INFORMATION SHEET

ORDER NO. R5-2011-____
CALIFORNIA DEPARTMENT OF CORRECTIONS AND REHABILITATION
CALIFORNIA CORRECTIONAL INSTITUTION - TEHACHAPI
WASTEWATER TREATMENT FACILITY
KERN COUNTY

The California Department of Corrections and Rehabilitation, Tehachapi State Prison (Discharger) is upgrading its Wastewater Treatment Facility (WWTF) that serves about 6,000 inmates and about 2,000 employees. The WWTF is currently regulated by Waste Discharge Requirements (WDR) Order 88-035 that allows for the discharge of up to 1.1 million gallons per day of wastewater to an approximately 114-acre Use Area.

Background

The Prison opened in 1933 as a minimum security women's prison, but was later converted to a men's correctional institution. The earliest Waste Discharge Requirements (WDRs) for the Prison were WDRs Orders 63-158 and 72-280. Initially, the WWTF provided primary treatment of wastewater with discharge to oxidation percolation ponds. WDRs Order 74-282 replaced Order 72-280 and permitted an average daily flow of 0.25 million gallons per day (mgd). Following the issuance of WDR Order 74-282, the WWTF is reported to have provided secondary treatment of the wastewater and effluent was disposed of on nearby rangelands.

The WWTF prior to the upgrade consisted of a headworks with grinding and coarse and fine screening, a flow meter, four aeration basins, two oxidation ponds, and one 3.5-acre storage pond. Wastewater was discharged to an approximately 114 acre spray field just west of the WWTF using spray irrigation cannons. The upgrade activities reduced the available spray field acreage to about 85 acres. The historic spray filed area was fallow and contained native vegetation and grasses. Crops were not grown in the spray fields and the resulting vegetation was plowed into the soil or grazed by livestock.

The Discharger is in the process of upgrading the WWTF to a tertiary treatment WWTF and the project is generally complete with the Discharger completing the final construction of an irrigation pump station. Upon completion of the upgrade project, the flows will remain the same with a Daily Dry Weather Average Flow of up to 1.1 mgd and a Peak Hourly Flow of 2.2 mgd. Discharge of the tertiary effluent will be to an expanded 181-acre Use Area consisting of the existing 85-acre spray field (disposal) and approximately 96 acres of adjacent farmland (recycling). Additionally, the Discharger is in negotiation with the Tehachapi-Cummings County Water District to use the tertiary treated water for irrigation of a nearby golf course and/or sod farms designated "Reclamation Areas." The Tehachapi-Cummings County Water District will apply for a separate Master Reclamation Permit for distribution of the tertiary treated water to the Reclamation Areas.

Solids/Biosolids Disposal

WDR Order 88-035 did not contain a Solids/Biosolids Disposal section and solids were not removed from the former treatment ponds until June 2010. During the upgrade of the WWTF, the Discharger submitted a *Notice of Intent for Biosolids Discharge to Land* dated 22 January 2010. The Discharger proposed to remove sludge or solids that had accumulated in the former treatment ponds, dewater the solids with a centrifuge, and then dry the solids in a

3.6-acre clay-lined drying area (previously a treatment pond). The dried solids are to be used as a soil amendment in the expanded Use Area and the Discharger was assigned coverage under General Order 2004-0012-DWQ for this specific project. The Discharger submitted a Pre-Application report on 3 June 2010 indicating a total of 2,127 tons of Class B biosolids would be applied to 60 acres at a rate of 35.4 tons per acre.

For the upgraded WWTF, solids removed by the bar screens and materials collected from the grit chamber are disposed of at a sanitary landfill.

Waste activated sludge will be pumped from the secondary clarifiers and dewatered using a centrifuge. The dewatered sludge will be transferred to the onsite 3.6-acre clay-lined drying bed. AECOM, the Discharger's consulting engineer, provided a 27 August 2010 signed and stamped memo that states the clay liner will confine any leachate to the storage pond area. Additional information regarding the application of biosolids to the Use Area, the storage area (thickness of clay liner, performance demonstration data, storm water controls), and the proposed methods of treatment of the sludge are required. The WDRs require the Discharger to prepare and submit a Use Area Management Plan, as indicated in Provision G.20 before land application of biosolids can proceed and to demonstrate the liner system of the storage pond will prevent the degradation of the underlying groundwater, as indicated in Provision G.11.

Additionally, the Discharger intends to apply for coverage under the General Biosolids Order (State Water Board Water Quality Order No. 2004-12-DWQ, "General Waste Discharge Requirements for the Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvicultural, Horticultural, and Land Reclamation Activities") as described in Finding 20 of the WDRs. For a biosolids use project to be authorized by the General Biosolids Order, the Discharger must file a complete Notice of Intent and receive a Notice of Applicability for each project.

Groundwater Conditions

WDR 88-035 did not require groundwater monitoring, but a limited amount of groundwater data (depth to groundwater, analytical results) is available from the testing of nearby irrigation wells, supply wells, and groundwater monitoring wells (monitoring first encountered groundwater) at a nearby motor pool site about 0.75 mile southeast of the WWTF.

The depth to groundwater in the vicinity of the WWTF was reported in WDR Order 88-035 to be on the order of 140 to 174 feet below the ground surface (bgs) with a direction of flow to the west/northwest. However, data indicates there is an upper or perched groundwater zone at about 40 feet bgs. The static water level in Well No. 12 (supply well) was recorded to be 64 feet at the start of a pump test in 1999 and a video log of supply well No. 11 at the same time depicted groundwater flowing into the well at a depth of about 34 feet bgs.

A groundwater monitoring network is present at an underground storage tank site referred to as the "Motor Pool" site. Clean up activities at the Motor Pool site are ongoing. The depth of the monitoring wells at the Motor Pool site range from 30 to 150 feet deep. The typical depth

to groundwater in the shallow wells at the Motor Pool site historically have ranged from about 15 to 65 feet bgs, with the average being about 35 to 40 feet bgs. Field electrical conductivity (EC) values in the motor pool upgradient wells (east of the Motor Pool site) range from about 500 to 600 micromhos per centimeter (µmhos/cm).

The Discharger submitted a Work Plan for the installation of three groundwater monitoring wells on 29 July 2010. Central Valley Water Board staff reviewed the Work Plan and concurred with the proposed design and location of the three wells. Well installation activities commenced in August 2010 and the wells have been installed, but well construction details and the preliminary analytical results have not been received at this time.

Source Water

Water is provided to the Prison by two sources: groundwater and surface water. Groundwater is supplied by Well No. 12, installed to a depth of 495 feet bgs in 1965. Well No. 12 produces about 1.15 mgd. A surface water system treats water from the State Water Project and supplies 0.75 mgd. Various herbicides and volatile organic compounds (VOCs) have been detected in the source water in previous testing. Additionally, nitrate and perchlorate in groundwater are regional concerns and have not historically been part of the effluent and/or groundwater monitoring programs. Monitoring of VOCs, pesticides, herbicides, nitrate, and perchlorate is included in Monitoring and Reporting Program R5-2011-____ for both effluent and groundwater monitoring.

Compliance History

Discharge Specification B.4 of WDRs Order No. 88-035 requires the 30-day dry weather discharge to be no greater than 1.1 mgd. The flows reported from the WWTF had been questionable for some time dating back to 1999. A new flow meter was installed in May 2008. From June 2008 to April 2009 the flow averaged about 0.45 mgd. This appeared to be low and the Discharger cited calibration difficulties. Then from May 2009 until September 2009 the flow appeared to increase averaging 1.18 mgd and exceeding the limit of 1.1 mgd in three of the five months. Another new flow meter was installed in October 2009 and the flow readings have averaged about 0.8 mgd since that time, which is well within the 1.1 flow limit.

Discharge Specification B.5 of WDRs Order No. 88-035 requires the effluent to meet the following limits for biochemical oxygen demand (BOD):

Constituent	Units	Monthly Average	Daily Maximum
BOD	mg/L	40	80

Historically, the Discharger has had difficulty meeting the BOD limits, with 13 of the 24 samples from 2007 through 2009 exceeding the monthly average of 40 milligram per liter (mg/L). The overall average during 2007 and 2008 was 47 mg/L.

The EC of the effluent averaged about 750 µmhos/cm from 2007 through 2008, but has decreased since 2009. From 2009 through July 2010, the average EC value of the effluent was 673 µmhos/cm. The EC of the source water has averaged about 635 µmhos/cm, which results in a 12 month rolling average EC of source water plus 500 µmhos/cm of 1,135 µmhos/cm. The average EC of the effluent, 673 µmhos/cm, is well below both the monthly average limit of 1,000 µmhos/cm and the 12 month rolling average calculated by adding the EC of the source water and adding 500 µmhos/cm.

A review of the files indicated the WWTF has been inspected 10 times since March 1991 and seven Notices of Violation (NOVs) have been issued. The violations that led to the NOVs typically included:

- Violation of Discharge Specification B.5, BOD > 40 mg/L;
- Violation of Discharge Specification B.7, improper disposal of screenings;
- Violation of Discharge Specification B.9, standing water in the use areas;
- Violation of Discharge Specification B.10, dissolved oxygen (DO) concentrations in effluent storage ponds of less than 1.0 mg/L; and
- Violation of provision C.1, late and/or incomplete self monitoring reports.

The Discharger submitted a technical report in June 2005 that addressed the improper disposal of screenings at the WWTF and Central Valley Water Board staff concurred with the Discharger's finding that no further action was required. Violations of the effluent limits for BOD, as well as low pond DO and standing water in the Use Area, are historic problems. Violation of the BOD limits is anticipated to cease due to the upgraded tertiary WWTF and this has already been documented, as the average BOD concentration has been 2.0 mg/L since January 2010. Effluent storage pond DO has not been below the limit of 1.0 mg/L since April 2008. Standing water violations are anticipated to improve with the increased storage capacity of the WWTF and the increase in the available acreage in the Use Area.

Basin Plan, Beneficial Uses, and Regulatory Considerations

The Basin Plan indicates the greatest long-term problem facing the entire Tulare Lake Basin is increasing salinity in groundwater, a process accelerated by man's activities and particularly affected by intensive irrigated agriculture. The Basin Plan recognizes that degradation is unavoidable until there is a long-term solution to the salt imbalance. The Central Valley Water Board encourages proactive management of waste streams by dischargers to control addition of salt through use, and has established an incremental EC limitation of 500 µmhos/cm as a measure of the maximum permissible addition of salt constituents through use.

Discharges to areas that may recharge good quality groundwaters shall not exceed an EC of 1,000 µmhos/cm, a chloride content of 175 mg/L, or boron content of 1.0 mg/L.

Antidegradation

State Water resources Control Board Resolution No. 68-16 (hereafter Resolution 68-16) requires the Regional Water Board to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with the maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in State and Regional Water Board policies (e.g., quality that exceeds water quality objectives).

WDRs Order 88-035 does not specifically discuss Resolution 68-16, but states; “Neither the treatment nor the discharge shall cause a pollution or nuisance as defined by the California Water Code, Section 13050, ” and “the discharge shall not cause degradation of any water supply.”

For salinity, the Basin Plan contains effluent limits (EC of SW + 500 µmhos/cm, 1,000 umhos/cm max; chloride - 175 mg/L; and boron - 1.0 mg/L) that are considered best practicable treatment and control. Quality of the first encountered groundwater beneath the WWTF is unknown, but field EC values from wells located about a half mile upgradient range from about 400 to 600 µmhos/cm. With an effluent EC of about 675 µmhos/cm, some degradation may occur from percolation of wastewater, but the resulting groundwater concentrations will be lower than water quality objectives.

The WDRs contain Provision G.22 requiring a Salinity Source Reduction Report that addresses salinity issues. Adherence to the effluent limits and application of fresh water along with effluent at agronomic rates should minimize degradation for salinity from recycling operations. Due to the quality of the effluent, spray field disposal operations are not expected to cause significant degradation.

The WDRs contain Effluent Limitation B.1 requiring the BOD and TSS concentrations in effluent to be less than a monthly average of 10 mg/L and a daily maximum of 20 mg/L. The Discharger is currently compliant with these limits with an average BOD concentration of 2.0 mg/L in 2010.

Generally, the quality of effluent will improve with the upgrade of the WWTF; therefore, degradation of groundwater should actually be less than authorized under the current WDRs and the future discharge will have less impact on water quality than previously permitted discharge. Upgrade of the WWTF will reduce nitrate as nitrogen concentrations in the effluent to less than the Primary MCL of 10 mg/L for nitrate as nitrogen. The EC of the discharge will be similar to that of the existing groundwater and will not adversely affect beneficial uses. Therefore, any potential degradation of groundwater should actually be less than authorized under the current WDRs.

The proposed WDRs do not include specific effluent limits for all of the constituents since:

a. Most constituents of concern have MCLs, which are specified by the Basin Plan and included under Groundwater Limitations, F.1.a of Order R5-2011-_____;

b. Some limits are duplicative (e.g., EC and TDS);

c. Groundwater Limitation F.1.b will provide a mechanism to ensure that constituents without an MCL do not threaten to unreasonably degrade groundwater; and

d. To prevent too many false positive violations, the list of regulatory limits should be limited to the best indicators of a groundwater problem that would be caused by the discharge.

In summary, the Order establishes groundwater limits for the WWTF that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan. The Order contains requirements for groundwater monitoring to assure that the highest water quality consistent with the maximum benefit to the people of the State will be achieved.

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. With treatment to remove organics and recycling of effluent at agronomic rates, the discharge of tertiary treated wastewater to the effluent storage ponds and the Use Areas authorized by this Order is in accordance with the Basin Plan and the Antidegradation Policy and is, therefore, exempt from Title 27 pursuant to Title 27, Section 20090(a).

The Discharger has proposed to solar dry and store mechanically-dewatered sludge in a clay-lined pond and then to land apply the resulting biosolids. Lined ponds can be considered BPTC, and the Discharger's engineering consultant, AECOM, has indicated that the clay-lined pond will contain leachate. However, the Discharger has not provided data regarding the pond's liner construction, performance, or its long-term ability to protect underlying groundwater from degradation. Provision G.11 of the WDRs requires the Discharger to demonstrate that its treatment and storage facilities protect the underlying groundwater from degradation and are exempt from Title 27 requirements. If it cannot, the Discharger is required to submit a work plan to indicate how it will comply with Title 27 requirements.

CEQA

The Discharger adopted a Final Environmental Impact Report (EIR) in 1985 in accordance with the California Environmental Quality Act (Public Resources Code Section 21000, et seq.). Central Valley Water Board staff reviewed the EIR and concurred that the EIR had addressed issues with regards to potential impacts to water quality.

In 1999 in anticipation of the upgrade of the WWTF, the Discharger filed a Notice of Exemption for the upgraded WWTF. The discharge described in these WDRs is consistent with the Notice of Exemption because:

a. This Order does not authorize expansion of the Prison's wastewater treatment and land application areas outside of areas previously identified for use; and

b. This Order limits the discharge flow to an equivalent daily flow of no more than 1.1 mgd, which is no more than the highest yearly average flow since 2007, and which is the same as the flow limitation in the current WDRs (Order No. 88-035).

Therefore, the action to revise waste discharge requirements for this existing facility is exempt from the provisions of the California Environmental Quality Act (CEQA), in accordance with Title 14, California Code of Regulations (CCR), section 15301.

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 at 1.1 mgd.

The proposed Order would prescribe effluent limits for BOD and TSS of 10 mg/L (monthly average), and 20 mg/L (daily maximum). Concentrations higher than this can limit or hinder the ability of the tertiary WWTF to disinfect the wastewater to levels that comply with Title 22 effluent quality requirements for disinfected tertiary recycled water.

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 WDRs would prescribe groundwater limitations that implement water quality objectives for groundwater from the Basin Plan. 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
Section 13267 of the CWC 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. In recent years there has been an increased emphasis on obtaining all necessary information, assuring the information is timely as well as representative and accurate, and thereby improving accountability of any discharger for meeting the conditions of discharge. Section 13268 of the CWC authorizes assessment of civil administrative liability where appropriate.

The proposed Order includes influent, effluent, groundwater, pond, use area, and water supply monitoring. The monitoring is necessary to evaluate the extent of the potential degradation from the discharge.

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.