxicity test was 60 % in both June 2003 and May 2005. The chronic test for larval fathead minnow growth showed impacts from the effluent in August 2002 and October 2002. The chronic test for Ceriodaphnia dubia reproduction showed impacts from the effluent in August 2002, October 2002, February 2003, June 2003, August 2004, October 2004. The 4-day algal growth test showed impacts from the effluent on May 2002, June 2002, February 2003, June 2003, June 2004, and June 2005. Algal growth tended to be significantly greater than the control in Discharge 001 and significantly less than the control in Discharge 002. The toxicity tests conducted up to date have used 100 % effluent from the wastewater treatment plant. With a low available dilution and whole effluent testing results showing impacts to aquatic life, it is concluded that discharges from the WWTP have caused adverse effects on aquatic organisms. This Order requires the Discharger to initiate a TRE to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity if ~~a pattern of~~ toxicity is observed during accelerated monitoring.

a. **Acute Aquatic Toxicity.** The Basin Plan states that "…*effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate*…". Effluent limitations for acute toxicity have been included in this Order.

b. **Chronic Aquatic Toxicity.** The Basin Plan contains a narrative toxicity objective that states, "All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life." (Basin Plan at III-8.00) Based on quarterly whole effluent chronic toxicity testing performed by the Discharger from May 2002 through May 2005, the discharge has reasonable potential to cause or contribute to an to an in-stream excursion above of the Basin Plan's narrative toxicity objective.

   No dilution has been granted for the chronic condition. Therefore, chronic toxicity results exceeding 1 chronic toxicity units (TUc) demonstrates the discharge has a reasonable potential to cause or contribute to an exceedance of the Basin Plan's narrative toxicity objective. Therefore, in accordance with State Water Board Order WQO 2003-0012 for the Los Coyotes and Long Beach Wastewater Reclamation Plant and WQO 2008-0008 for the City of Davis Wastewater Plant, this Order includes a narrative effluent limitation for chronic whole effluent toxicity.

~~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 an 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 whole effluent toxicity testing, as specified in the Monitoring and Reporting Program (Attachment E, Section V.). Furthermore, Special Provisions 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, ~~T~~the Discharger is required to initiate a Toxicity Reduction Evaluation (TRE), in accordance with an approved TRE work plan. 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.

[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)

D. Final Effluent Limitations

1. Mass-based Effluent Limitations

Title 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 permitted average dry weather discharge flow allowed in Section IV.A.1.j. and Section IV.A.2.j of the Limitations and Discharge Requirements. Mass limitations are included for BOD, TSS, ammonia, mercury, and selenium.

2. Averaging Periods for Effluent Limitations

Title 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, the USEPA recommends the use of a maximum daily effluent limitation in lieu of average weekly effluent limitations for two reasons. "*First, the basis for the 7-day average for POTWs derives from the secondary treatment requirements. This basis is not related to the need for assuring achievement of water quality standards. Second, a 7-day average, which could comprise up to seven or more daily samples, could average out peak toxic concentrations and therefore the discharge's potential for causing acute toxic effects would be missed.*" (TSD, pg. 96) This Order utilizes maximum daily effluent limitations in lieu of average weekly effluent limitations for aluminum, ammonia, cyanide, iron, selenium, and settleable solids 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 BOD and TSS, weekly average effluent limitations have been supplemented with maximum daily effluent limitations. This Order utilizes only monthly limitations for mercury. In lieu of weekly and monthly effluent limitations, this Order utilizes instantaneous minimum and/or maximum limitations for pH. Temperature, total coliform organisms, turbidity, acute toxicity, total residual chlorine, and average flow limitations are based on other periods. The rationale for using other periods for these constituents is discussed in Attachment F, Section IV.C.3., above.

3. Satisfaction of Anti-Backsliding Requirements

Some effluent limitations in this Order are less stringent that those in the previous Order. As discussed below this relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.

a. **Stayed Limitations.** Order No. 5-01-067 contained effluent limitations for BOD, TSS, turbidity, settleable solids, chlorine residual, ammonia, organochlorine pesticides, copper, dioxin and congeners, PAH's, selenium, and total coliform organisms that were stayed by an 8 May 2003 State Water Board Stipulation for Order Resolving Petition for Review OCC File A-1374 (Stipulation). The Stipulation required that the Regional Water Board "develop the permit on remand in light of the current record and new information developed on remand."

This Order includes effluent limitations for all the constituents stayed by the Stipulation except for copper, total dioxins and congeners, polycyclic aromatic hydrocarbons (PAH's) and organochlorine pesticides for both Discharge 001 and Discharge 002. A review of the effluent monitoring data from May 2002 through May 2005 shows PAH's and organochlorine pesticides have not been detected in recent effluent samples. Therefore, this Order does not include effluent limitations for PAH's and organochlorine pesticides for both Discharge 001 and Discharge 002. A review of the effluent monitoring data from May 2002 through May 2005 shows the effluent does not have reasonable potential to exceed the CTR copper criteria. This Order does not contain an effluent limitation for dioxin and congeners since 2,3,7,8-TCDD (the only CTR dioxin congener) was not detected in the effluent from May 2002 through May 2005.

This Order contains effluent limitations for BOD, TSS, turbidity, chlorine residual, ammonia, and selenium that are different from the stayed effluent limitations. Order No. 5-01-067 contained daily maximum, weekly average, and monthly average mass-based effluent BOD and TSS limitations of 1252 lb/day, 939 lb/day, and 625 lb/day, respectively; this Order contains these mass-based effluent BOD and TSS limitations rounded to two significant digits. Order No. 5-01-067 contained a daily maximum effluent turbidity limit of 5 NTU; this Order requires that effluent turbidity not exceed 5 NTU more than 5% of the time within a 24-hour period and contains an additional instantaneous maximum limitation of 10 NTU. The previous permit had (stayed) mass limits for chlorine residual. The floating (stayed) effluent limitations for ammonia in the previous permit have been replaced with fixed effluent limitations. The previous permit had 1-hour average and 4-day average (stayed) limits for selenium. These have been revised to average monthly and maximum daily limits.

b. **Converted Limitations and Monitoring.** Order No. 5-01-067 contained daily maximum chlorine residual and weekly average selenium effluent limitations that were not stayed by the Stipulation. This Order contains effluent limitations for chlorine residual and selenium that have been revised to have different averaging periods, as described in the Fact Sheet, Section IV.D.2. This Order includes daily and monthly effluent selenium limitations that are based off of the

criteria of 5.0 ug/L are as stringent as the stayed limitations and more stringent than the weekly effluent selenium limitations.

The previous Order's Monitoring and Reporting Program (MRP) required the Discharger calculate and record daily effluent limitations for ammonia, and quarterly effluent limitations for ammonia and copper. This was necessary in the previous Order since the ammonia and copper effluent limitations were floating limitations. This Order contains fixed ammonia effluent limitations and ~~no~~ copper effluent limitations for Discharge 002, therefore, it does not include the previous MRP requirement to calculate and record daily effluent limitations for ammonia and copper.

c. **Biosolids.** Order No. 5-01-067 required that every April, the Discharger shall submit a biosolids disposal plan describing the annual volume of biosolids generated by the plant, specifying the disposal practices, and demonstrating how the sludge meets Class B or higher. Order No. 5-01-067 also contained biosolids application limitations that are not included in this Order. This Order prohibits the application of biosolids to the overland flow fields and wetlands effective 1 December 2008 and requires the Discharger to develop a Sludge Management Plan and submit a complete application (i.e., Report of Waste Discharge or Notice of Intent) for any proposed biosolids application. Because this Order does not allow the Discharger to apply biosolids, the existing requirement for biosolids application limitations and an annual biosolids disposal plan have been removed.

4. Satisfaction of Antidegradation Policy

a. **Surface Water.** The permitted surface water discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution 68-16. This Order does not allow an increase in flow from the previous permit. 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.

The Regional Water Board finds that this Order, as amended by Order No. R5-2010-0097 to revise the ammonia effluent limitations is in the maximum benefit to the people of the State. The increase in ammonia loading does not increase the toxicity due to the revised and more stringent instantaneous maximum pH effluent limitation. The amendment does not allow for an increase in toxicity, allows for an immeasurable impact on the dissolved oxygen level, and complies with the Basin Plan. Therefore, the resulting degradation will be an insignificant increase in ammonia mass loading and does not unreasonably affect present and anticipated beneficial uses. Therefore, the amendment is in accordance with federal and State antidegradation provisions.

b. **Groundwater.** The Discharger utilizes oxidation ponds, unlined sludge lagoons, overland flow fields, and 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, sludge lagoons, overland flows fields, and wetlands 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 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 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 indicates that electrical conductivity may have degraded groundwater quality when compared to background. This Order requires the Discharger to evaluate the background groundwater quality to establish effluent limitations for groundwater. This Order also requires the implementation of BPTC measures to minimize impacts to groundwater.

E. Interim Effluent Limitations

1. **Aluminum, ammonia, cyanide, electrical conductivity, iron, and selenium.** The SIP, section 2.2.1, requires that if a compliance schedule is granted for a CTR or NTR constituent, the Regional Water Board shall establish interim requirements and dates for their achievement in the NPDES permit. The interim limitations must be based on current treatment plant performance or existing permit limitations, whichever is more stringent. The State Water Board has held that the SIP may be used as guidance for non-CTR constituents. Therefore, the SIP requirement for interim effluent limitations has been applied to both CTR and non-CTR constituents in this Order.

   The interim limitations for aluminum, ammonia, cyanide, electrical conductivity, iron, and selenium in this Order are based on the current treatment plant performance. In developing the interim limitation, where there are ten 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% of the data points will lie within 3.3 standard deviations of the mean (*Basic Statistical Methods for Engineers and Scientists, Kennedy and Neville, Harper and Row*). Therefore, the interim limitations

in this Order are established as the mean plus 3.3 standard deviations of the available data.

When there are less than ten sampling data points available, the *Technical Support Document for Water Quality- Based Toxics Control* ((EPA/505/2-90-001), TSD) recommends a coefficient of variation of 0.6 be utilized as representative of wastewater effluent sampling. The TSD recognizes that a minimum of ten data points is necessary to conduct a valid statistical analysis. The multipliers contained in Table 5-2 of the TSD are used to determine a maximum daily limitation based on a long-term average objective. In this case, the long-term average objective is to maintain, at a minimum, the current plant performance level. Therefore, when there are less than ten sampling points for a constituent, interim limitations are based on 3.11 times the maximum observed effluent concentration to obtain the daily maximum interim limitation (TSD, Table 5-2).

Even though there fewer than 10 data points for the EC yearly average, the statistical approach was used to develop interim EC limitations based on best professional judgment. The resulting interim effluent limitations are more reasonable using the statistical approach.

The Regional 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 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.

Tables F-194, F-2015, and F-2116 summarize the calculations of the interim effluent limitations for aluminum, ammonia, cyanide, electrical conductivity, iron, and selenium:

Table F-139. Interim Effluent Limitation Calculation Summary –Discharge 001

Parameter	Units	Maximum Concentration	Mean	Std. Dev.	# of Samples	Interim Limitation
Aluminum	ug/L	700	470	170	8	2200
Ammonia	mg/L	19.5	4.9	4.7	410	20.5
Cyanide	ug/L	6	2.3	2.2	10	9.6
Iron	mg/L	1.3	1.1	0.26	4	4.0
Selenium	ug/L	5.6	2.6	0.93	22	7.1[1]

1. Using the equations to determine interim limitations, the interim limitation for selenium would be 5.6 ug/L. However, the final effluent limitations for selenium are 7.1 ug/L as a daily maximum and 4.4 as a monthly average. Since the daily maximum final effluent limitation for selenium is higher than the calculated interim effluent limitation, the interim limitation for selenium is set equal to 7.1 as a daily maximum (with no monthly average limitation).

Table F-2014. Interim Effluent Limitation Calculation Summary –Discharge 002

Parameter	Units	Maximum Concentration	Mean	Std. Dev.	# of Samples	Interim Limitation
Aluminum	ug/L	3200	2200	1300	10	6500
Ammonia	mg/L	11.0	2.84	3.14	366	13.2
Iron	mg/L	4.6	3.9	0.95	4	14
Selenium	ug/L	4	2.4	.91	23	7.2 [1]

1. Using the equations to determine interim limitations, the interim limitation for selenium would be 5.4 ug/L. However, the final effluent limitations for selenium are 7.2 ug/L as a daily maximum and 4.4 as a monthly average. Since the daily maximum final effluent limitation for selenium is higher than the calculated interim effluent limitation, the interim limitation for selenium is set equal to 7.2 as a daily maximum (with no monthly average limitation).

Table F-1521. Interim Effluent Limitation Calculation Summary –Discharge 001 & 002

Parameter	Units	Maximum Concentration	Mean	Std. Dev.	# of Samples	Interim Limitation
Electrical Conductivity	umhos/cm	1960	1920	38	3[1,2]	2050[3]

1. Although there were less than 10 samples, the interim limitations are established as the mean plus 3.3 standard deviations of the available data.
2. Three sets of annual averages used.
3. As an annual average. Although there are only three sets of annual averages, the interim limit was established based on the mean plus 3.3 times the standard deviation.

2. **BOD, TSS, Total Coliform Organisms, and Turbidity.** The establishment of tertiary limitations has not been previously required for this discharge; therefore, a schedule for compliance with the tertiary treatment requirements is included as a Provision in this Order. This Order provides interim effluent limitations for BOD, TSS, and total coliform based on the existing effluent limitations required by Order No. 96-104, which the Discharger is currently capable of meeting. Full compliance with the final effluent limitations for BOD, TSS, total coliform, and turbidity are not required by this Order until 25 October 2017.

F. Land Discharge Specifications

1. The Land Discharge Specifications are necessary to protect the beneficial uses of the groundwater and to prevent nuisance.

G. Reclamation Specifications – NOT APPLICABLE

H. Wetlands Specifications

1. The Wetlands Specifications are necessary to protect the aquatic life and wildlife in contact with the wetlands and to prevent nuisance.

I. Biosolids Specifications

1. The Biosolids Specifications are necessary to protect the beneficial uses of surface and groundwater and to prevent nuisance. This Order prohibits discharge of biosolids to the wetlands and overland flow fields since this practice does not represent best practicable treatment or control.

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

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

A. Surface Water

1. CWA section 303(a-c), requires states to adopt water quality standards, including criteria where they are necessary to protect beneficial uses. The Regional Water Board adopted water quality criteria as water quality objectives in the Basin Plan. The Basin Plan states that "*[t]he numerical and narrative water quality objectives define the least stringent standards that the Regional 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, chemical constituents, color, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, and turbidity.

   Numeric Basin Plan objectives for bacteria, dissolved oxygen, pH, temperature, and turbidity are applicable to this discharge and have been incorporated as Receiving Surface Water Limitations. Rationale for these narrative and numeric receiving surface water limitations are as follows:

   a. **Bacteria.** The Basin Plan includes a water quality objective that "*[I]n water designated for contact recreation (REC-1), the fecal coliform concentration based on a minimum of not less than five samples for any 30-day period shall not exceed a geometric mean of 200/100 ml, nor shall more than ten percent of the*

total number of samples taken during any 30-day period exceed 400/100 ml." Numeric Receiving Water Limitations for bacteria are included in this Order and are based on the Basin Plan objective.

b. **Biostimulatory Substances.** The Basin Plan includes a water quality objective that "*[W]ater shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses."* Receiving Water Limitations for biostimulatory substances are included in this Order and are based on the Basin Plan objective.

c. **Chemical Constituents.** The Basin Plan includes a water quality objective that *"[W]aters shall not contain chemical constituents in concentrations that adversely affect beneficial uses."* Receiving Water Limitations for chemical constituents are included in this Order and are based on the Basin Plan objective.

d. **Color.** The Basin Plan includes a water quality objective that "*[W]ater shall be free of discoloration that causes nuisance or adversely affects beneficial uses."* Receiving Water Limitations for color are included in this Order and are based on the Basin Plan objective.

e. **Dissolved Oxygen.** The Yolo Bypass, to which the Willow Slough Bypass and Conaway Ranch Toe Drain are tributary, has been designated as having the beneficial use of potential cold freshwater aquatic habitat (COLD). The *Habitat Improvement for Native Fish in the Yolo Bypass*, states that "considering the four runs of salmon present, adult migration may occur in any month," which indicates the presence of cold freshwater fish in the Yolo Bypass year-round. For water bodies designated as having COLD as a beneficial use, the Basin Plan includes a water quality objective of maintaining a minimum of 7.0 mg/L of dissolved oxygen. Since the beneficial uses of the Yolo Bypass apply to the Willow Slough Bypass and Conaway Ranch Toe Drain, a receiving water limitation of 7.0 mg/L for dissolved oxygen was included in this Order.

   For surface water bodies outside of the Delta, the Basin Plan includes the water quality objective that "…*the monthly median of the mean daily dissolved oxygen (DO) concentration shall not fall below 85 percent of saturation in the main water mass, and the 95 percentile concentration shall not fall below 75 percent of saturation.*" This objective was included as a receiving water limitation in this Order.

f. **Floating Material.** The Basin Plan includes a water quality objective that *"[W]ater shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses."* Receiving Water Limitations for floating material are included in this Order and are based on the Basin Plan objective.

g. **Oil and Grease.** The Basin Plan includes a water quality objective that *"[W]aters shall not contain oils, greases, waxes, or other materials 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."* Receiving

Water Limitations for oil and grease are included in this Order and are based on the Basin Plan objective.

h. **pH.** The Basin Plan includes water quality objective that *"[T]he pH shall not be depressed below 6.5 nor raised above 8.5~~. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses~~.*" This Order includes receiving water limitations for ~~both~~ pH range~~ and pH change~~, based on these objectives.

~~The Basin Plan allows an appropriate averaging period for pH change in the receiving stream. Since available technical information indicates that aquatic organisms are not adversely affected by shifts in pH within the 6.5 to 8.5 range, an averaging period is considered appropriate and a monthly averaging period for determining compliance with the 0.5 receiving water pH limitation is included in this Order.~~

i. **Pesticides.** The Basin Plan includes a water quality objective for pesticides beginning on page III-6.00. Receiving Water Limitations for pesticides are included in this Order and are based on the Basin Plan objective.

j. **Radioactivity.** The Basin Plan includes a water quality objective that *"[R]adionuclides shall not 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."* The Basin Plan states further that *"[A]t a minimum, waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 4 (MCL Radioactivity) of section 64443 of Title 22 of the California Code of Regulations…"* Receiving Water Limitations for radioactivity are included in this Order and are based on the Basin Plan objective.

k. **Suspended Sediments.** The Basin Plan includes a water quality objective that *"[T]he suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses"* Receiving Water Limitations for suspended sediments are included in this Order and are based on the Basin Plan objective.

l. **Settleable Substances.** The Basin Plan includes a water quality objective that *"[W]aters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses."* Receiving Water Limitations for settleable material are included in this Order and are based on the Basin Plan objective.

m. **Suspended Material.** The Basin Plan includes a water quality objective that *"[W]aters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses."* Receiving Water Limitations for

suspended material are included in this Order and are based on the Basin Plan objective.

n. **Taste and Odors.** The Basin Plan includes a water quality objective that *"[W]ater 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."* Receiving Water Limitations for taste- or odor-producing substances are included in this Order and are based on the Basin Plan objective.

o. **Temperature.** The Willow Slough Bypass and Conaway Ranch Toe Drain have the beneficial uses of both potential COLD and existing WARM. The Basin Plan includes the objective that "[a]*t no time or place shall the temperature of COLD or WARM intrastate waters be increased more than 5ºF above natural receiving water temperature*." This Order includes a receiving water limitation based on this objective. Compliance is to be determined based on the difference in temperature at RSW-001U and RSW-001D and/or RSW-002U and RSW-002D.

p. **Toxicity.** The Basin Plan includes a water quality objective that *"[A]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life."* Receiving Water Limitations for toxicity are included in this Order and are based on the Basin Plan objective.

q. **Turbidity.** The Basin Plan includes a water quality objective that "*[I]ncreases in turbidity attributable to controllable water quality factors shall not exceed the following limits:*

- *Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.*
- *Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.*
- *Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.*
- *Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent*."

A numeric Receiving Surface Water Limitation for turbidity is included in this Order and is based on the Basin Plan objective for turbidity.

Compliance is to be determined based on the difference in turbidity at RSW-001U and RSW-001D and/or RSW-002U and RSW-002D.

B. Groundwater

1. The beneficial uses of the underlying ground water are municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply.

2. Basin Plan water quality objectives include narrative objectives for chemical constituents, tastes and odors, and toxicity of groundwater. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective states groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use. The tastes and odors objective prohibits taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plan also establishes numerical water quality objectives for chemical constituents and radioactivity in groundwaters designated as municipal supply. These include, at a minimum, compliance with MCLs in Title 22 of the CCR. The bacteria objective prohibits coliform organisms at or above 2.2 MPN/100 ml. The Basin Plan requires the application of the most stringent objective necessary to ensure that waters do not contain chemical constituents, toxic substances, radionuclides, taste- or odor-producing substances, or bacteria in concentrations that adversely affect municipal or domestic supply, agricultural supply, industrial supply or some other beneficial use.

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

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorize the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (MRP), Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the 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.*, BOD and TSS reduction requirements). The previous permit contained influent monitoring for flow, hardness, electrical conductivity, pH, BOD, TSS, ammonia, and priority pollutants. This Order includes influent monitoring for flow, BOD, TSS, electrical conductivity, and pH.

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. To assess compliance with effluent limitations, this Order requires effluent monitoring for BOD, TSS, pH, settleable solids, turbidity, total coliform organisms, aluminum, ammonia, electrical conductivity (EC), iron, selenium, acute whole effluent toxicity, mercury, temperature, total residual chlorine, and flow for both Discharge 001 and Discharge 002; ~~and~~ effluent monitoring for cyanide for Discharge 001; and effluent monitoring for copper for Discharge 002. Since the effluent hardness affects the toxicity of some of these constituents, this Order includes effluent monitoring for hardness.

2. Effluent monitoring for TDS, boron, sodium, and chloride is necessary to monitor the ratio of TDS, boron, sodium, and chloride to EC.

3. The SIP states that if "…*all reported detection limits of the pollutant in the effluent are greater than or equal to the C* [water quality criterion or objective] *value, the RWQCB* [Regional Water Board] *shall establish interim requirements…that require additional monitoring for the pollutant….*" All reported detection limits for the following priority pollutants: acrylonitrile, pentachlorophenol, benzidine, benzo(a)anthracene, benzo(a)pyrene, benzo(b)fluoranthene, benzo(k)fluoranthene, chrysene, 3,3'-dichlorobenzidine, hexachlorobenzene, and persistent chlorinated hydrocarbon pesticides are greater than or equal to corresponding applicable water quality criteria or objectives. Monitoring for these constituents has been included in this Order in accordance with the SIP.

4. Although the three-year period for the reasonable potential analysis (May 2002 through May 2005) did not include any copper data above the CTR criteria, more recent effluent data (May 2006, May 2007) shows Discharge 002 above the CTR criteria. Therefore, monthly copper monitoring is required for Discharge 002.

5. This Order includes monitoring of dioxin and congeners because the following dioxin congeners were detected in the effluent from May 2002 through May 2005: 1,2,3,4,6,7,8-HeptaCDD OCDD, Total HpCDD, Total HxCDF, Total PeCDF in both Discharge 001 and Discharge 002; Total TCDF and Total TCDD in Discharge 001; and Total HxCDD in Discharge 002.

6. The previous Order included effluent monitoring for flow, chlorine residual, turbidity, pH, temperature, electrical conductivity, total coliform organisms, ammonia, BOD, TSS, settleable solids, oil and grease, TDS, hardness, copper, bis(2-ethylhexyl)phthalate, nitrate, polycyclic aromatic hydrocarbons, selenium, organochlorine pesticides, aluminum, chromium VI, dioxin (2,3,7,8-TCDD) & congeners, acute bioassay, chronic biossay, and priority pollutants. In addition to the constituents discussed in VI B.1, B.2, B.3, B.4, and B.5, this Order includes monitoring for oil and grease, and priority pollutants. Monitoring requirements for nitrate and polycyclic aromatic hydrocarbons have not been included in this Order since there is no reasonable potential for these constituents.

7. Tertiary treatment requirements and electrical conductivity requirements are established at EFF-A, after disinfection. The California Department of Public Health (DPH) 26 August 1983 *Uniform Guidelines for Sewage Disinfection* states "wastewater shall be considered to be adequately disinfected if at some point in the treatment process the median MPN of the total coliform organisms does not exceed 2.2/100 mL." Effluent monitoring point EFF-A was established to allow the Discharger to demonstrate the effluent meets tertiary treatment at that point in the treatment process, prior to discharge to the wetlands.

C. Whole Effluent Toxicity Testing Requirements

1. **Acute Toxicity.** Monthly 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. Section 13267 of the California Water Code states, in part, *"(a) A Regional Water Board, in establishing…waste discharge requirements… may investigate the quality of any waters of the state within its region*" and *"(b) (1) In conducting an investigation…, the Regional Water Board may require that any person who… discharges… waste…that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Regional Water Board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports*." The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the 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 (Attachment E) is issued pursuant to California 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 68-16 and the Basin Plan.

c. Beneficial uses of groundwater include municipal and domestic (MUN) and agricultural water supply. The Basin Plan states, on page III-9.0: "Groundwater shall not contain chemical constituents in concentrations that adversely affect beneficial uses." The recommended secondary MCL for electrical conductivity is 900 µmhos/cm. The agricultural water quality screening value is 700 µmhos/cm. Groundwater sampling results provided by the Discharger in the Report of Waste Discharge indicate that elevated level of electrical conductivity was detected in the down-gradient monitoring well MW-6 at a maximum level of 7240 µmhos/cm. Groundwater sampling results from May 2002 through May 2005 revealed that levels of electrical conductivity are higher in groundwater near the wetlands. It indicates that the discharge from the wastewater treatment plant has a reasonable potential for wastewater percolating to the groundwater to cause or contribute to cause elevated levels of electrical conductivity in the groundwater. However, background groundwater quality has not been established.

d. 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 Regional Board plans and policies, including Resolution 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. Pond Monitoring

Pond Monitoring is required to assess compliance with the land discharge specifications. Land discharge specifications are imposed to prevent nuisance, protect the public health, and maintain the integrity of the treatment system.

2. Wetlands Monitoring

Wetlands monitoring is required to assess compliance with the wetlands specifications. Wetlands specifications are imposed to protect human, plant, animal, and aquatic life and to prevent nuisance.

3. Water Supply Monitoring

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

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with 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.

Section 122.41(a)(1) and (b) through (n) establish conditions that apply to all State-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. Section 123.25(a)(12) allows the state to omit or modify conditions to impose more stringent requirements. In accordance with section 123.25, this Order omits federal conditions that address enforcement authority specified in 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 Order contains mass effluent limitations for mercury. This reopener provision allows the Regional Water Board to adjust the mercury limitations if mercury is found to be causing toxicity or if a TMDL program is adopted.

b. **Pollution Prevention.** This Order requires the Discharger to prepare and implement pollution prevention plans following CWC section 13263.3(d)(3) for cyanide, selenium, aluminum, and iron. This reopener provision allows the Regional 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. The Pollution Prevention Plan required herein is not incorporated by reference into this Order.

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 additional site-specific dissolved-to-total metal translators, this Order may be reopened to modify the effluent limitations for the applicable inorganic constituents.

e. **Constituent Study.** The reopener provisions allow the Regional Water Board to reopen this Order for addition of effluent limitations if it is determined that the discharge has a reasonable potential to cause or contribute to an exceedance of a water quality objective.

f. **Manganese.** The reopener provisions allow the Regional Water Board to reopen this Order for addition of final effluent limitations for manganese based on a review of the Manganese Study required by this Order.

g. **EC, Boron, Sodium, and Chloride Study.** The reopener provisions allow the Regional Water Board to reopen this Order for addition of final effluent limitations for EC, boron, sodium, and chloride based on a review of the EC, Boron, Sodium, and Chloride Study required by this Order.

h. **Reuse Feasibility Study.** The reopener provision allows the Regional Water Board to reopen this Order to include additional requirements and/or to amend compliance dates to implement reuse on the Conaway Ranch if the Discharger determines that reuse is feasible.

2. Special Studies and Additional Monitoring Requirements

a. **Chronic Whole Effluent Toxicity Requirements.** The Basin Plan contains a narrative toxicity objective that states, "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at III-8.00.) Based on quarterly whole effluent chronic toxicity testing performed by the Discharger from May 2002 through May 2005, the discharge has reasonable potential to cause or contribute to an to an in-stream excursion above of the Basin Plan's narrative toxicity objective.

This provision requires the Discharger to develop a Toxicity Reduction Evaluation (TRE) Work Plan in accordance with EPA guidance. In addition, the provision provides a numeric toxicity monitoring trigger and requirements for accelerated monitoring, as well as, requirements for TRE initiation if ~~a pattern of~~ 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 ~~a pattern of~~ 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 ~~a pattern of~~ 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.

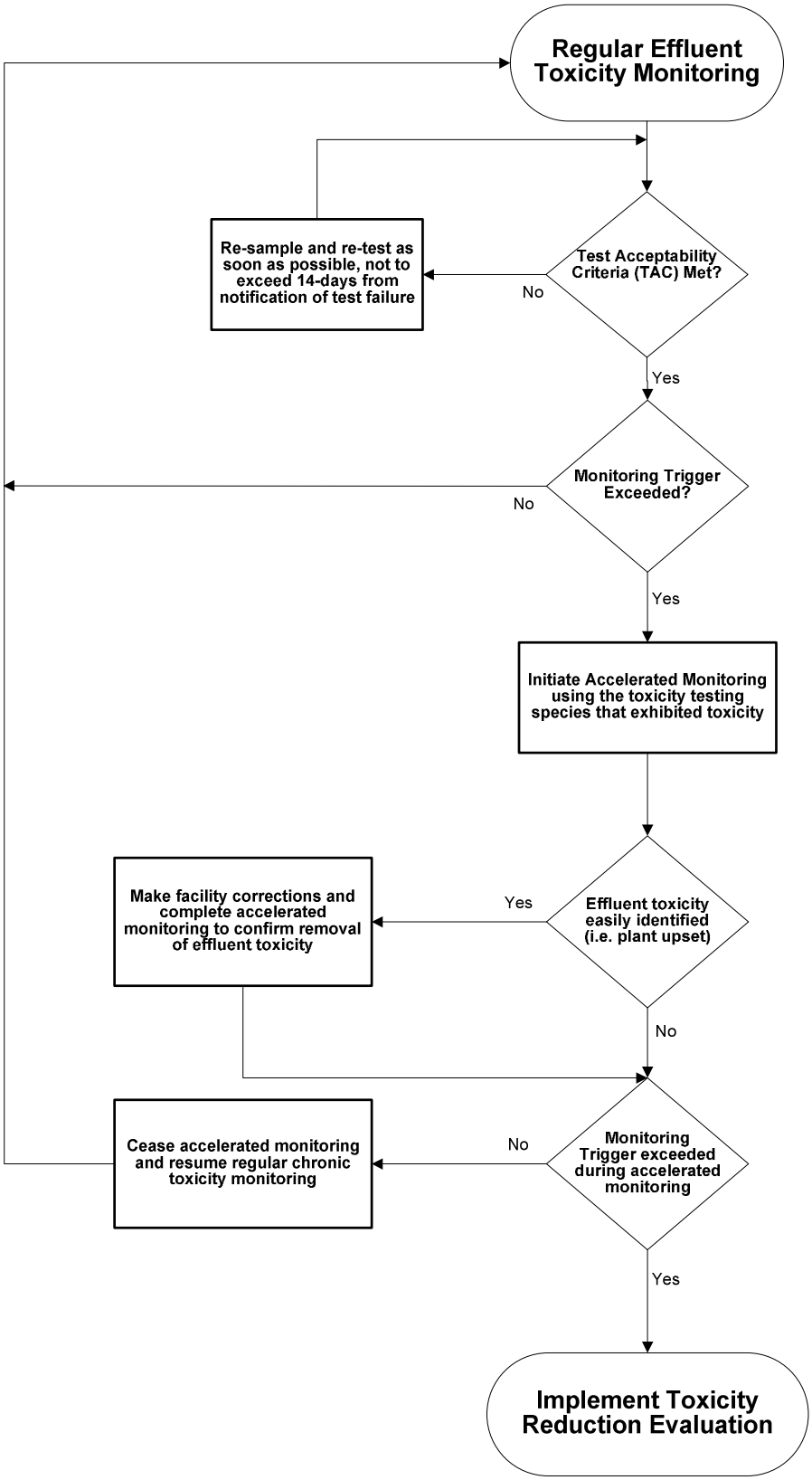
The provision requires accelerated monitoring consisting of four chronic toxicity tests every two weeks using the species that exhibited toxicity. Guidance regarding accelerated monitoring and TRE initiation is provided in the *Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, 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 ~~a pattern 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-3), 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 Work Plan in accordance with USEPA guidance. Numerous guidance documents are available, as identified below:

- *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants,* (EPA/833B-99/002), August 1999.
- Generalized Methodology for Conducting Industrial TREs*, (EPA/600/2-88/070), April 1989.*
- *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures,* Second Edition, EPA 600/6-91/005F, 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-3
WET Accelerated Monitoring Flow Chart



b. **Constituent Study.** From May 2002 through May 2005, the maximum effluent concentrations of the following constituents were near, but below the criteria: fluoride and nickel in both Discharge 001 and Discharge 002; lead and oil and grease in Discharge 001; and acrolein and cyanide in Discharge 002. The maximum effluent concentrations of zinc and diethyl phthalate were detected above the criteria in March 2001 and June 2001, respectively, in Discharge 001. Dalapon (a persistent chlorinated hydrocarbon pesticide) was detected above the criteria in March 2002 in Discharge 002. This Order does not include effluent limitations for fluoride and nickel for both Discharge 001 and Discharge 002, lead, zinc, oil and grease, and diethyl phthalate for Discharge 001, and acrolein, cyanide, and persistent chlorinated hydrocarbon pesticides for Discharge 002. Instead, this Order requires a constituent Study of these constituents and includes a reopener that effluent limitations may be added for these constituents if additional data demonstrates reasonable potential.

c. **Manganese Study:** The Ayers and Westcot 1985 Study states that manganese is "[t]oxic to a number of crops at a few-tenths to a few mg/l, but usually only in acid soils." The Yolo Bypass soils are not generally acidic, which could affect manganese requirements in the bypass. This Order requires the Discharger to conduct a site-specific study that assesses the influence of soil chemistry on manganese requirements for irrigation waters downstream of the discharge.

d. **EC, Boron, Sodium, and Chloride Study:** The Ayers and Westcot 1985 Study indicates that site-specific factors, such as rainfall and flooding, should be considered in determining protective EC levels in irrigation water. Significant flooding occurs in the Yolo Bypass, which could affect EC requirements for irrigation waters used in the bypass. This Order requires the Discharger to conduct a site-specific study that assesses the influence of soil chemistry, climatic conditions, rainfall and flooding, and background water quality on EC/salinity requirements for irrigation waters downstream of the discharge. In lieu of conducting a site-specific study, if appropriate, the Discharger may submit a report showing it has implement EC study results from other dischargers in the area (e.g., City of Woodland).~~request to implement the City of Woodland's EC study results once they are approved.~~

e. **BPTC Evaluation Tasks.** The Discharger dewaters biosolids in unlined sludge lagoons. Because the sludge lagoons are unlined, leachate from the sludge has the potential to percolate through the underlying soil to groundwqater. Leachate from unlined sludge lagoons may degrade or pollute groundwater. Certain aspects of waste treatment or control practices can be improved and therefore cannot be justified as representative of BPTC (e.g., unlined sludge lagoons).

f. **Groundwater Monitoring (Special Provisions VI.C.2.d.).** To determine compliance with Groundwater Limitations V.B. and evaluate the feasibility of wastewater reuse, the Discharger is required to evaluate the adequacy of its groundwater monitoring network. This provision requires the Discharger to

evaluate its groundwater monitoring network to ensure there are one or more background monitoring wells and a sufficient number of designated monitoring wells downgradient of every treatment, storage, and disposal unit that does or may release waste constituents to groundwater. Currently, there are no groundwater monitoring wells downgradient of the unlined sludge drying beds and lined aerated lagoons. The Discharger must install new groundwater monitoring wells, if necessary, collect two year of monitoring data, and submit a report evaluating the underlying groundwater by 1 ~~September 2010~~February September 2012. If the monitoring shows that any constituent concentrations are increased above background water quality, ~~by 1 September 2011~~30 November ~~2012~~by the schedule described in Section VI.C.2.e of this Order, the Discharger shall submit a technical report describing the groundwater evaluation report results and critiquing each evaluated facility component with respect to BPTC, potential wastewater reuse and minimizing the discharge's impact on groundwater quality.

g. **Reuse Feasibility Study.** To determine the feasibility of reusing treated effluent at the Conaway Ranch and thereby eliminating its discharge to surface water, the Discharger shall evaluate the technical, logistical and economic feasibility of conveying treated effluent to the Conaway Ranch for agricultural reuse consistent with Title 22 of the California Code of Regulations. Studies to determine the feasibility of reuse should include, but are not limited to, water balance analysis, nutrient and salt balance (agronomic rates for crop types to be grown), potential groundwater impact evaluations, evaluation of current groundwater background quality at the Conaway Ranch site, evaluation of treatment needs, evaluation of impacts to receiving water if discharge removed, and economic impacts to the City. The Discharger shall comply with the time schedule identified in Section VI.C.2.g in conducting the studies to determine the feasibility of reuse at the Conaway Ranch. If the City fails to comply with the study requirements set forth below, this Order may be reopened and the compliance schedule for meeting final effluent limitations may be revised to eliminate the remaining time available to evaluate reuse.

h. **Priority Pollutant Metals Study.** This Order requires the Discharger to complete and submit a Metals Study. Based on a review of the results of the Study, this Order may be reopened to add or modify effluent limitations and requirements for any priority pollutant metal based on a review of the Metals Study.

3. Best Management Practices and Pollution Prevention

a. **Pollution Prevention Plan (PPP) for cyanide, selenium, aluminum, and iron.** A PPP for cyanide, selenium, aluminum, and iron is required in this Order per CWC section 13263.3(d)(1)(D). The PPP shall be developed in conformance with CWC section 13263.3(d)(3) as outlined in subsection b., below.

b. **CWC section 13263.3(d)(3) Pollution Prevention Plans.** The pollution prevention plans required for cyanide, selenium, aluminum, and iron shall, at

minimum, meet the requirements outlined in CWC 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.

c. **Salinity Evaluation and Minimization Plan.** The WWTP effluent is high in salinity. To address sources of salinity from the wastewater treatment system, this Order requires the Discharger to prepare and implement a salinity evaluation and minimization plan.

d. **Salinity Reduction.** This Order requires the Discharger to provide annual progress reports demonstrating progress towards the reduction of salinity discharged to the receiving waters. The salinity of the discharge needs to be protective of the agricultural beneficial uses of the Willow Slough Bypass and Conaway Ranch Toe Drain and the agricultural and municipal beneficial uses of the underlying groundwater. The salinity in the discharge exceeds the

agricultural screening value of 700 umhos/cm and the secondary Maximum Contaminant Level of 900 umhos/cm (for protection of the groundwater's municipal beneficial use). Groundwater monitoring results indicate degradation of the groundwater due to salinity. To comply with the limitations in this Order, the Discharger will need to continue to evaluate measures to reduce salinity in its discharge.

e. **Dioxin Congeners Evaluation and Minimization Plan.** An Evaluation and Minimization Plan for detected dioxin-like congeners is required in this Order to ensure adequate measures are developed and implemented by the Discharger to reduce the discharge of dioxin-like congeners to the receiving water.

4. Construction, Operation, and Maintenance Specifications

a. **Treatment Pond Operating Requirements**. This Order requires the Discharger to maintain the ponds to protect public health and prevent nuisance.

5. Special Provisions for Municipal Facilities (POTWs Only)

a. **Pretreatment Requirements**

i. The Federal Clean Water Act, 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 Regional Water Board, the State Water Board or the USEPA may take enforcement actions against the Discharger as authorized by the CWA.

6. Compliance Schedules

The use and location of compliances schedules in the permit depends on the Discharger's ability to comply and the source of the applied water quality criteria.

a. The Discharger submitted a request and technical justification (dated 22 January 2006 and 30 January 2007) for time schedules to comply with cyanide and selenium effluent limitations. The compliance schedule justification included all items specified in Paragraph 3, items (a) through (d), of section 2.1 of the SIP. This Order establishes a compliance schedule for the new, final, water quality-based effluent limitations for cyanide, and selenium, and requires full compliance by 18 May 2010.

b. The Discharger submitted a request, and justification (dated 22 January 2007), for a compliance schedule for BOD, TSS, turbidity, coliform, aluminum, ammonia, and iron. The compliance schedule justification included all items specified in Paragraph 3, items (a) through (d), of section 2.1 of the SIP. The Discharger submitted a subsequent request on 24 October 2008 to extend the compliance schedule by two years to allow for the development and consideration of studies to determine the feasibility of reusing treated effluent on the Conaway Ranch and eliminating its surface water discharge. The Discharger has provided documentation that indicates both the Discharger and the owners of the Conaway Ranch, Conaway Preservation Group, are committed to conducting necessary studies and negotiating necessary agreements to pursue the viability of reusing all of the Dischargers treated effluent for agricultural reuse on the Conaway Ranch property. At anytime during the two-year period, should the Discharger determine that reuse is not feasible, the Discharger must immediately continue its efforts to upgrade the existing treatment facility. This Order establishes a compliance schedule for the new, final, water quality-based effluent limitations for BOD, TSS, turbidity, coliform, aluminum, ammonia, and iron and requires full compliance by 25 October 2017.

VIII. PUBLIC PARTICIPATION

The California Regional Water Quality Control Board, Central Valley Region (Regional Water Board) is considering the issuance of waste discharge requirements (WDRs) that will serve as a National Pollutant Discharge Elimination System (NPDES) permit for the City of Davis. As a step in the WDR adoption process, the Regional Water Board staff has developed tentative WDRs. The Regional Water Board encourages public participation in the WDR adoption process.

A. Notification of Interested Parties

The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Notification was provided through publication of a Notice of Public Hearing in a local newspaper and on the Central Valley Regional Water Board website.

B. Written Comments

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

To be fully responded to by staff and considered by the Regional Water Board, written comments should be received at the Regional Water Board offices by ~~12~~5:00 p.m. ~~(noon)~~ on ~~4 October 2007~~2 August 2010.

C. Public Hearing

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

Date: ~~5/6 February 2009~~ 22/23/24 September 2010
Time: 8:30 am
Location: Regional Water Quality Control Board, Central Valley Region
11020 Sun Center Dr., Suite #200
Rancho Cordova, CA 95670

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

Please be aware that dates and venues may change. Our Web address is http://www.waterboards.ca.gov/rwqcb5/ where you can access the current agenda for changes in dates and locations.

D. Waste Discharge Requirements Petitions

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

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

E. Information and Copying

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

F. Register of Interested Persons

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

G. Additional Information

Requests for additional information or questions regarding this Order should be directed to Joshua Palmer at (916) 464-4674 or jpalmer@waterboards.ca.gov.