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TENTATIVE WASTE DISCHARGE REQUIREMENTS ORDER AND MASTER RECYCLING PERMIT FOR CITY OF TULARE WASTEWATER TREATMENT FACILITY, TULARE COUNTY

This letter transmits my comments on the subject Tentative WDRs and Tentative Special Order Rescinding Cease and Desist Order R5-2002-0186 for the City of Tulare WWTF. I am a resident of Fresno County and a California registered civil engineer with experience in water quality control regulation and evaluating the effects to groundwater from discharges of waste to land by municipal wastewater treatment facilities. While I was employed at the Fresno Office of the Central Valley Regional Water Quality Control Board from February 1998 through December 2010, I was personally involved in staff's preparation of two tentative orders that the Board adopted in 2002 for the City of Tulare (i.e., Waste Discharge Requirements Order R5-2002-0185 and Cease and Desist Order R5-2002-0186). I reviewed the tentative orders and offer several recommendations in the hope that staff will revise them accordingly, or provide justification in its *Response To Comments* why staff believes the changes are not warranted.

Finding 6 describes the Domestic Plant components as including sludge drying, but does not identify the acreage dedicated to sludge drying, as done in Finding 20 for the Industrial Plant.

> **Recommendation 1:** Revise Finding 6 to identify the number of acres dedicated to drying Domestic Plant sludge.

Finding 20 lists the Industrial Plant components as including five aerated basins. Are these the same treatment units identified as "Pretreatment Lagoons" in the Industrial Plant Process Flow Diagram presented as Attachment D?

> **Recommendation 2:** Revise Finding 20 and Attachment D as appropriate to use the same label for these treatment units and describe them in sufficient detail (either in Finding 20 or in a new finding) to demonstrate that they are constructed in a manner that minimizes leachate formation and precludes the infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitations.

The Tentative WDRs contain information indicating that the City's past waste treatment and disposal practices have caused groundwater pollution for nitrate and other waste constituents. Findings 64 to 69 concern the City's treatment of Domestic Plant and Industrial Plant sludge and disposal of resulting biosolids. Historically, the City dewatered sludge in unlined beds, a practice that contributed to the pollution of underlying groundwater. Other similarly situated municipalities (e.g., City of Madera, City of Reedley) employ mechanical sludge dewatering,

which essentially precludes the release of sludge waste constituents to soil, reflects best practicable control, and and exemplifies consistency with the State's Antidegradation Policy. Rather than implementing mechanical sludge dewatering when it expanded the WWTF, the City constructed new soil cement-lined sludge drying beds to reduce the amount of sludge waste constituents released to soil during drying operations.

Staff's reluctance to accept the City's argument that sludge drying in soil cement-lined beds will not exacerbate an existing condition of groundwater pollution prompted the City to submit the technical report cited in Finding 65 (*Soil-Cement Lining of Sludge Drying Beds Best Practicable Treatment and Control for Solar Drying of Municipal Wastewater Sludge*). Finding 65 states, "Central Valley Water Board staff provisionally accepted the report's premise that soil cement may be considered an acceptable technology to line remote sludge drying beds." I am familiar with this report and with staff's response (or rather, lack thereof) and recommend the Board identify in the finding the date and form (written or verbal) of this provisional acceptance.

> **Recommendation 3.** Revise Finding 65 to identify the date of staff's response and indicate whether the provisional acceptance was written or verbal.

Finding 67 describes the City's construction of the Domestic Plant's sludge drying beds. The finding should also describe the City's demonstration soil cement-lined sludge drying bed, which was constructed in manner similar to the drying beds for both the Domestic and Industrial Plants, but equipped with a liner and leachate collection system. To my knowledge, the City (or more specifically, the City's engineering consulting firm that advocated the City's use of soil cement-lined sludge drying beds) never operated the demonstration bed as intended (i.e., to collect data to demonstrate to the Board that soil cement-lined sludge drying beds reflect best practicable control in this discharge situation). Consequently, neither the City nor its engineering consulting firm monitored the demonstration bed's performance to determine leachate percolation rate or waste characterization.

> **Recommendation 4.** Revise Finding 67 to describe the City's demonstration sludge drying bed (vaguely referenced in Provision I.21) and to indicate that the City did not operate the demonstration bed as intended even though it had several years to collect data on leachate volume and waste characterization necessary to demonstrate the effectiveness of soil cement-lined sludge drying beds for precluding the release of waste constituents to soil and groundwater in a manner that may contribute to an existing condition of groundwater pollution at the WWTF.

Finding 68 describes the significant weathered condition of the soil cement-lined sludge drying beds, but does not indicate whether the subject beds are associated with both Plants (Domestic and Industrial). The finding also does not, but should, identify the constructed depth of the soil cement liner.

> **Recommendation 5.** Revise Finding 68 to clarify which sludge beds were significantly weathered (Domestic, Industrial, or both) and identify the constructed depth of the soil cement liner in all sludge drying beds.

Finding 66 states, "Key conditions of acceptance of soil cement lined sludge drying beds include: comprehensive design criteria, stringent construction quality assurance and quality control, periodic maintenance, and effective monitoring of containment integrity. Municipalities are expected to discontinue use of the soil cement lined beds, implement an alternative method of sludge drying, and implement groundwater remediation measures if they cannot demonstrate containment is sufficiently protective of groundwater." Provision I.21 requires the City to submit a Sludge Drying Bed Assessment Report. This provision does not, but should, require the City to submit a proposed work plan for this assessment for staff review and concurrence. Also, the suite of assessed waste constituents does not, but should, include Part 503 metals. Should the assessment required by Provision I.21 indicate that the City's soil cement-lined sludge drying beds are inadequately protective of groundwater, the Tentative WDRs should require the City to cease sludge discharges to land within three years, which would necessitate the City to implement mechanical dewatering.

> **Recommendation 6.** Revise Provision I.21 to require the City to submit a written report describing a proposed work plan for the sludge drying bed assessment at least 90 days prior to the assessment report deadline of 29 October 2013. This will ensure that staff can review and approve the work plan proposed by the City's engineering consultant to collect and analyze data from the demonstration sludge drying bed.
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> **Recommendation 7.** Include in the suite of waste constituents to be included in the sludge drying bed assessment Part 503 metals (i.e., arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium and zinc).
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> **Recommendation 8**. Revise Provision I.21 (or include a new provision) to require the City to submit a technical report within 120 days following the 29 October 2013 assessment report deadline describing a work plan and implementation schedule for ceasing sludge discharges to land within three years if the assessment report presents data indicating that leachate released to soils from the soil cement-lined sludge drying beds has the potential to contribute to an existing condition of pollution in groundwater affected by WWTF operations.

The Tentative WDRs establishes a limitation for chloride of 175 mg/L for commingled discharge and a limitation for chloride of 106 mg/L in groundwater. Finding 28 characterizes the commingled discharge for several waste constituents of concern, but not chloride. Since chloride is a conservative constituent and does not generally attenuate in the soil profile and since the City's discharge to existing effluent percolation ponds currently contributes 3.3 mgd to underlying groundwater (Finding 39), the Board should lower the chloride effluent limitation to a level that ensures the City complies with the chloride groundwater limitation.

> **Recommendation 9.** Revise Finding 28 to include chloride and revise Commingled Discharge Specification E.2 to lower the chloride effluent limitation from 175 mg/L to a value that ensures (after accounting for evaporative losses) chloride concentrations in percolating effluent will not cause groundwater chloride levels to exceed 106 mg/L.

Provision I.5 requires the City to "not allow pollutant-free wastewater to be discharged into the WWTF collection, treatment, and disposal systems in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means storm water (i.e., inflow), groundwater (i.e., infiltration), cooling waters, and condensates that are essentially free of pollutants." To ensure that the City's industrial users do not dilute their discharges with potable or otherwise pollutant-free water to reduce the salinity of their discharges to levels compliant with their permitted values, the Provision should also require the City to not allow industrial dischargers to dilute their discharges with pollutant-free water specifically to achieve compliance with their salinity limits.

> **Recommendation 10.** Revise Provision I.5 to add the following: *The Discharger shall also not allow significant industrial users to dilute their discharges with pollutant-free water (e.g., source water) to purposefully lower discharge salinity to levels compliant with City-issued salinity limits.*

Provision I.9 prescribes the following discharge specification for dissolved oxygen in wastewater ponds:

> As a means of discerning compliance with General Discharge Specification B.8 [concerning objectionable odors], the dissolved oxygen (DO) content in the upper one foot of any wastewater pond (other than those that require an anoxic or anaerobic environment for the design treatment) shall not be less than 1.0 mg/L for three consecutive weekly sampling events. If the DO in any single pond is below 1.0 mg/L for three consecutive sampling events, the discharger shall report the findings to the Central Valley Water Board in writing within 10 days and shall include a specific plan to resolve the low DO results within 30 days.

The Tentative MRP only requires the City to monitor pond DO on an "as required" basis (i.e., if the City receives an odor complaint). To assess compliance with Provision I.9, the Tentative MRP should require the City to monitor pond DO on at least a weekly basis (to assess compliance with Provision I.9) and should specify the City monitor pond DO in the morning (i.e., between the hours of 8:00 and 9:00 am) when DO levels are at their lowest as a result of diurnal algae respiration. Without specifying the time of day for pond DO monitoring, the City is allowed to monitor pond DO in the late afternoon when DO levels are at or above saturation levels (again as a result of diurnal algae respiration). I hope that staff's failure to specify the time of day for pond DO monitoring is a simple oversight and not a purposeful omission to ensure the City does not collect the appropriate data to evaluate compliance with Provision I.9.

> **Recommendation 11.** Revise the Tentative MRP to require weekly monitoring of pond DO and specify pond DO monitoring be conducted between 8:00 and 9:00 am.

The Tentative MRP requires Fermenter influent and effluent monitoring and reporting, but the Tentative WDRs do not provide justification for this reporting. Without such justification, the required reporting appears to be unnecessary micromanaging of the City's Industrial Plant operations. Finding 23 describes the Fermenter's rated BOD removal capacity and operational parameters (e.g., monthly average and peak hourly flows, maximum COD loading, and unspecified "optimum pH, alkalinity, and temperature ranges"). The proposed monitoring of Fermenter influent and effluent does not appear sufficient to allow for a full assessment of

Fermenter operation (e.g., there is no requirement to monitor COD loadings or peak hourly flow). Also, it is not clear whether domestic and/or industrial sludge discharges to the Fermenter occur before or after the Fermenter influent monitoring point.

> **Recommendation 12.** Revise the Information Sheet to provide justification for Fermenter influent and effluent reporting. If, upon re-evaluation, staff determines this reporting unnecessary, revise the MRP to omit this reporting. Alternatively, revise the monitoring and reporting of Fermenter influent and effluent to include parameters and constituents relevant to the design parameters identified in Finding 23 (e.g., monthly average flow, peak hourly flow, COD loading rate). And, clarify whether the Fermenter influent monitoring point is located before or after the point(s) at which domestic and/or industrial sludge discharges are introduced to the Fermenter.

The following additional comments on the Tentative MRP include my recommended changes:

> The Tentative MRP does not, but should, require Commingled Effluent monitoring for Part 503 metals (i.e., arsenic, cadmium, copper, lead, mercury, molybdenum, nickel, selenium and zinc). Such monitoring should be performed at least annually coincident with Priority Pollutant monitoring. And, the suite of General Minerals identified in the Glossary should also include iron, manganese, copper, and zinc for completeness. Additionally, Commingled Effluent should be monitored at least monthly for sodium adsorption ratio (SAR) to assess its acceptability for agricultural use.
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> The Tentative MRP should require quarterly monitoring of groundwater potentially influenced by sludge bed discharges for Part 503 metals at least until sufficient data is submitted to warrant decreasing monitoring frequency. Also, groundwater in all monitoring wells should be monitored for Total Coliform Organisms at least annually to assess compliance with the groundwater limitation for TCO and to assess monitoring well construction integrity. The list of monitored groundwater parameters and constituents to be reported in tabular form in quarterly monitoring reports should also include groundwater depth and elevation for assessment purposes.
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> The Tentative MPR should be revised to clarify that loadings should be reported for each discrete Use Area or, if applicable, each individually managed recycled water irrigation area within each discrete Use Area. The Information Sheet (on page 3) specifies this ("calculate nitrogen and salt loading to individual Use Areas"), so the Tentative MRP should also specifically require this.
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> The Tentative MRP requires the City to report a summary of daily and cycle average BOD loading rates to Use Areas even though the Tentative WDRs do not prescribe a BOD loading limit. The effluent BOD limitations prescribed by the Tentative WDRs implement a decades-old Basin Plan requirement for municipal discharges exceeding 1 mgd capacity. However, they do not reflect the WWTF's actual treatment performance, which, because of the requirement for nitrogen removal, will generate an effluent with BOD concentrations much lower than the prescribed 40 mg/L monthly average limit. As such, BOD loadings to Use Areas should not be a water quality or

nuisance concern. Therefore, the requirement for the City to determine and report daily and cycle average BOD loadings is an unnecessary burden that has no regulatory purpose.

Miscellaneous Comments

Because so many of the City's groundwater monitoring wells have gone dry, the Tentative WDRs should require the City to replace monitoring wells that are dry for more than three consecutive monitoring events, or provide technical justification why replacement of dry wells is not necessary or may be postponed.

The Information Sheet (on page 2) misspells a technical term for a type of wastewater treatment: "dissolved air floatation" should be corrected to "dissolved air flotation" (check elsewhere in the Tentative WDRs to correct the spelling of this treatment technology).

The Information Sheet (on page 4) contains a sentence that needs editing: "The Tulare Irrigation District maintains multiple groundwater recharge basins and unlined canals because in an attempt to designed to store water for drought years." Also, the Information Sheet should mention whether Users also receive surface water deliveries from cited irrigation districts.

The Information Sheet (on page 4) describes the City's 2009 Report of Waste Discharge and other information regarding background groundwater nitrate concentrations. Since nitrate is expressed as nitrogen elsewhere in the Tentative WDRs, all references to nitrate should be revised (as necessary) to express nitrate as nitrogen.

The Information Sheet (on page 7) references a technical report included in the City's 2009 RWD, *Evaluation of interim groundwater quality limits (EC, TDS, B, Cl and Na) posed on POTWs for protection of irrigated agriculture in the Central/Southern San Joaquin Valley* by Dr. Stephen Grattan of UC Davis. Because of the report's potential regulatory significance, staff should post this report on the Board's website for public review.

The Information Sheet (on page 10) contains a sentence that requires editing: "This Order sets effluent limits for BOD_5 and TSS of 40 mg/L as monthly average and 80 mg/L as daily maximum percent removal."

Attachments A and F should be revised to identify functional and non-functional (dry) groundwater monitoring wells.

The legends in the figures presented as Attachments C, D, and G should be revised to change "Master Reclamation Permit" to "Master Recycling Permit" for consistency with the terminology used in the Tentative WDRs.

The Tentative MRP lists groundwater monitoring for depth twice.

Comments on Tentative Special Order Rescinding CDO R5-2002-0186

Finding 10 of the Tentative Special Order states, "The ongoing discharges from the WWTF are not expected to cause groundwater degradation that exceeds applicable water quality objectives or adversely affects beneficial uses." Since the Discharger has not characterized groundwater potentially influenced by sludge discharges to soil cement-lined drying beds, this statement only applies to groundwater influenced by discharges of commingled effluents from the Domestic Plant and Industrial Plant. This sentence should be revised to read: "The ongoing discharges from the WWTF *of commingled Domestic and Industrial Plant effluents to percolation ponds and Use Areas* are not expected to cause groundwater degradation that exceeds applicable water quality objectives or adversely affects beneficial uses." The Tentative Special Order should also include a finding that describes the efforts taken (or not taken) by the Discharger to demonstrate that soil cement-lined sludge drying beds are effective in ensuring sludge discharges do not cause or contribute to exceedances of applicable water quality objectives.

I appreciate the opportunity to offer these comments and recommendations.

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