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Comments— Tentative WDRs for Sandridge Partners, L.P., Sandridge Cattle Processing Facility, Kings County

This letter transmits my comments on the subject tentative order issued 14 June 2024. I am a California registered civil engineer and worked for Central Valley Regional Water Quality Control Board, mostly in the WDR Program, from 1998 to 2010.

The tentative order proposes to authorize a new discharge to land of up to 14 million gallons annually of beef processing wastewater by Sandridge Partners, L.P. (Discharger) on property near the City of Lemoore. Once constructed and fully operational, the Discharger's cattle processing facility (Facility) will operate five days a week and process up to 210 cattle per day (Finding 2). Wastewater from the beef cutting and processing area will comprise most of the Facility's wastewater stream and, of that, "over 95%...is primarily wash water from disinfecting the processing equipment and cutting floor" (Finding 15).

Comment 1: Please identify the Facility's disinfection chemicals and discuss the extent to which their use may cause the discharge to contain disinfection by-products (e.g., trihalomethanes) in concentrations that may pose a threat to groundwater quality.

Finding 16 cites the Facility's estimated wastewater discharge volumes at 52,500 gallons per day (gpd) from the Cutting-Processing/Slaughter Floor and 1,125 gpd from the Holding Pens, or a combined 53,625 gpd or 13.94 million gallons (MG) annually.

The tentative order's Proposed Process Water Flow Diagram (Attachment C) shows waste generation areas discharging either to the Sand Lane or Treatment System, and the effluent from both discharging either to Pond No. 1 or Pond No. 2, and Pond No. 2 discharging either to Land Application Area (LAA) No. 1 or LAA No. 2 (also referenced elsewhere as LAA-01 or LAA-1 and LAA-02 or LAA-02). Presumably, the diagram's solid lines indicate typical flow paths and dashed lines, possible alternatives (e.g., Treatment System effluent to Pond No. 2, and Pond No. 2 effluent to LAA-02). If this assumption is correct, then the flow diagram indicates the ponds will be typically operated in series, and Pond No. 2 will typically discharge to LAA-01.

Comment: Consider using similar abbreviations for the LAAs throughout the tentative order and its monitoring and reporting program. Also, revise Attachment C to provide a legend for its solid and dashed lines, or explain the meaning of these lines in the finding that first references the attachment.

The Treatment System features screening, coagulation, and dissolved air flotation (Finding 17). Its effluent will be impounded in one of two 1.5-acre, above-grade “double-lined effluent storage ponds constructed for effluent/water storage, [biochemical oxygen demand] aeration control, and retention for irrigation” (Finding 11). The ponds will be equipped with surface aerators (Finding 14). Their combined storage capacity of 3.8 million gallons (MG) (Finding 20) provides almost 70 days of detention at a maximum wastewater discharge flow of about 0.055 million gallons per day (MGD). This long detention time and pond depth, cited as 7.7 feet (Finding 20), mean the ‘effluent storage ponds’ effectively function as facultative lagoons.

The tentative order’s Monitoring and Reporting Program (MRP) identifies Monitoring Location INF-01 as the location “where a representative sample of the combined discharges from the holding pens and slaughterhouse can be collected following treatment but prior to discharge into either Effluent Storage Pond No. 1 (PND-01) or Pond No. 2 (PND-02). Finding 14 states the Sand Lane effluent “will gravity flow via pipeline to ... Pond No. 1.” Because it appears that the effluent discharges from the Sand Lane and Treatment System are not co-mingled (e.g., in a sump) prior to pond discharge, this monitoring location, as defined, may pose an operational challenge for the Discharger.

Comment: Since Sand Lane effluent comprises only two percent of the Facility’s wastewater flow, consider revising the MRP to establish separate monitoring locations for the two effluents and monitor these separately for the same constituents, but at a much reduced frequency for the Sand Lane discharge due to its relatively low volume.

Presumably, the Discharger’s Report of Waste Discharge (RWD) characterized the Facility’s Treatment System for design percent removal of 5-day biochemical oxygen demand (BOD₅) at maximum wastewater flow. To monitor whether the Treatment System is being properly operated and maintained in accordance with that proposed in the RWD, the MRP should require Treatment System influent be periodically monitored for BOD₅ and other constituents, as appropriate. The resulting data are necessary to evaluate whether the Treatment System is being operated as designed.

Comment: What is the design BOD₅ removal of the Facility’s Treatment System at maximum design flow? Consider revising Finding 15 to include this information. And, please consider adding a new monitoring location for Treatment System influent, that is, a location where a representative sample of the combined discharges from the slaughterhouse can be collected prior to treatment, and require quarterly monitoring of Treatment System influent for BOD₅, at a minimum.

The MRP defines EFF-01 as the location “where a representative sample of the comingled wastewater can be obtained after all treatment and storage (i.e., PND-001 and PND-02) prior to discharge to the LAAs or blending with irrigation water (or any other water).”

The tentative order’s Discharge Prohibition B.3 prohibits the discharge of “waste other than the Facility’s treated process wastewater at the locations and in the manner described in the Findings and authorized herein...” Its Flow Limitation C.1 establishes maximums for monthly daily average and annual discharge flows to the effluent storage ponds, monitored at INF-01.

Comment. Because Attachment C’s flow diagram indicates the LAAs receive discharge only from Pond No. 2, consider revising the monitoring location description as follows:

Location where a representative sample of the comingled wastewater can be obtained after all treatment ~~and storage~~ (i.e., ~~after storage in PND-001 and~~ PND-02) prior to discharge to the LAAs or blending with irrigation water (or any other water).

The Facility and LAAs are located outside of the City of Lemoore’s limits. Finding 32 refers to “the community of Lemoore,” even though it is an incorporated city. The City’s 2024 General Plan Map¹ shows the LAAs within the city’s Urban Growth Boundary, with LAA-1 zoned as Employment Reserve Area and LAA-2 zoned for Low and Very Low Density Residential, Neighborhood Commercial, Community Facilities, Professional Office, and Regional Commercial.

Comment: Revise Finding 32 to refer to the “City of Lemoore,” as it is an incorporated city. And, please comment on how the City of Lemoore’s General Plan proposals for zoning changes in LAA-02 may impact its long-term use for Facility wastewater disposal?

Finding 12 indicates that effluent from Pond No. 2 will be used to supplement irrigation of crops grown on the LAAs. It does not disclose the type of irrigation used (e.g., flood, sprinkler) or characterize the hydraulic loading to LAA soils during crop irrigation events. This information is necessary to evaluate the validity of assumptions used to estimate loadings of salt, nitrogen, and organics.

Comment: Consider revising Finding 12 to indicate what kind of irrigation method will be employed for effluent disposal (e.g., flood irrigation).

LAA-01, the primary LAA, encompasses 369 acres that can be used for effluent disposal (Findings 4, 12, 24). Finding 67.a cites the usable acreage as 366 acres.

Comment: Revise Finding 67.a to cite LAA-01 area as 369 acres.

¹ <https://lemoore.com/wp-content/uploads/2024/04/2024-Lemoore-General-Plan-2-8-24.pdf>

If effluent is distributed uniformly across the entire 369 acres available in LAA-01, the hydraulic loading from an annual discharge flow of 14 MG is 1.4 inches/year/acre. An assumed uniform annual application of effluent across 369 acres appears to be behind the tentative order's characterization of the discharge's almost negligible annualized BOD loading of less than 1 lb/acre/day,² also cited in Finding 67.c. Unlike annual loadings of salt (or fixed dissolved solids, FDS) and of nitrogen, values used to characterize a discharge's projected annualized daily BOD loading are not very informative with respect to groundwater quality impacts and odor and vector prevention. Because of this, BOD loadings are almost always expressed as instantaneous (on the day of application) and cycle-average (averaged over the course of an irrigation cycle of application followed by drying or rest interval). The BOD loading from a 6-inch application depth of effluent containing 450 mg/L BOD₅ exceeds 600 lbs/ac on the day of application.³ To meet the tentative order's 50 lbs/acre/day cycle average BOD loading limit (Land Application Area Specification F.6), each check or furrow receiving this loading will require almost two weeks drying interval prior to re-application.

Comment: If the tentative order's disclosed values for estimated salt, nitrogen, and organic loadings in Finding 67 assume that wastewater will be applied uniformly across the entire 369 acres of LAA-01, please explain how this will actually be achieved, especially if flood irrigation is used. If flood irrigation is used, consider disclosing the expected effluent application depth per irrigation event (e.g., six inches?), and disclose the area (in acres) that actually will be used annually for wastewater disposal and recalculate expected loadings presented for salt, nitrogen, and organics. And, reconsider the information value of presenting an annualized BOD loading, and instead provide estimates for instantaneous and cycle-average BOD loadings.

Finding 20 indicates that, due to high groundwater levels, the two lined effluent storage ponds will be constructed with their base above existing grade and equipped with a groundwater dewatering system that engages when groundwater is within 3 feet of ground surface.

Comment: How does the Discharger propose to dispose of groundwater extracted from the operation of the effluent ponds' groundwater dewatering system?

Finding 23, Table 3, Anticipated Pond No. 2 Effluent Quality, presents a value of 240 mg/L for nitrate as nitrogen. This value likely refers to the combined concentrations of organic nitrogen and ammonia measured by Total Kjeldahl Nitrogen (TKN), and is comparable to the TKN concentration in the discharge from a similar, albeit larger, beef processing facility in Kings County.⁴ Table 3 does not identify expected discharge concentrations for potassium and phosphorus, even though expected loadings of these two constituents are presented in Finding 25, Table 5.

² (14 MG/year)(year/365 days)(450 mg BOD/L)(8.34)/369 acres = 0.4 lb BOD/acre/day

³ (0.5 AF effluent application/acre)(0.3255 MG/AF)(450 mg/L BOD)(8.34) = 611 lbs/ac

⁴ See Finding 16, WDR Order R5-2023-0028 for Central Valley Meat Company, Inc. et al., Hanford Beef Processing Facility, Kings County

Comment: Please check the accuracy of the 240 mg/L value cited in Finding 23 for discharge nitrate as nitrogen and revise finding accordingly (and also Finding 67). Also, revise Table 3 to include expected discharge concentrations of potassium and phosphorus.

Finding 56 presents boilerplate language regarding the Tulare Lake Basin Plan's new Nitrate Control Program, tailored to reflect the Discharger's intent "to participate in the Pathway B Management Plan for Groundwater Basin 5-022.12." The boilerplate language begins with, "For the Nitrate Control Program, dischargers of nitrate to groundwater basins or sub-basins that are unable to comply with stringent nitrate limits will be required to take on alternate compliance approaches that involve providing replacement drinking water to persons whose drinking water is affected by nitrates."

Comment: What, specifically, are the "stringent nitrate limits" referenced in Finding 56? Are they the tentative order's groundwater limitations to protect MUN beneficial uses (i.e., 10 mg/L nitrate as nitrogen)? The Discharger proposes to use double-lined surface impoundments equipped with leachate recovery and effluent disposal by crop irrigation at rates not exceeding agronomic demand. It would appear, then, the proposed discharge poses a low threat of exacerbating what may be an existing condition of nitrate pollution in shallow, perched groundwater. Accordingly, please explain exactly why the Discharger will be "unable to comply with stringent nitrate limits."

Finding 67 provides estimates of concentrations in the discharge of Fixed Dissolved Solids (1,950 mg/L) and total nitrogen (as high as 240 mg/L). The finding indicates that the estimated per-acre annual loadings to LAA-01 provided in the May 2023 RWD ranged from 223 to 445 lbs for salt (Finding 67.a) and from 217 to 327 lbs for total nitrogen (Finding 67.b). At the maximum annual discharge flow of 14 MG and uniform application on the entire 369-acre LAA-01, these concentrations yield per-acre annual loading of about 620 lbs for FDS and about 75 lbs for total nitrogen.

Comment: The RWD's estimated FDS and total nitrogen loadings to LAA-01 appear to not accurately reflect the discharge flow and FDS and total nitrogen concentrations presented in Table 10. Please confirm the accuracy of the estimated loadings and revise the finding as appropriate.

Finding 67.b states, in part, that: "...the Discharger has proposed (and required per these WDRs) to implement various measures to reduce the Facility's potential impact on underlying groundwater (i.e., lining the Facility's ponds and application of process wastewater on crops at agronomic rates." Finding 67.c states, in part, that: "the WDRs require the Discharger to install double lined effluent storage ponds...." Discharge Specification E.6 states, "The storage of beef processing wastewater shall be on an engineered lined surface with a leachate collection system as described in the Findings and the May 2023 Pond Liner Report." This narrative requirement lacks a numerical value for the maximum hydraulic conductivity deemed acceptable for the engineered liner. The May

2023 Pond Liner Report likely cites this value. The Statewide Winery General Order⁵ establishes a hydraulic conductivity standard of 1×10^{-6} centimeter per second (cm/s) or less for new or existing winery wastewater ponds using one of four design options. This hydraulic conductivity standard should also be applied to this discharge's pond liner systems to reflect the Discharger's laudable implementation of best practicable control.

Comment: What is the design hydraulic conductivity of the effluent ponds' liners? Does it meet or exceed the 1×10^{-6} cm/s standard in the Statewide Winery General Order? Consider revising Discharge Specification E.6 to include: "The engineered lined surface shall meet a hydraulic conductivity standard of 1×10^{-6} centimeter per second."

Discharge Specification F.17 requires the "Discharger shall take actions to inspect and repair the primary liner system if necessary" in the event that "leachate in either/both [Leachate Collection and Removal System] exceeds the [Action Leakage Rate]." It does not, however, establish a time frame for the Discharger to complete this work.

Comment: Consider revising Discharge Specification F.17 to establish a reasonable time limit for the Discharger to complete its inspection and repair of the primary liner system.

Discharge Prohibition B.3 (Discharge of wastes other than the Facility's treated process wastewater at the locations and in the manner described in the Findings and authorized herein is prohibited) and Discharge Prohibition B.4 (Discharge of waste at a location or in a manner different from that described in the Findings is prohibited) appear duplicative.

Comment: Consider combining the intent of Discharge Prohibitions B.3 and B.5 in one prohibition.

Discharge Specification E.4 mentions only the holding pens and not also the manure pad and dead animal management area.

Comment: Consider revising Discharge Specification E.4 to include the manure pad and dead animal management area.

Thank you for your time and consideration.



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⁵ State Water Resources Control Board Order WQ 2021-0002-DWQ General Waste Discharge Requirements for Winery Process Water