

**Regional Water Quality Control Board
Central Valley Region Board Meeting
8/9 December 2022**

**Response to Written Comments for the
City of Madera
Madera Wastewater Treatment Facility
Madera County
Tentative Waste Discharge Requirements**

At a public hearing scheduled for 8/9 December 2022, the Regional Water Quality Control Board, Central Valley Region, (Central Valley Water Board) will consider adoption of revised Waste Discharge Requirements for the City of Madera (referred to as Discharger or City) for discharge of undisinfected secondary treated municipal wastewater from the Madera Wastewater Treatment Facility (WWTF or Facility) to adjacent land of up to 7 million gallons per day (mgd). The tentative order proposes to revise the Facility's current waste discharge requirements (Order 95-046). This document contains Central Valley Water Board staff's responses to written comments received from interested persons regarding the tentative Waste Discharge Requirements (TWDRs) circulated on 27 September 2022. Written comments were required by public notice to be received by the Central Valley Water Board by 27 October 2022 to receive full consideration. Central Valley Water Board staff received comments from Ms. JoAnne Kipps regarding the TWDRs in a 27 October 2022 letter. Ms. Kipps then submitted an additional comment via email on 28 October 2022. In addition, Central Valley Water Board staff received late comments from the City of Madera on 3 November 2022.

Written comments are summarized below, followed by responses from Central Valley Water Board staff. In addition, staff has made a few minor changes to the TWDRs to improve clarity and fix typographical errors.

MS. KIPPS – 27/28 OCTOBER 2022 COMMENTS

KIPPS COMMENT #1: Ms. Kipps contends that the TWDRs lacks sufficient depth and does not stress the potential impact the discharge has had on groundwater. Ms. Kipps states that Finding 34 of the TWDRs summarizes limited available data for salinity and nitrate for groundwater passing under and beyond effluent disposal ponds but does not attribute them to the discharge due to the apparent lack of recent data on upgradient groundwater conditions. The finding concludes, "Therefore, it is unclear if the elevated nitrate and salinity contributions are the result of the Facility's discharge or surrounding activities (e.g., farming)."

Ms. Kipps contends that the discharge's hydraulic loading (over 60 feet/year) represents a major source of groundwater recharge. Groundwater passing through shallow monitoring wells immediately adjacent to the ponds is dominated by percolated effluent and likely contains waste constituents derived from past sludge discharges. While farming is a significant non-point source of salinity and nitrate in groundwater, there is sufficient evidence to attribute the apparent salinity and nitrate degradation of groundwater to the Facility's effluent disposal operation. Please revise the TWDRs to acknowledge: (1) the Discharger's effluent disposal operation is largely responsible for the elevated levels of waste constituents in shallow groundwater beneath and immediately downgradient of ponds; and (2) additional sources of waste constituents include the Discharger's past practices of reclaiming effluent on crops

grown in ponds, applying Facility sludge to ponds for use as a soil amendment, and, because it lacked sufficient sludge dewatering capacity, discharging digested sludge directly to ponds, even when in service for effluent disposal.

RESPONSE: Concerning Ms. Kipps' comment that the Facility's discharge is "the major contributor to the elevated salinity and nitrate concentrations," Staff recognize that the Facility's discharge, by volume alone, can have a significant impact on underlying groundwater. However, one of the primary issues in determining the Facility's discharge impact on underlying groundwater is the lack of consistent active groundwater monitoring wells, especially upgradient of the Facility. The TWDRs include various requirements to address this, including the installation of additional monitoring wells and an expanded list of constituents to monitor for in groundwater. Once additional groundwater data is collected, the TWDRs require the Discharger to conduct a Treatment Evaluation Workplan (Provision J.6) if the groundwater data shows (as required by the Groundwater Quality Study Report; Provision J.5) that the Facility's discharge is causing groundwater to contain waste constituent in concentrations statistically greater than background water quality.

Furthermore, these TWDRs establish a total nitrogen effluent limitation to ensure the Facility's discharge does not cause or contribute to an exceedance of the nitrate Maximum Contaminant Level (MCL) and requires the Discharger to continue to comply with the Salt Control Program by participating in the Prioritization and Optimization Study as well as comply with the Salinity Action Level.

The only consistent active groundwater monitoring well for the Facility is MW-01. During the period of January 2015 to December 2018 monitoring wells MW-02 through MW-08 were not sampled due to dry conditions (MW-02 was damaged due to farming operations and cannot be located). During the period of January 2019 to December 2021, monitoring wells MW-04, and MW-05 were dry. MW-03 was dry in 2020 and 2021. As noted in the TWDRs Information Sheet, salinity and nitrate concentrations have significantly increased over the past few years. However, it is unclear to Central Valley Water Board staff how much the Facility's operations and discharge contribute to this increase. The available recent groundwater monitoring data for salinity and nitrogen does show elevated concentrations, but the groundwater concentrations are generally significantly higher than the Facility's effluent concentrations. As shown in Table 7 of the TWDRs, available groundwater total dissolved solids (TDS) concentrations are about 600 to 700 mg/L and nitrate (as N) concentrations are about 7 mg/L to 15 mg/L. As shown in Table 4 and Table 3, the Facility's effluent is about 350 to 370 mg/L for TDS and generally below 10 mg/L for total nitrogen (excluding 2019, 2021, and Q1 of 2022). Therefore, there is some uncertainty of the extent of the Facility's contribution to these elevated concentrations, especially without adequately characterizing upgradient concentrations.

Staff concurs that the Facility's discharge can have some impacts on groundwater conditions within the area. The Facility's effluent generally has effluent concentrations below the concentrations of underlying groundwater. Staff has updated Finding 7, 8, 9 and the Information Sheet, to discuss historic sludge disposal practices as well as the previous reclamation that occurred within the ponds and how the Discharger has

switched from the historical use of sludge drying beds to skid mounted drying beds where the dewatered cake is hauled off-site.

Finding 9 has been updated to state that the Facility's previous discharge activities could be at least partially responsible for some of the elevated concentrations in groundwater. The limited recent available groundwater monitoring data is of similar concentrations to historic upgradient groundwater monitoring concentrations and reported nearby wells. The TWDRs require the City to install additional monitoring wells and complete a characterization of upgradient and downgradient conditions to determine if the Facility's discharge is statistically increasing groundwater concentrations.

KIPPS COMMENT #2: Ms. Kipps provides comments regarding Finding 6 which designates Pond 9S as the fifteenth evaporation/percolation pond and references ATTACHMENT A – SITE LOCATION MAP which designates Pond 9S as "(Not in use)". Furthermore, Ms. Kipps notes that WDRs Order 95-046 states the Facility had 280 acres not 320 acres as stated in Finding 6 of the TWDRs and requests the discrepancy be corrected and that the TWDRs clarify how the Facility now has 320 acres of disposal ponds.

RESPONSE: Staff revised the TWDRs to update Attachment A to remove "(Not in use)" from Pond 9S. City staff clarified that Pond 9S is only utilized when subsequent evaporation/percolation ponds are full. A valve will open under pressure and effluent will gravity flow to Pond 9S. According to City staff, Pond 9S is approximately 40 acres. Finding 18 was revised to reflect this information.

KIPPS COMMENT #3: Please revise the TWDRs to characterize the Discharger's past, current, and anticipated effluent disposal operations. At a minimum, please identify how many ponds are currently used at any one time and what criteria is used to decide which ponds are rotated in and out of service for effluent disposal and include estimates of annual hydraulic loading rates at current and maximum authorized discharge flows.

RESPONSE: Finding 18 was modified to characterize the Discharger's past, current, and anticipated effluent disposal operations. The TWDRs Findings were updated to note the number of ponds typically in use according to Google Earth. TWDRs (Provision J.7) requires the City to evaluate potential future disposal options, specifically reclamation. City staff have indicated in conversations with Central Valley Water Board staff intent to pursue disinfected tertiary treatment and reclamation options, if possible, by 2 January 2025.

KIPPS COMMENT #4: Please confer with the Discharger to obtain an explanation for what appears to be an unusual discharge to Pond 1S in three consecutive Google Earth images taken in 2017 and 2018 (3/21/2017, 8/7/2017, and 2/16/2018). If possible, please include an explanation for this unusual discharge in the Response to Comments.

RESPONSE: As documented in a letter from the City on 8 March 2017 and their March 2017 self-monitoring report (13 April 2017), the discharge to Pond 1S in the Google Earth images taken in 2017 and 2018 were due to the cleaning of digester number one.

KIPPS COMMENT #5: Finding 6 lists Facility operations identified in Finding 3 of Current Order, but omits Finding 3's inclusion of "four sludge drying beds".

RESPONSE: Finding 6 has been modified as follows:

6. WDRs Order 95-046 was adopted...and two anaerobic sludge digesters (in parallel)-and four sludge drying beds.

KIPPS COMMENT #6: Finding 7 mentions installation of a "second centrifuge." However, the TWDRs does not mention a first centrifuge. Please identify when the first centrifuge was installed.

RESPONSE: The following language was added in Finding 9:

In February 2004, the City replaced the sludge drying beds with a skid-mounted centrifuge, a second centrifuge was added between 2005 and 2007.

KIPPS COMMENT #7: Finding 15 lists the Facility wastewater and sludge treatment operations. Please revise the finding to indicate that each operation is a fully enclosed facility (e.g., tanks, concrete-lined facilities of limited areal extent) and maintained in a manner that ensures compliance with the TWDRs, especially Discharge Prohibitions B.2.a and B.2.b.

RESPONSE: Staff revised Finding 18 of the TWDRs to indicate that each operation is a fully enclosed facility.

KIPPS COMMENT #8: Finding 16 discusses the Discharger's current sludge operations. The TWDRs should clarify which RWD discussed the sludge handling operations and when they were implemented, in addition the TWDRs should discuss 2001 Cleanup and Abatement Order the Dischargers treatment and disposal practices and the extent to which this may pose on-going threat to groundwater.

RESPONSE: Staff revised Findings 7, 8, and 9 to identify when the Discharger fully initiated its current sludge treatment and disposal operations, discussed the Cleanup and Abatement Order (CAO), and states that historical disposal practices could have resulted in potential impacts to underlying groundwater.

KIPPS COMMENT #9: Finding 19 appears to incorrectly refer to the Discharger's RWD submitted on 23 May 2019 as the "August 2019 RWD."

RESPONSE: Staff made the correction to Finding 19 which has now been renumbered to Finding 22.

KIPPS COMMENT #10: Finding 23 concerns the Discharger's Industrial Pretreatment Program and states, in part, that the "Central Valley Water Board finds this program is adequate to meet the Facility's needs." The Discharger's pretreatment program was inspected in 2011 and 2021, according to information in the California Integrated Water Quality System (CIWQS). CIWQS posts the 2011 pretreatment inspection report (Pretreatment Compliance Inspection Summary Report, City of Madera, WDR Order No. 95-046, Madera County. Inspected 25 April 2011 by I-Hsin Lee, Tetra Tech, Inc.). This report provides a summary of

program deficiencies and recommendations. CIWQS does not post the 2021 pretreatment inspection report, which may have described corrective measures taken by the Discharger to address the deficiencies identified in 2011. Please revise the TWDRs to include a brief summary of the Discharger's progress in addressing the program deficiencies identified in 2011, and identify any additional deficiencies observed in 2021.

RESPONSE: The City responded to the 2011 pretreatment inspection in a letter dated 15 December 2011 that was sent to the State Water Resources Control Board. In response, the City amended the significant non-compliance definition on page 7 of the city ordinance, amended city ordinance to incorporate, record, and report Industrial User Best Management Practices, updated permit monitoring changes for Madera Powder Coating, implemented the use of a portable pH measuring device, added an additional slug discharge evaluation form and require industries to review current programs for slug control, and ensured reports were submitted in compliance with required certification statement.

The 2021 inspection was a pre-requirement inspection for permitting staff to become more familiar with the site before preparing revised WDRs, not a pretreatment inspection.

KIPPS COMMENT #11: Finding 31 indicates the Discharger's groundwater monitoring well network consists of eight wells and states, in part, that "MW-02 was lost/destroyed due to farming operations and can no longer be located by the Discharger." Because the word "destroyed" has a specific legal meaning when applied to groundwater wells, please consider revising to read: "MW-02 was lost/destroyed due to damage by farming operations and can no longer be located by the Discharger."

RESPONSE: Staff updated Finding 31 now Finding 34 to reflect the change.

KIPPS COMMENT #12: Finding 32 attributes receding groundwater levels to explain a three-year gap in groundwater monitoring data from 2017 to 2020 for all wells except MW-01, next to the southern boundary of Pond 9S. In 2021, groundwater levels rose sufficiently to allow for the collection of samples from four wells, all in close proximity to ponds. The Current Order's MRP requires groundwater monitoring to be performed monthly for total coliform organisms; quarterly for EC, pH, Standard Minerals, and Total Nitrogen; and semi-annually for metals. Table 7 in Finding 32 summarizes data obtained in 2021 for four wells for salinity and salinity constituents, nitrate and TKN, dissolved iron, dissolved manganese, and arsenic. Because of the history of sludge discharges to ponds, this finding should also include the 2021 semi-annual monitoring results for the other 11 trace metals required in the Current Order's MRP.

RESPONSE: Staff revised the information sheet to include the 2021 semi-annual monitoring results for the other 11 trace metals required in the Current Order's MRP, a majority of which were non-detect (ND).

KIPPS COMMENT #13: As mentioned earlier, the TWDRs cites receding groundwater levels for the Discharger's recent inability to sample most wells, including the sole upgradient well in the groundwater monitoring well network. Because the TWDRs does not evaluate data obtained prior to 2021, it effectively dismisses as irrelevant a large groundwater monitoring

data base assembled by the Discharger at, no doubt, considerable expense. The Facility is a major POTW, and its discharge operation represents a major contributor of waste constituents to groundwater. The TWDRs's groundwater characterization should be based on a larger sample of groundwater data, even if it is pockmarked by gaps. And, it should summarize monitoring results for trace metals (required semi-annually) because of the Discharger's past sludge management and disposal practices. In summary, the TWDRs's groundwater characterization is unusually superficial for a discharge of this size. Even if there are gaps in monitoring data, the TWDRs should include data obtained prior to 2021 and summarize evaluations of data trends. Please revise the TWDRs to present a more fulsome characterization of groundwater conditions.

RESPONSE: Staff reviewed available groundwater data from January 2017 to October 2021 when preparing the TWDRs. As noted in the TWDRs, only MW-1 had data consistently available for this period. The Information Sheet includes graphs of TDS and total nitrogen concentrations for MW-1 (Figure 4 and Figure 5) from 2017 to the 2nd Quarter of 2022. Both graphs show increasing concentrations over the past five years. However, the recent elevated nitrogen and TDS concentrations found in MW-1 greatly exceed the Facility's historic effluent concentrations.

Furthermore, in a 5 July 2012 letter from AM Consulting, Alfonso Manrique (RCE 63673) evaluates groundwater monitoring data from the Facility's groundwater monitoring wells in addition to nearby extraction wells, that were sampled on 12 June 2012. The following shows the results of the groundwater collected for select constituents.

Well Group	Chloride (mg/L)	EC (µmhos/cm)	TDS (mg/L)	Nitrate (as N) (mg/L)	Sulfate (mg/L as SO₄)
Onsite Extraction Wells	75-78	890-920	540-560	4-7.5	25-32
Onsite Monitoring Wells	69-81	560-940	370-610	1-21	14-38
Nearby Wells	4.2-120	140-1,100	140-670	2.5-10.1	3.6-31

Comparing the data summarized in the 5 July 2012 letter with the available 2021 groundwater monitoring data summarized in Table 7 of the TWDRs, it appears that the 2021 groundwater monitoring data is of similar concentrations (or lower) than the 2012 well data. The comparison of the groundwater data from 2012 compared to 2021 indicates the Facility's discharge hasn't caused further significant degradation in underlying groundwater (for nitrate and salinity) over the past 10 years. Staff added a summary of the data in the 5 July 2012 letter to the TWDRs information sheet.

With regards to recent metals monitoring data, staff added a summary of recent metals monitoring data to the Information Sheet. In general, most metal constituents are reported as non-detect.

KIPPS COMMENT #14: Finding 35 describes work underway to install new, deeper groundwater monitoring wells to replace wells that have gone dry. Please confirm whether the new upgradient monitoring well (MW-09) is adequately distant from the groundwater mound created by the discharge to be unaffected by percolated effluent. If appropriate, please consider requesting the Discharger to perform a groundwater mounding analysis to confirm whether the new upgradient well is placed sufficiently distant from the groundwater mound created by the discharge. Also, please confirm whether the network is sufficient to monitor groundwater affected by past sludge discharges to Pond 1S, as mentioned in the staff memorandum cited earlier.

RESPONSE: The Discharger has confirmed the proposed location of well MW-09 is outside of possible groundwater mounding impacts. The proposed location is of similar distance, if not further, than the previous MW-02 upgradient monitoring well. Since the Facility has addressed the improper sludge and solid disposal practices identified in the CAO, the current monitoring well network should provide sufficient information to monitor groundwater impacts from the operation of the Facility.

KIPPS COMMENT #15: Ms. Kipps provided additional comments regarding a 5-acre surface impoundment north of the Facility, the function of the impoundment, if it is used for stormwater disposal, and requests the revision of ATTACHMENT B – FACILITY MAP to include the impoundment and to revise ATTACHMENT C – FLOW SCHEMATIC to include centrate, digester supernatant, and/or stormwater. Additionally, Ms. Kipps references Finding 67, which states stormwater is sent directly to the headworks, and requests that staff confirm the accuracy of the statement.

RESPONSE: According to City staff, the 5-acre impoundment directly north of the Facility is an emergency pond, which also acts as a stormwater pond. City staff indicated that in case of emergency, the plant can be shut down and all of the raw wastewater can be sent to the unlined emergency pond and pumped back to the headworks when the system is operational again. If the primary effluent pumps fail, the primary effluent will also flow into the emergency holding pond. Central Valley Water Board staff have revised Finding 70 and ATTACHMENT B – FACILITY MAP to reflect stormwater flows. City staff confirmed the centrate is diverted back to the influent distribution box at the head of the plant, however, no digester supernatant is diverted back to the headworks. ATTACHMENT C – FLOW SCHEMATIC has been updated to reflect the updated information.

KIPPS COMMENT #16: Discharge Prohibitions B.4 and B.6 refer to “treatment ponds” and “evaporation/storage ponds.” Do the “treatment ponds” refer to the Facility’s oxidation ditches? If so, consider using the term, “oxidation ditches.” And, since elsewhere the TWDRs refers to effluent disposal ponds as “evaporation/percolation ponds,” this term should be used in Discharge Prohibition B.6.

RESPONSE: Staff have made the requested change.

KIPPS COMMENT #17: Ms. Kipps states that the TWDRs annual average effluent limitation for total nitrogen is not adequately protective of groundwater and requests to revise the effluent limitation from an annual average to a monthly average and require weekly monitoring for total nitrogen.

RESPONSE: Staff have updated the MRP to require weekly monitoring of effluent total nitrogen and updated the effluent limitation to a monthly average limit.

KIPPS COMMENT #18: *The current Order's MRP requires semi-annual groundwater monitoring for metals (aluminum, arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc). The TWDRs also requires semi-annual groundwater monitoring for most of these metals, with the exception of barium, chromium, lead, mercury, nickel, and selenium. Please provide a technical justification for removing these constituents from the suite of constituents monitored in groundwater wells.*

RESPONSE: Historical data collected under current order indicates, barium, chromium, lead, mercury, nickel, and selenium were non-detect or well below the maximum contaminant level; therefore, the constituents were removed from the list of groundwater monitoring in the TWDRs.

KIPPS COMMENT #19: Ms. Kipps provides comments on the MRP regarding the influent pH sample type and suggests adding quarterly groundwater monitoring for total organic carbon as it is useful to evaluate the extent to which discharge may cause anoxic conditions in groundwater. Ms. Kipps also states that it is typical to require influent and effluent BOD/TSS to be sampled on the same day.

RESPONSE: Staff have made the requested changes, which includes changing composite sampling for pH to a grab sample, adding total organic carbon monitoring to quarterly groundwater monitoring, and adding footnotes to require influent and effluent BOD/TSS be sampled on the same day.

CITY OF MADERA – 3 NOVEMBER 2022 COMMENTS

MADERA COMMENT #1: The City states the WWTF is not designed to remove salts and that a reverse osmosis (RO) treatment system would need to be installed to remove salinity and comply with the Salinity Action Level of 500 mg/L.

RESPONSE: The TWDRs include a Salinity Action Level of 500 mg/L as part of the Salt Control Program. The City selected Phase I (Alternative Salinity Permitting Approach) and joined the Prioritization and Optimization (P&O) Study for the Salt Control Program. As part of compliance with the Alternative Salinity Permitting Approach, the Salt Control Program requires dischargers to maintain current discharge concentrations for salt. Therefore, the 500 mg/L Salinity Action Level is included in the TWDRs and is a numeric value established to help ensure that the City is making its best efforts to maintain salinity levels in its discharge. If the Salinity Action level is exceeded, the City will be required to conduct additional investigations (e.g., Salinity Action Level Report) to determine the cause(s) for the rise in the effluent's salinity levels and potential impact to underlying groundwater.

The City's annual average TDS concentrations are summarized in Table 4 (Finding 23) of the TWDRs. The highest annual average TDS concentration from 2017 to 2021 was 373 mg/L. A 500 mg/L value was selected to provide some room for the City to implement conservation efforts, which could result in an increase in salinity concentrations. Therefore, based on available data, it appears City should be able to currently comply with the proposed Salinity Action Level of 500 mg/L for TDS and would not need to install a RO system at this time.

MADERA COMMENT #2: The City contends that the total coliform concentrations reported in previous years may be the result of the Facility's discharge (i.e., not sample/well contamination) and asks for more clarity on the requirement to disinfect the monitoring wells (Provision 3).

RESPONSE: Table 8 of the TWDRs summarize the reported total coliform detections in available monitoring wells for 2021. The TWDRs, Finding 61.c discusses staff's uncertainty of the accuracy of the total coliform concentrations due to the significant vadose zone (i.e., 100 to 120 feet) underneath the evaporation/percolation ponds. This vadose zone depth, depending on soils conditions, has historically been shown to provide sufficient bacteria removal before percolated undisinfecting domestic wastewater reaches groundwater to comply with the Basin Plan water quality objective of 2.2 most probable number (MPN) per 100 mL. For example, total coliform groundwater data summarized in the 2010 RWD shows that the groundwater data from January to December 2009 around the WWTF were generally less than or equal to 2.2 MPN/100 mL for total coliform. The purpose of the Groundwater Monitoring Well Disinfection Workplan and Sampling and Analysis Plan (TWDRs, Provision J.3) is to eliminate the potential for cross-contamination (i.e., conducting wastewater and groundwater monitoring sampling) as well as to disinfect the existing monitoring wells to ensure the total coliform sampling results accurately reflect the underlying groundwater conditions. If, after the City implements the sampling and analysis plan and disinfects the monitoring wells, the groundwater monitoring data shows regular total coliform detections, the City will need to investigate adding disinfection to the WWTF treatment system to ensure protection of the groundwater quality and meeting the bacteria water quality objective mentioned above.

The TWDRs do not specify exactly how the City should conduct the monitoring well disinfection. Rather, the TWDRs require the City to propose how it will disinfect the monitoring wells. The Work Plan would need to be prepared by the appropriately licensed registered professional who has experience conducting this work. Once submitted, Central Valley Water Board staff would review the work plan to determine if it is complete or if there are any inadequacies with the submittal before the City completes the proposed disinfection of the monitoring well.

MADERA COMMENT #3: *The City summarizes recent pH concentrations in some of the evaporation/percolation ponds, specifically during the summer months. The City inquires*

whether the application of copper sulfide could be used to control algae (potential cause for the high pH concentrations) within the evaporation/percolation ponds.

RESPONSE: Neither the TWDRs, nor staff, can dictate the manner of compliance. Therefore, the City can make the necessary operational changes to limit algae growth within the evaporation/percolation ponds provided the changes comply with the WDRs. If the City intends to add a chemical to the ponds (e.g., copper sulfide), the City should provide a technical report on how the proposed change will address the algae problem and the potential impacts the chemical addition will have on the Facility's effluent quality (as well as underlying groundwater).