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### **Linda County Water District WWTP, Tentative WDRs Comments**

This letter transmits my comments on the Tentative WDRs and NPDES Permit renewal for the Linda County Water District Wastewater Treatment Plant dated 3 October 2022 (Tentative Order). WDRs Order R5-2017-0094-01 currently regulates the Facility and its discharge of tertiary treated wastewater to five evaporation/percolation ponds within the Feather River floodplain or to a rarely used outfall to the Feather River. The Tentative Order proposes to rescind and replace the Current Order.

I am a California registered civil engineer and resident of Fresno County. From 1998 to 2010, I was employed by the Central Valley Regional Water Quality Control Board, mostly in the WDR Program, performing then supervising work associated with waste discharges to land from industrial and municipal facilities within the Fresno office jurisdiction.

***The Current Order.*** The Current Order establishes a discharge prohibition to limit the combined average dry weather flow from both discharge points to five million gallons per day (MGD). It authorizes an increase in discharge flow to 6.7 MGD upon the Discharger's completion of a Facility upgrade and expansion project and compliance with a special provision. It characterizes the Facility's groundwater monitoring well network as comprised of one upgradient well (MW-1), located west of the treatment works and about 550 feet east of the ponds, and two downgradient wells adjacent to the ponds' western border: MW-2, about 400 feet from the Feather River, and MW-3, about 120 feet from the river. It requires semi-annual monitoring of groundwater for depth, pH, EC, Fecal Coliform, and Total Nitrogen.

The Current Order's Fact Sheet (F-14) characterizes iron and manganese concentrations in the discharge as below the water quality objectives, and in groundwater, many times the objectives. Because of this, it concludes, the discharge from the percolation ponds to groundwater "does not contribute to the increase of constituent concentrations in the groundwater" and is "in compliance with the Basin Plan" and, therefore, qualifies for an exemption from Title 27 pursuant to Title 27 CCR section 20090(b).

The Current Order does not appear to discuss or explain the apparent increase in manganese in groundwater in MW-2 compared to background. It does not consider that the discharge, although containing low concentrations of BOD and TSS, nevertheless contains

sufficient nitrogen to encourage algae growth in ponds (seen clearly in Google Earth historic imagery). The decomposition of dead algae exerts an organic load to pond bottom soils. It has long been recognized in the WDR Program that organic loading typically increases groundwater alkalinity and hardness and, when excessive, can lead to anoxic conditions that denitrify nitrate and mobilize soil iron, manganese, and arsenic.

The Current Order requires the Discharger to submit various studies involving groundwater: Groundwater Dilution Verification Study, Groundwater Well Relocation Study, and Groundwater Quality Study.

***The Tentative Order.*** The Tentative Order carries over the Current Order's average dry weather discharge flow limitation of 5 MGD, and defers authorizing the flow increase to 6.7 MGD through a reopener provision. Current Facility average dry weather influent flows are 2.6 MGD.

Below are my main concerns and recommendations, followed by specific comments and recommendations.

***WDR Program discharge regulated in the NPDES Program.*** The Tentative Order indicates that no direct surface water discharges occurred since the Current Order was adopted in 2017. The Discharger relies on the pond discharge for effluent disposal in most years. For this reason, the Facility and its discharge to the ponds should be regulated under the WDR Program and the Facility's infrequent discharges via the river outfall or as a result of floodwaters overtopping the pond levees should be regulated under the NPDES Program.

Why? Because WDRs for land discharges, especially existing discharges from large publicly owned treatment works (POTWs), typically include supporting evidence to document the potential for the treatment facility and its waste discharges to adversely impact groundwater. This usually requires numerous findings characterizing: the discharge for waste constituents that may be released to groundwater; soils in the discharge area; and the depth, gradient, and quality of groundwater potentially affected by the discharge. Where organic overloading is a concern, the WDRs typically disclose its potential to unreasonably degrade groundwater. The WDRs also invariably itemize the discharger's best practicable treatment or control measures implemented at the facility to minimize groundwater degradation and protect its designated beneficial uses.

The lion's share of the 167-page Tentative Order pertains to the infrequent direct surface water discharge and implementation of federal and state laws, regulations, and policies pertaining to discharges of pollutants to surface waters of the United States. Only a small portion of the Tentative Order discusses the potential groundwater impacts from discharges of wastes within the treatment works area (e.g., sludge drying beds and lagoons) and the discharge of tertiary treated wastewater to unlined ponds within the Feather River floodplain.

An example of the Tentative Order's inadequate characterization of groundwater affected by the pond discharge is its use of data from only one sampling event (Table F-6). Recall that the Current Order requires semi-annual groundwater, so there should be data from at least eight sampling events by now that staff could have used to characterize groundwater. Please revise the Tentative Order to characterize groundwater using data collected from at least eight semi-annual sampling events.

The Tentative Order also does not appear to describe the results of the groundwater studies required by the Current Order. These studies include analyzing the groundwater gradient and whether discharges to percolation ponds are impacting groundwater quality. Since the Discharger relies on the percolation ponds in most years for effluent disposal, the Tentative Order should be revised to include a summary of these studies.

In reviewing the Discharger's monitoring results electronically submitted since 2017, I found several instances in which the Discharger uploaded a 23 June 2011 technical memorandum from Kennedy/Jenks Consultants. This memorandum discusses the difficulties in determining groundwater gradient from the current monitoring well network:

The three (3) monitoring wells around the District's ponds are placed in locations that do not yield an accurate calculation of groundwater gradient away from the ponds. The wells are placed to the east, west and southwest corners of the ponds with no two wells configured in such a manner that the difference in measured groundwater elevations within the wells would yield a meaningful gradient calculation.

The groundwater gradient at the pond system is much more affected by the fluctuating Feather River water level and the current use of the disposal ponds as their use generally leaves some of the ponds empty and dry for routine maintenance while the effluent is discharged to other ponds within the District's seven (7) pond configuration. Groundwater gradient could be calculated using disposal pond elevation or the elevation of the Feather River to allow two aligned points for a gradient calculation on a radian leading away from the disposal ponds. However, these elevations can change significantly in a relatively short period of time and it is unlikely that the gradient calculations based on these fluctuating points would remain accurate or useful over time.

Also, as I will discuss further below, both the Current Order and Tentative Order display an apparent lack of understanding of how discharges of wastewater and sludge to land may impact groundwater. WDR Program staff are typically well versed about these impacts – namely, that organic loading tends to increase groundwater alkalinity and hardness; depletes soil oxygen and, in so doing, fosters denitrification and mobilizes soil metals such as iron, manganese, and arsenic. In contrast, NPDES Program staff tend to dismiss a land discharge's potential to contribute to existing conditions of elevated iron and manganese in groundwater (e.g., recent-adopted WDRs / NPDES Permit for the City of Chico).

I anticipate you will dismiss my recommendation to regulate the Facility and pond discharge under the WDR Program. However, it appears clear that there is a need for training of NPDES staff in how to characterize groundwater in general, and how to evaluate

a discharge's potential to impact groundwater in particular. This training is required for NPDES staff to provide the level of transparency needed in orders submitted for Board approval to fully characterize a discharge of waste to land. This includes disclosing the discharge's annual hydraulic loading under current and maximum authorized discharge flows to get a relative sense of the scale of the discharge's contribution to groundwater compared to other area land uses. It also includes characterizing the discharge for waste constituents in the discharge (e.g., chloride, sodium, disinfection byproducts), and also recognizing the potential for the discharge to release to groundwater waste constituents produced as a result of the decomposition of organic matter in the discharge itself or created by the discharge (e.g., algae growth in percolation ponds). Both the Current and Tentative Orders are inadequate with regards to identifying constituents to be monitored in groundwater to adequately evaluate the discharge's impacts to groundwater. Therefore, it would appear that NPDES staff also need training on what comprises an adequate groundwater monitoring program.

***Title 27 Exemption of Pond Discharge.*** Before delving into its analysis of the discharge's qualification for exemption from Title 27 pursuant to Title 27 CCR section 20090(b), the Tentative Order cites the Current Order's finding of the discharge's compliance the Basin Plan for reasons provided above. The Current Order focused on manganese, which is present in groundwater in concentrations exceeding the water quality objective. The Tentative Order focuses on total nitrogen, which occurs in the discharge and groundwater in concentrations generally below 10 mg/L, the water quality objective for nitrate as nitrogen. The Tentative Order finds the pond discharge is "not contributing to the degradation of groundwater quality with respect to ... electrical conductivity ... or total nitrogen" (F-14).

Yet, electrical conductivity (EC) is consistently and appreciably higher in downgradient groundwater compared to background. Semi-annual groundwater monitoring results submitted since 2019 show upgradient EC (MW-1) is below 250 umhos/cm over 70% of the time, whereas downgradient EC (MW-2 and MW-3) is above 600 umhos/cm over 60% of the time. The two sampling events in which background EC is greater than 250 umhos/cm appears to be associated with a period of high groundwater levels that may have resulted in effluent-dominated groundwater to spread towards MW-1. In light of this evidence, the Tentative Order appears to simply dismiss the apparent increase in EC in groundwater affected by the discharge.

The Tentative Order indicates that current average monthly dry weather flow is 2.6 MGD. The Facility's five percolation ponds occupy a combined total 30 acres. Google Earth imagery since 2020 show two to three ponds in use at any one time, suggesting, on average, 40% of total disposal area is used to dispose of flows since 2020. At current flow of 2.6 MGD, this amounts to a hydraulic loading rate of over 200 feet year! It safe to conclude that groundwater passing through monitoring wells immediately downgradient of the ponds is, in all but flood years, dominated by percolated effluent. Until it is demonstrated otherwise, the obvious contributor of the increase in groundwater salinity is the discharge and, as long recognized in the WDR Program, also to the decomposition by-products of

organics in the discharge itself and, in this case, from the decay of algae that proliferate in percolation ponds as currently operated.

Please revise the Tentative Order to recognize the discharge as a contributor to salinity degradation in groundwater and, as mentioned above, require groundwater monitoring to evaluate the extent to which the salinity degradation is due to the discharge alone (e.g., chloride, sodium) or also to waste constituents produced by the decomposition of organic matter in the soil and groundwater (alkalinity and hardness; dissolved iron, manganese, and arsenic).

To provide data necessary to evaluate the extent to which the pond discharge is causing excessive organic loading to groundwater and exacerbating an existing condition of iron and manganese pollution in groundwater, the Tentative Order should require groundwater monitoring for total organic carbon. And, to provide data necessary to adequately characterize the mineral quality of groundwater, the Tentative Order should require groundwater monitoring for general minerals (alkalinity (as CaCO<sub>3</sub>), bicarbonate (as CaCO<sub>3</sub>), boron, calcium, chloride, iron, magnesium, manganese, nitrate as N, phosphate, potassium, sodium, sulfate, total dissolved solids, hardness (as CaCO<sub>3</sub>), and verification that the analysis is complete (i.e., cation/anion balance). Lastly, because of the use of chlorine for disinfection, groundwater should also be monitored for total trihalomethanes.

Also, most WDRs for major POTWs with significant land discharges require quarterly groundwater monitoring. This allows for the timely collection of sufficient data for evaluating a discharge's impact on groundwater. Since the Facility is a major POTW that relies almost exclusively on groundwater for effluent disposal, please increase groundwater monitoring frequency to quarterly and, as appropriate, include language authorizing a reduced frequency to semi-annual following Executive Officer approval of a Discharger request supported by documentation that data generated from a reduced frequency is comparable to that collected quarterly (e.g., data ranges, averages, standard deviations).

Finally, please address the issue of groundwater gradient determination from the current well network described in the 2011 technical memorandum. And, consider revising the Tentative Order to require the Discharger to evaluate the adequacy of the current monitoring well network for determining groundwater gradient.

***Title 27 Exemption of Discharges from Treatment Works.*** Many of the expanded Facility's operations occur in fully-enclosed units, such as tanks, or in concrete-lined facilities of limited areal extent. Other Facility operations include two 0.6-acre sludge lagoons, eight sludge drying beds (about 1.5 acres combined), and a 5,000-sf biosolids storage area located about 100 feet away from the Facility's open-air chlorine contact basins. Also, Facility operations will include a 3-acre equalization and sludge storage basin immediately east of the sludge lagoons.

The Tentative Order's Sludge/Biosolids Treatment or Discharge Specifications (VI. C.5.b.i) states, in part, that:

The treatment of sludge generated at the Facility shall be confined to the Facility property and conducted in a manner that precludes infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitations in section V.B. of this Order. In addition, the storage of residual sludge, solid waste, and biosolids on Facility property shall be temporary and controlled, and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitations included in section V.B. of this Order.

Anaerobic digester sludge and the leachate from sludge dewatering operations are high-strength wastes that, under most discharge situations, qualify for classification as designated waste pursuant to Title 27, section 20120. Were it not for their association with a municipal wastewater treatment plant, these wastes would require containment pursuant to Title 27 prescriptive standards. The Tentative Order requires sludge treatment "preclude infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitations in section V.B of this Order" (VI.C.5.b.i). However, it provides no evidence regarding the Discharger's ability to comply with this requirement. And, it requires no monitoring of groundwater passing under the sludge operations to verify the effectiveness of the provided containment to protect groundwater.

Please revise the Tentative Order to supply this evidence. Specifically, include a thorough description of the containment provided to the Facility's two sludge lagoons, eight sludge drying beds, and the new equalization and sludge storage basin. If the containment provided each does not comply with Title 27 prescriptive standards, justify why the Board should authorize groundwater degradation from waste constituents potentially released as a result of less stringent containment.

Also, please revise the Tentative Order to require monitoring of groundwater upgradient and immediately downgradient from the Facility's sludge operations. This will require the installation of at least three new monitoring wells. And, revise it to also require monitoring of groundwater for constituents already specified (EC, total nitrogen) and for those mentioned above, along with metals typically associated with municipal sewage sludge (i.e., aluminum, arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, selenium, silver, and zinc.)

And, given that the Facility is within 350 feet of residential areas, please characterize prevailing wind conditions and disclose any complaints received of nuisance odors created by the Facility's wastewater and sludge treatment operations. Lastly, please evaluate whether the proximity of the Facility's biosolids storage area to the open-air chlorine contact basins poses a threat of contamination by windborne biosolids contaminants to effluent undergoing chlorination.

**Stormwater Discharges.** The Tentative Order states, in part, that: "The Discharger has submitted a Notice of Intent (NOI) and been approved for coverage under the State Water

Board's Industrial Storm Water General Order. Therefore, this Order does not regulate storm water." [F-13 to F14].

According to information available from the California Integrated Water Quality System's Storm Water Multiple Application and Report Tracking System (SMARTS), the Discharger's NOI for coverage under WQ Order 2014-0057-DWQ displays the NOI status as "Terminated." It also shows a discharge point as Latitude 39.101657 Longitude - 121.586031, which is about 200 feet northwest of the northern sludge lagoon and over 2,500 feet from the Feather River. It identifies the receiving water as the Bear River, which is tributary to the Feather River about ten miles south of the Facility. Please confirm the Discharger's status with respect to its coverage under WQ Order 2014-0057-DWQ.

Additionally, even if the Discharger has coverage under WQ Order 2014-0057-DWQ, this order does not specifically address nuisance conditions and groundwater quality impacts that may occur from the improper operation and management of stormwater detention basins. The Facility Map shown in the Tentative Order's Attachment B shows several stormwater detention basins within the treatment works area. A Google Earth image taken 8/22/2016 shows vegetation taking root in the stormwater detention basin between the primary clarifiers and sludge drying beds. Subsequent images show the vegetation in this basin increasing the size and extent. Stormwater discharges to this vegetated basin has the potential for creating mosquito breeding habitat.

Please revise the Tentative Order to characterize the Facility's stormwater collection, detention, and disposal operations. In the event that the Discharger does not have coverage under WQ Order 2014-0057-DWQ, include information confirming that the Facility's existing network of detention basins has sufficient capacity to accommodate anticipated Facility stormwater flows.

To ensure the Discharger operates and maintains the Facility's stormwater detention basins in a manner that precludes violations of groundwater limitations and creation of conditions conducive for mosquito breeding, the Tentative Order should be revised to include a new Construction, Operation and Maintenance Specification to prescribe Stormwater Detention Basin Operating Requirements. For example:

1. The discharge of Facility stormwater to detention basins shall not cause or contribute to cause violations of groundwater limitations included in section V.B. of this Order.
2. Stormwater detention basins 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) Vegetation shall be minimized.
  - (c) Dead algae, vegetation, and debris shall not accumulate on the water surface.

***Specific Comments and Recommendations.*** The Tentative Order does not disclose the proximity to the Facility's ponds of effluent disposal ponds associated with the City of Yuba's wastewater treatment plant. This disclosure is appropriate as groundwater affected by the Facility's discharge is also affected by Yuba's discharge. Please revise the Tentative Order to provide a brief summary of Yuba's discharge to ponds within the Feather River floodplain.

The Tentative Order does not disclose the Facility's current annual biosolids production. Please revise to cite the Facility's current biosolids production rate (dry metric tons/year).

And, major POTWs typically employ mechanical dewatering of anaerobic digester sludge. In contrast, the Facility has two sludge lagoons, eight sludge drying beds, and will soon have an equalization and sludge storage basin. Please revise the Tentative Order to include a description of how the Discharger plans to utilize the equalization and sludge storage basin. And, describe how the Discharger operates these sludge facilities in a manner that precludes nuisance odors.

The Tentative Order's Attachment C—Flow Schematic is much simplified compared to the Current Order's detailed and almost illegible flow schematic. While the simplification improves readability, it appears to have resulted in the inadequate depiction of Facility flows in and out of its various unit operations. For example, it shows only the flow from the headworks to the equalization and sludge storage basin. Also, it does not depict the flow of high-strength waste streams, namely anaerobic digester supernatant and sludge drying bed leachate and centrate. Please revise Attachment C—Flow Schematic to adequately characterize all the Facility's major waste stream flows.

The Tentative Order's Attachment D—Groundwater Monitoring Wells (incorrectly identified as Attachment C) shows seven ponds (1, 2, 3, 4A, 4B, 5, and 6). Google Earth images of the ponds taken in 2020 and later show the removal of internal pond levees that once separated Ponds 4A and 4B and Ponds 5 and 6. Please revise Attachment D to depict the current configuration and labeling of percolation ponds.

In the Tentative Order's Fact Sheet, page 79, 1<sup>st</sup> paragraph, the following sentence appears twice: 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. Also, search for "peculation" ponds (F-16) and correct spelling.

Thank you for the opportunity to submit these comments.



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