

INFORMATION SHEET

ORDER R5-2016-XXXX
 CALIFORNIA DEPARTMENT OF CORRECTIONS AND
 CALIFORNIA PRISON INDUSTRY AUTHORITY
 CORCORAN STATE PRISON AND CALIFORNIA SUBSTANCE ABUSE TREATMENT FACILITY
 WASTEWATER TREATMENT FACILITY AND DAIRY
 KINGS COUNTY

The California Department of Corrections, Corcoran State Prison and the California Substance Abuse Treatment Facility, own and operate a wastewater treatment facility (WWTF) that produces secondary non-disinfected effluent. The WWTF was commissioned in 1988 to serve the Prison only, but the WWTF was expanded in 1997 with the construction of the Substance Abuse Treatment Facility, and again in 2004 to expand the land application area and pave the sludge drying beds. Additionally, a dairy is present at the northeast corner of the Prison facility that is owned and operated by the Prison Industry Authority or PIA and that discharges its waste to the same land application area as does the WWTF.

WWTF effluent is discharged to about 331 acres of farm land (land application area) southeast of the WWTF. The land application areas are cropped rotationally with alfalfa, winter wheat, corn, etc., and crops are harvested. The WWTF also accepts secondary treated domestic sewage (up to 335 acre feet per year) from the City of Corcoran, mostly during non-irrigation periods. Dairy wastewater is discharged to the same 331-acre land application area from the Corcoran Prison dairy. The Dairy is at the northeast corner of the Prison facility and provides milk and other dairy products to CDC prisons throughout California. The Dairy and domestic wastes are stored in separate ponds, but are discharged to the same land application area. Both the discharge from the WWTF and the Dairy are regulated by Waste Discharge Requirements Order 95-267.

Effluent Characteristics

Effluent data from the WWTF since 2013 is presented below (27 samples). The exception is the total nitrogen result. The result for total nitrogen is from one sample collected in August 2015.

Table 1 - WWTF Effluent Results

<u>Year</u>	<u>Electrical Conductivity umhos/cm¹</u>	<u>Biological Oxygen Demand mg/L²</u>	<u>Total Suspended Solids mg/L²</u>	<u>Settleable Solids mg/L²</u>	<u>pH s.u.³</u>	<u>Total Nitrogen mg/L²</u>
2013	604	3.9	6.6	0.1	7.7	---
2014	594	39	77	13.8	7.6	---
2015	689	142	285	1.4	7.2	22
Average	614	47	77	5.8	7.6	---
Effluent Limits	500 + source	40/80	40/80	0.2/0.5	6-5 to 9.5	---

^{1.} umhos/cm = micromhos per centimeter.

^{2.} mg/L = milligrams per liter.

^{3.} s.u. – standard pH units

The discharge of wastewater from the WWTF complies with the effluent limits for electrical conductivity (EC), pH, and dissolved oxygen (DO), but has been exceeding the effluent limits for biochemical oxygen demand (BOD), total suspended solids (TSS), and settleable solids (SS) since August 2014 due to the failure of a recirculation pump. The pump has been ordered and

received (September 2015), but has yet to be installed. Once the recirculation pump is replaced, effluent BOD, TSS, and SS results should return to previous values that averaged 3.9, 6.6, and 0.1 mg/L, respectively in 2013, well within the limits.

The Dairy monitors its discharge to the land application area and follows the typical reporting format used by the Dairy General Order. In 2014, the Dairy reported that 36.1 million gallons or 98,797 gallons per day (GPD) of dairy wastewater was discharged to six individual fields within the land application area. The six fields are identified as C1 through C6 as listed in Table 2.

Table 2 - Dairy Nitrogen Loading Results

<u>Land Application Area</u>	<u>Acres</u>	<u>Crop</u>	<u>Pounds of Nitrogen Applied</u>	<u>Pounds per acre per year (lbs/ac/yr¹)</u>
C1 ²	54	Wheat	5,642	104
C1 ²	54	Corn	9,722	181
C2	55	Alfalfa	5,746	104
C3	52	Alfalfa	4,705	90
C4 ²	55	Wheat	5,746	104
C4 ²	55	Corn	9,953	181
C5	58	Corn	11,308	194
C6	57	Corn	11,113	194

1. lbs/ac/yr = pounds per acre per year.

2. Land Application Area fields C1 and C4 were double cropped in 2014

The 2014 Annual Dairy Report indicated loading of wastewater and manure to the individual parcels ranged from 90 to 194 pounds per acre per year (lbs/ac/yr). The estimated nitrogen load from the WWTF (based on the 22 milligrams per liter (mg/L) result from the August 2015 effluent sample) is about 205 lbs/ac/yr. For fields C2 and C4 cropped with alfalfa, the nitrogen utilized by the crop (~480 lbs/ac/yr for alfalfa) is greater than the combined nitrogen load from the WWTF and the Dairy (295 to about 309 lbs/ac/yr). For parcels C1 and C4 double cropped with wheat and corn, the amount of nitrogen applied (about 490 lbs/ac/yr) exceeds the typical uptake for the crops of corn and wheat combined, which can utilize about 375 lbs/ac/yr. Additionally, the nitrogen load to fields C5 and C6 cropped only in corn (~400 lbs/ac/yr) also exceeds the potential nitrogen uptake of 250 lbs/ac/yr. The potential uptake with respect to nitrogen can be increased by using other crops such as Sudan grass, clover grass, and vetch that can utilize from 300 to 400 lbs/ac/yr. Double cropping with Sudan grass in combination with wheat would have the potential to utilize up to 500 lbs/ac/yr and in combination with corn could utilize up to 575 lbs/ac/yr. This Order contains Provision G. 15 that requires the Discharger to prepare a Nutrient Management Plan and Land Application Area Specification F.14 that requires nitrogen be applied to the land application areas at agronomic rates.

Solids and Sludge/Biosolids Disposal

Solids removed by the WWTF bar screens are disposed of at an offsite landfill. WDR Order 95-267 contains sludge disposal specifications that indicate the Discharger must report any change in the use or disposal practices of sludge to the Executive Officer in at least 90 days in advance of

the change and that the use and disposal of sewage sludge shall comply with State laws and regulations.

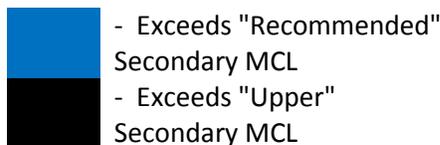
Groundwater Occurrence and Quality

Groundwater is present underlying the Prison in both unconfined and confined aquifers. The Prison complex is underlain by the Corcoran Clay at a depth of about 500 feet bgs and is reported to be about 80 to 100 feet thick in this area. The depth to first encountered groundwater in the vicinity of the Prison and the land application areas is about 20 feet below the ground surface (bgs) and based on groundwater elevations in first encountered groundwater monitoring wells present around the dairy, the direction of groundwater flow is generally to the west/southwest.

The water quality of the upper unconfined first encountered groundwater is highly variable, with water quality that meets water quality objectives in one well, and then is almost unusable only a few hundred feet away. Due to the shallow groundwater depth and the typical poor water quality, the land application area is tile drained to keep the shallow groundwater out of the root zone. The drainage water is pumped to a canal (conveyance facility owned and operated by the J.G. Boswell Company and the Tulare Lake Drainage District), which drains to an evaporation Basin operated by the Tulare Lake Drainage District.

A nine well groundwater monitoring well network (MW-1 through MW-9) is present around the dairy. MW-1 through MW-4 have been dry since 2008. Monitoring wells MW-5 through MW-9 were installed in late 2007, with MW-7 and MW-8 installed along the eastern property line as upgradient wells and MW-5, MW-6, and MW-9 installed as downgradient wells. The results since January 2008 are presented below in Table 3.

			4/17/14			67.0	8.00	1,10					
								0	37.0	37.0	42.0	76	780
7/17/14	75.0	7.80	1,100	39.0	41.0	37.0	75	780					
11/6/14	79.3	7.60	1,000	29.0	29.0	25.0	76	730					
2/17/15	77.7	7.80	950	25.0	25.0	25.0	63	630					
5/4/15	80.0	7.90	980	24.0	24.0	21.0	65	660					
8/14/15	84.0	7.80	910	23.0	23.0	20.0	61	630					
11/6/15	86.3	7.70	930	24.0	24.0	21.0	60	730					
Averages	71.1	7.7	1008.3	31.5	32.0	35.8	75.4	680.					
since 2013	79.9	7.9	990.0	32.0	31.3	70.8	686.7						



The results display the variability of the quality of the encountered groundwater and at first glance, it appears the dairy ponds are affecting the EC and TDS results in groundwater. EC and TDS are in excess of the MCLs in samples from downgradient MW-5 and MW-9 as might be expected, but EC and TDS results also exceed the MCL for both constituents in upgradient MW-8. The lowest EC, TDS, and total nitrogen results are observed in upgradient MW-7, with no exceedances of any MCL. However, downgradient MW-6 which is directly adjacent to and downgradient of one of the dairy retention ponds has the next lowest EC and TDS values that are well below the MCLs for EC and TDS. Both MW-6 and MW-7 were installed along the northern side of the dairy ponds. MW-6 and MW-7 are adjacent the City of Corcoran WWTF ponds, but the average EC of the City of Corcoran effluent is about 800 umhos/cm, much higher than the EC results reported for MW-6 and MW-7. The results from the monitoring wells around the Dairy demonstrate the variability in the groundwater quality of first encountered observed in the region. This variability is further demonstrated by reviewing groundwater data of a nearby tomato processing facility as discussed below.

The J.G Boswell Company operates its Corcoran Tomato Processing Plant a ¼ mile west of the WWTF and the 540 acres used for disposal/recycling of the tomato processing wastewater is a ¼ mile west of the WWTF at the southwest corner of the intersection of 6th and Paris Avenues. This land application area is also tile drained. The Boswell facility is regulated by WDRs Order R5-2008-0015. Shallow groundwater samples were collected from five shallow soil borings advanced within the Boswell land application area in 2007 to provide groundwater quality information during the preparation of WDR Order R5-2008-0015. J.G. Boswell also collected and analyzed a sample of the groundwater collected by a tile drain system. The results are shown in Table 4.

Table 4 - J.G. Boswell, 2007 Shallow Groundwater Results

<u>Sample No.</u>	<u>pH</u>	<u>Electrical Conductivity umhos/cm</u>	<u>Total Dissolved Solids mg/L</u>	<u>Total Nitrogen mg/L</u>	<u>Sulfate mg/L</u>	<u>Chloride mg/L</u>	<u>Sodium mg/L</u>
No. 1	7.5	1,041	883	10	330	16.9	38
No. 2	8.0	7,780	5,195	23.7	1,909	769	1,341
No. 3	7.5	2,732	2,123	3.1	967	88.2	252
No. 4	7.9	1,840	1,990	6.9	418	242	252
No. 5	7.7	3,754	3,043	18.6	1,599	202	252
<u>Tile Drain</u>	7.9	3,628	2,078	0.5	1,038	319	352

In addition to the data from the J.G. Boswell wells, the United States Geological Survey (USGS) monitors or has monitored numerous shallow wells in the region, 13 of which are in a five mile radius of the Prison. The results from the USGS wells dating back to 1958 indicate that EC and TDS in shallow groundwater are elevated and similar to but even slightly higher than these observed in wells of similar depth at the Prison Dairy.

The EC and TDS results from the J.G. Boswell site and nearby USGS wells are similar to but even higher than Prison’s groundwater monitoring results, while total nitrogen results are the same. The offsite data further illustrates the variable quality of the first encountered shallow groundwater of the region and that the results from the Prisons monitoring wells are typical of the first encountered groundwater of the region.

Source Water

Source water is supplied by the City of Corcoran groundwater supply wells and the data from 2013 through 2015 (four samples) are shown in the following table. Drinking water limits of maximum contaminant levels (MCL) for nitrate (as nitrate) is a Primary MCL and the value shown is the limit. The MCLs shown for the remaining constituents are Secondary MCLs developed as limits for the taste and odor (aesthetics) of drinking water. The two values listed display the “Consumer Acceptance Contaminant Level Ranges.” The first value listed is the “Recommended” Secondary MCL and the second value listed is the “Upper” Secondary MCL.

Table 5 - Supply Water Results

Date Sampled	Electrical Conductivity <u>umhos/cm¹</u>	Total Dissolved Solids <u>mg/L²</u>	Nitrate <u>mg/L²</u>	Chloride <u>mg/L²</u>	Sulfate <u>mg/L²</u>	Sodium <u>mg/L²</u>
Feb-13	354	192	21.2	27.5	34.1	62.6
Oct-13	389	230	11.2	31	20	60
Jun-14	362	200	7.3	30	27	67
Sep-15	420	250	2.7	30	27	67
MCLs	900/1600	500/900	45	250/500	250/500	

1. umhos/cm = micromhos per centimeter.

2. mg/L = milligram per liter.

Compliance History

A review of the record indicates the Prison is typically compliant with the requirements of WDRs 95-267. The Prison has typically submitted its self-monitoring reports and/or groundwater monitoring reports complete and on time. The Prison is typically compliant with effluent limits, but BOD, TSS, and SS results have been over the limit since mid-2014. The exceedances are the result of a Return Activated Sludge Pump that went out. The Prison had difficulty in getting the correct pump ordered, but the pump has now been purchased and received (September 2015), and the Prison WWTF staff has indicated it will be back on line shortly. The effluent results for

BOD, TSS, and SS are anticipated to return to their previous levels, which were well below the respective limits.

The record indicates the WWTF has been inspected six times since August 1997 and four Notices of Violation (NOVs) were issued in 2000, 2004, 2005, and 2009. The violations that led to the NOVs typically included:

- Violation of Discharge Specification B.3, exceeding the flow limit of 1.9 mgd.; and
- Violation of Discharge Specification B.11, for failing to report the freeboard of the effluent storage ponds..

Except as noted above, the discharge has generally complied with the effluent limits in WDR Order 95-267. A new flow meter was installed in 2004 and the discharge from the WWTF has been within the 1.9 mgd flow limit since 2005. Additionally, recent inmate populations at all State Prisons have been reduced, and the end result is the amount of effluent has decreased to about 1.47 mgd, well within the 1.9 mgd limit. A third retention pond was constructed in 2004, and there have been no issues with free board since the third effluent storage pond became operational.

Basin Plan, Beneficial Uses, and Regulatory Considerations

The Water Quality Control Plan for the Tulare Lake Basin, Second Edition, revised January 2015 (Basin Plan) designates beneficial uses, establishes water quality objectives, contains implementation plans and policies for protecting waters of the Basin, and incorporates, by reference, plans and policies adopted by the State Water Board. The beneficial uses of the underlying groundwater are municipal and domestic supply, agricultural supply, industrial service supply and industrial process supply.

While the Tulare Lake Basin Plan designates the beneficial uses of groundwater in the region as municipal and domestic, the WWTF and Dairy are adjacent and within known areas of shallow perched groundwater with high EC and TDS values. A 2001 Department of Water Resources (DWR) map for the Lemoore/Corcoran area shows EC values for the shallow groundwater of the area. The current land application area is in an area shown with EC values up to 2,000 umhos/cm. To the west about 1.5 miles west of the Dairy the 2001 DWR map depicts shallow groundwater with EC values ranging from 4,000 to 10,000 umhos/cm. The data presented on the DWR maps correlates with the data presented in Tables 6 through 8 in the Groundwater section. This indicates that background groundwater quality is poor and that the groundwater quality observed in the Dairy monitoring wells is similar to if not better than the results observed in nearby regional groundwater monitoring wells.

Antidegradation

State Water Board Resolution 68-16, the *Statement of Policy with Respect to Maintaining High Quality of Water in California* (Antidegradation Policy), requires the regional water boards to maintain high quality water of the State until it is demonstrated that any change in quality will not

result in water quality less than that described in State and Regional Water Board policies or exceed water quality objectives, will not unreasonably affect beneficial uses and is consistent with the maximum benefit to the people of the State.

Constituents of concern in the discharge that have the potential to degrade groundwater include salts and nutrients. Ambient water quality in the vicinity of the Prison is of poor quality dating back to 1958, prior to the construction of the Prison and/or the WWTF. The wastewater quality is lower in concentration to that of the nearby first encountered groundwater quality. The discharge of wastewater to the land application areas is not anticipated to degrade the underlying first encountered groundwater due to its existing poor quality

Degradation of groundwater by some of the typical waste constituents released with discharge from a domestic wastewater utility serving a State institution after effective source control, treatment, and control is consistent with maximum benefit to the people of the State. The technology, energy, and waste management advantages of domestic utility service far exceed any benefits derived from a Prison population otherwise reliant on numerous concentrated individual wastewater systems, and the impacts on water quality will be substantially less.

This Order establishes terms and conditions to ensure that the authorized discharge will not further degrade groundwater, or unreasonably affect present and anticipated future beneficial uses of groundwater. This Order is consistent with the Anti-Degradation Policy since: (a) the Discharger has implemented Best Practicable Treatment or Control to minimize degradation, (b) the degradation will not unreasonably affect present and anticipated beneficial uses of groundwater, or result in water quality less than water quality objectives, and (c) the limited degradation is of maximum benefit to the people of the State.

Title 27

Title 27, CCR, Section 20005 et seq. (Title 27) contains regulations to address certain discharges to land. Title 27 establishes a waste classification system, specifies siting and construction standards for full containment of classified waste, requires extensive monitoring of groundwater and the unsaturated zone for any indication of failure of containment, and specifies closure and post-closure maintenance requirements. Generally, no degradation of groundwater quality by any waste constituent in a classified waste is acceptable under Title 27 regulations.

The discharge of effluent and the operation of treatment or storage facilities associated with a sewage treatment and storage facility can be allowed without requiring compliance with Title 27, provided any resulting degradation of groundwater is in accordance with the Basin Plan and the waste need not be managed as hazardous waste.

CEQA

For the existing WWTF, the Discharger certified a final environmental impact report (EIR) on

12 August 1994 in accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). The EIR described the proposed expansion of the WWTF and the relocation of the land application area due to the construction of the Substance Abuse Treatment Facility.

Proposed Order Terms and Conditions

Discharge Prohibitions, Effluent Limitations, Discharge Specifications, and Provisions

The proposed Order would prohibit discharge to surface waters and water drainage courses.

The proposed Order would keep the monthly average daily discharge flow limit from the WWTF at 1.9 mgd, and the combined flow from both the WWTF and the Dairy at 2.01 mgd.

The proposed Order would prescribe effluent limits for BOD and TSS of 40 mg/L (monthly average), and 80 mg/L (daily maximum).

The proposed Order would prescribe effluent limits for EC of the EC of the source water plus 500 umhos/cm.

The discharge requirements regarding dissolved oxygen and freeboard are consistent with Central Valley Water Board policy for the prevention of nuisance conditions, and are applied to all such facilities.

The proposed Order contains Provision G.15 that requires the Dischargers to develop a Nutrient Management Plan to evaluate the organic content of the discharges and contains Discharge Specification F.14 to ensure the discharge of both WWTF and Dairy wastewater to the land application areas is at agronomic rates for the particular crops grown.

The proposed Order also contains Provision G.16 that requires the Dischargers to develop a Salinity Management Plan to evaluate the organic content of the discharge to the land application areas is not degrading the underlying groundwater with salts.

The proposed Order contains Provision G.17 that requires the Discharges to prepare a Title 22 Report for the discharge of domestic wastewater to the land application areas. Alternatively, the Dischargers shall demonstrate that its current practice of recycling wastewater to the land application area complies with current Title 22 Requirements.

The proposed Order prescribes groundwater limitations that ensure the discharge does not affect present and anticipated beneficial uses of groundwater. The limitations require that the discharge not cause or contribute to exceedance of these objectives or natural background water quality, whichever is greatest.

Monitoring Requirements

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Section 13267 of the California Water Code authorizes the Central Valley Water Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the State. Water Code Section 13268 authorizes assessment of civil administrative liability where appropriate.

The proposed Order includes influent, effluent, groundwater, pond, source water, dairy loading, and solids and monitoring. The monitoring is necessary to evaluate the extent of the potential degradation from the discharge.

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Legal Effect of Rescission of Prior WDRs or Orders on Existing Violations

The Board's rescission of prior waste discharge requirements and/or monitoring and reporting orders does not extinguish any violations that may have occurred during the time those waste discharge requirements or orders were in effect. The Central Valley Water Board reserves the right to take enforcement actions to address violations of prior prohibitions, limitations, specifications, requirements, or provisions of rescinded waste discharge requirements or orders as allowed by law.

Reopener

The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. The proposed Order would set limitations based on the information provided thus far. If applicable laws and regulations change, or once new information is obtained that will change the overall discharge and its potential to impact groundwater, it may be appropriate to reopen the Order.