

INFORMATION SHEET

ORDER R5-2014-XXXX
CITY OF SANGER
DOMESTIC WASTEWATER TREATMENT FACILITY
FRESNO COUNTY

The City of Sanger owns and operates both Domestic and Industrial wastewater treatment facilities. The two waste streams are for the most part separate and are not comingled. Sludge from both facilities is combined and dewatered onsite (the facilities are adjacent to one another). Discharges from the Domestic wastewater treatment facility (WWTF) are currently regulated by Waste Discharge Requirements (WDRs) Order 98-141, which allows for the discharge of up to 3.0 million gallons per day (mgd) of secondary treated wastewater to percolation basins designated the Lincoln Ponds. Discharges from the Industrial WWTF are regulated by WDR Order 98-131. The WDRs that are the subject of this Information Sheet will replace WDRs Order 98-141 and will only regulate discharges from the Domestic WWTF.

Background

The original WWTF was constructed in 1947 and it was modified in 1963 to allow for separate treatment of the industrial wastewater. Both treated domestic and industrial wastewater discharges were comingled at that time. The earliest WDRs Order for both the Domestic and Industrial WWTFs was WDRs Order 71-233, which was issued due to an upgrade of the wastewater treatment facilities and allowed a flow from the Domestic WWTF of 1.8 mgd and a flow of 1.5 mgd for the Industrial WWTF. The upgrade included requirements related to the construction of a new headworks structure, primary clarifier, aeration basins, secondary clarifiers, a digester, and sludge drying beds. WDRs Order 91-037 replaced WDRs Order 71-233 and allowed the same discharge of 1.8 mgd from the Domestic WWTF and 1.5 mgd from the Industrial WWTF.

A Cease and Desist Order (CDO) 91-038 was issued in conjunction with WDR Order 91-037, because the previous discharges from both WWTFs had caused organic and hydraulic overloading of the vadose zone and had subsequently degraded the underlying groundwater around the WWTFs. The CDO required the City to upgrade the WWTFs so the effluent would not degrade the underlying groundwater. In response, the City upgraded both of the WWTFs and provided a separate disposal site for the domestic effluent (Lincoln Ponds). The Central Valley Water Board rescinded CDO Order 91-038 on 15 January 2009.

In 1998, the Domestic WWTF was expanded and the flow increased to 3.0 mgd, while the Industrial WWTF was related to 1.3 mgd. WDRs (WDR Order 98-141 and WDR Order 98-131) were issued for each individual waste stream. WDR Order 98-141 was issued in June 1998 for the discharge of wastewater from the upgraded Domestic WWTF. The Domestic WWTF provides secondary treatment and the treated effluent is discharged to a series of percolation ponds designated the Lincoln Ponds. The Lincoln Ponds are about 3 miles south of the Domestic WWTF on the southern side of Lincoln Avenue. There are a total of six percolation ponds that cover about nine acres each. The total storage capacity is 328 acre feet. Three of the ponds are used for effluent disposal, and three are used only for "emergency purposes."

Effluent Characteristics

The City discharges about 1.6 mgd of wastewater to the Lincoln Ponds. Monitoring and Reporting Program (MRP) Order 98-141 requires the effluent to be tested for total suspended solids (TSS), biochemical oxygen demand (BOD), pH, and electrical conductivity (EC). The City tests the effluent for nitrate as nitrogen and has provided results since January 2012. The average effluent results since January 2011 through August 2013 (nitrate as nitrogen averages are from January 2012 through August 2013) are summarized in the following table.

SANGER DOMESTIC WWTF – EFFLUENT QUALITY

TSS	BOD	pH	EC	Nitrate as Nitrogen
<u>mg/L</u>	<u>mg/L</u>	<u>s.u.</u>	<u>umhos/cm</u>	<u>mg/L</u>
12	5	7.3	610	29

Nitrate as nitrogen concentrations in effluent are nearly three times the State's Primary maximum contaminant level (MCL) of 10 mg/L and are the likely cause of the elevated nitrate as nitrogen concentrations observed in monitoring wells downgradient of the Lincoln Ponds, as discussed in greater detail below.

Solids and Sludge/Biosolids Disposal

Solids removed by the Domestic WWTF bar screens and materials collected from the grit chamber are disposed of at a sanitary landfill. WDR Order 98-144 contains sludge/biosolids disposal specifications. The Discharger uses a gravity thickener and centrifuge to dewater the sludge prior to storing the dewatered sludge in 14 lined, paved, sludge drying beds equipped with underdrains to collect decant and route it back to either the Domestic or the Industrial WWTF. Dewatered sludge is stored onsite in the lined sludge drying beds for a minimum of two years, and is then hauled offsite for disposal by McCarthy Family Farms, a licensed hauler.

Groundwater Conditions

Six groundwater monitoring wells are present around the Lincoln Ponds. The primary groundwater flow direction is to the southeast towards the Kings River, but groundwater also flows to the east and south due to influences from the mounding of wastewater and due to nearby pumping activities. The depth of the wells ranges from 36 to 48 feet below the ground surface (bgs). Historically, the depth to water has ranged from about 17 to 45 feet bgs. In 2013, the depth to water ranged from about 32 feet bgs to 45 feet bgs and wells MW-1, MW-4, and MW-5 were found to be dry in July 2013.

In December 2013, the City notified Central Valley Water Board staff that all six of its groundwater monitoring wells around the Lincoln Ponds (MW-1 through MW-6) had gone dry. This Order contains Provision F.21 that requires the City to submit a work plan describing the installation of replacement groundwater monitoring wells and includes a time schedule requiring the wells to be installed in no greater than one year from the adoption of this Order.

MW-1 and MW-2 were installed as background wells, but MW-1 is set along the northern edge of the Lincoln Ponds and is affected by the City's discharge to the ponds. MW-2 is set at the northeast corner of the Lincoln Ponds, but is about 50 feet from a nearby unlined irrigation canal (Harp Ditch), that dilutes groundwater concentrations in MW-2. The City also maintains and monitors a six well groundwater monitoring network around the Industrial WWTF to monitor for potential impacts from the operation of the Industrial WWTF discharges. MW-101 and MW-102 provide upgradient groundwater monitoring for the Industrial WWTF. Groundwater samples are collected annually from the wells and the averages of the results for MW-101 and MW-102 since 2000 through 2012 are presented on the following table.

UPGRADIENT GROUNDWATER RESULTS

Well Number	TDS mg/L	EC umhos/cm	Bicarbonate mg/L	Calcium mg/L	Sodium mg/L	Chloride mg/L	Nitrate as Nitrogen mg/L
MW-101	117	167	60	18	6.9	3.2	2.4
MW-102	152	234	98	24	7.5	4.6	2.2

Analytical results for the wells used to monitor water quality in the vicinity of the Lincoln Ponds, MW-1 through MW-6, are presented below.

SANGER DOMESTIC WWTF GROUNDWATER RESULTS

Well Number	TDS mg/L	EC umhos/cm	Bicarbonate mg/L	Calcium mg/L	Sodium mg/L	Chloride mg/L	Nitrate as Nitrogen mg/L
MW-1	392	576	113	37	53	49	16
MW-2	82	95	21	8	6	12	5
MW-3	185	273	38	13	28	31	12
MW-4	357	543	110	48	33	40	18
MW-5	430	672	116	34	73	62	18
MW-6	411	635	87	23	71	61	18

Groundwater results are compared to various water quality objectives to assess degradation/pollution. Water quality objectives are discussed in detail in the *Water Quality Control Plan for the Tulare Lake Basin, Second Edition*. Typical water quality objectives include Primary and Secondary MCLs, Agricultural, and Drinking Water limits. Comparing the results of MW-101 and MW-102 to those from MW-1, MW-4, MW-5, and MW-6 shown above indicates the discharge has degraded groundwater in the vicinity of the Lincoln Ponds. However, with the exception of nitrate as nitrogen, the concentrations are less than applicable water quality objectives. Groundwater EC is less than the most stringent Agricultural goal of 700 umhos/cm and TDS and chloride are less than their respective Secondary MCLS.

Nitrate as nitrogen concentrations are elevated compared to upgradient concentrations, and are nearly twice the State Primary MCL of 10 mg/L. The results indicate the City's discharges to the Lincoln Ponds have polluted the underlying groundwater with respect to nitrate as nitrogen. Monitoring of nitrate as nitrogen, nitrate, Total Kjeldahl Nitrogen (TKN), ammonia,

and total nitrogen is included in Monitoring and Reporting Program R5-2014-XXXX for both effluent and groundwater monitoring.

Source Water

Source water is from a series of groundwater wells and the data was presented in a 2010 Consumer Confidence Report for the City of Sanger. Source water quality for 2010 is summarized in the following table. The first number listed is the average concentration and the values within the parentheses underneath are the range of the reported results.

CITY OF SANGER – SOURCE WATER QUALITY

EC <u>umhos/cm</u>	TDS <u>mg/L</u>	Chloride <u>mg/L</u>	Sulfate <u>mg/L</u>	Nitrate as Nitrogen <u>mg/L</u>
275	176	7.9	22	2.7
<u>(130 – 590)</u>	(89 – 360)	(2.1 – 31)	(5.5 – 72)	(nd ¹ – 7.6)

1. nd = not detected at a concentration greater than the laboratory practical quantitation (reporting) limit.

Compliance History

Discharge Specification B.1 of WDRs Order 98-141 requires the 30-day dry weather discharge to be no greater than 3.0 mgd. The average discharge to the Lincoln Ponds has averaged about 1.6 mgd since January 2010, well below the 3.0 mgd limit.

Discharge Specification B.4 of WDRs Order 98-141 requires the effluent to meet the following limits for biochemical oxygen demand (BOD) and total suspended solids (TSS):

<u>Constituents</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
BOD/TSS	mg/L	40	80

The Discharger has been compliant with the BOD and TSS limits, with no exceedances of the limits since January 2011.

Discharge Specification B. 7 of WDRs Order 98-141 requires the effluent to be less than or equal to the EC of the source water plus 500 umhos/cm. The resulting EC limit has ranged from 680 umhos/cm to 965 umhos/cm. The effluent EC is typically compliant with the limit, exceeding it only twice in over 125 samples analyzed since January 2011. The EC exceedances were 690 umhos/cm during December 2011 and 740 umhos/cm during January 2012. Both values are less than the secondary MCL of 900 mg/L.

Nitrate as nitrogen is not a part of the current MRP Order 98-141, but the City does analyze the effluent for nitrate as nitrogen and provided results from January 2012 through August 2013. The results indicate the effluent nitrate as nitrogen concentrations average about 29 mg/L. Groundwater downgradient of the Lincoln Ponds has nitrate as nitrogen concentrations that average about 18 mg/L, nearly twice the primary MCL of 10 mg/L.

Provision E.6 of WDR Order 98-141 requires the City to implement an Industrial Pretreatment Program by February 1999. The City adopted City Ordinance No. 990 in February 1999 and submitted a draft Industrial Pretreatment Program to the Central Valley Water Board. However, the Industrial Pretreatment Program was never implemented. This Order contains Provision F.16, which requires the City to implement its Industrial Pretreatment Program within two years of the adoption of this Order.

The WWTF has been inspected six times since June 1995 and two Notices of Violation (NOVs) were issued in 2000 and 2008. The violations that led to the NOVs typically included:

- Violation of Discharge Specification B.7 exceeding the EC effluent limit;
- Violation of Provision E.1, late and/or incomplete self-monitoring reports (SMRs);
- Violation of Provision E.2 (Standard Provisions), failing to properly maintain the WWTF; and
- Violation of Provision E.2 (Standard Provisions), failing to properly sign and certify SMRs.

Except as noted above, the discharge has since January 2011, generally complied with the effluent limits in WDR Order 98-141 and submits its Self-Monitoring Reports (SMRs) complete and on time. The WWTF was inspected on 5 June 2013 and appeared to be well maintained with no apparent operational issues noted.

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 $\mu\text{mhos/cm}$ as a measure of the maximum permissible addition of salt constituents through use. Also, the Basin Plan limits discharges to areas that may recharge good quality groundwater's to no more than an EC of 1,000 $\mu\text{mhos/cm}$, a chloride content of 175 mg/L, or boron content of 1.0 mg/L. The City is currently compliant with these limits.

Antidegradation

State Water Resources Control Board Resolution 68-16 ("Policy with Respect to Maintaining High Quality Waters of the State") (hereafter Resolution 68-16) prohibits degradation of groundwater unless it has been shown that:

- a. The degradation will not unreasonably affect present and anticipated future beneficial uses.

- b. The degradation does not result in water quality less than that prescribed in State and regional policies, including violation of one or more water quality objectives, and
- c. The discharger employs best practicable treatment or control (BPTC) to minimize degradation.
- d. The degradation is consistent with the maximum benefit to the people of the State.

Degradation of groundwater by some of the typical waste constituents released with discharge from a municipal wastewater utility 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 municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous concentrated individual wastewater systems, and the impacts on water quality will be substantially less. Economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, and therefore sufficient reason to accommodate growth and groundwater degradation provided terms of the Basin Plan are met.

WDR Order 98-141 authorized some groundwater degradation with respect to EC. Groundwater monitoring results indicate average EC concentrations in downgradient groundwater monitoring wells range from about 550 umhos/cm to 670 umhos/cm. Finding 10 of WDR Order 98-141 notes that, at the time, the EC and nitrate as nitrogen levels in groundwater in the vicinity of the disposal area (Lincoln Ponds) averaged 220 umhos/cm and 3.2 mg/L, respectively. The results indicate the City has degraded groundwater with respect to EC. However, the groundwater averages are less than applicable water quality objectives such as the Secondary MCL of 900 umhos/cm.

For salinity, the Basin Plan contains effluent limits (EC of SW + 500 μ mhos/cm, 1,000 umhos/cm max; chloride - 175 mg/L; and boron - 1.0 mg/L) that are considered best practicable treatment or control. Quality of the first encountered groundwater beneath the Lincoln Ponds is good, with EC values in background wells averaging about 170 umhos/cm to 230 umhos/cm. Chloride and boron concentrations in effluent are not known at this time, but they are included in MRP Order R5-2014-XXXX.

Recent groundwater monitoring data (Groundwater Results table on page 3) show nitrate as nitrogen results have averaged from 16 to 18 mg/L in wells downgradient of the Lincoln Ponds, about 5 times the 1996 average of 3.2 in groundwater and nearly twice the Primary MCL of 10 mg/L. The discharge has polluted the underlying groundwater with nitrate as nitrogen. The WDRs contain Provision F.19 requiring a Work Plan that sets forth the scope and schedule for a systematic and comprehensive technical evaluation of the Domestic WWTF's treatment and disposal system to control the concentrations of nitrate as nitrogen in the effluent. Furthermore, Provision F.20 of this Order includes a compliance schedule that requires the City to evaluate whether the changes made to address the discharges from the ponds will be sufficient to address the impacted groundwater or whether other measures are

needed to mitigate these impacts, and will ultimately ensure that groundwater will meet the nitrate as nitrogen limit of 10 mg/L.

The WDRs contain Effluent Limitation B.1 requiring the BOD and TSS concentrations in effluent to be less than a monthly average of 40 mg/L and a daily maximum of 80 mg/L. The Discharger is currently compliant with these limits with an average BOD concentration of 5.0 mg/L since 2011.

The Order establishes effluent limits and 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

California Code of Regulations, title 27, 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, that the discharge is regulated by WDRs, and that the waste need not be managed as hazardous waste. The discharge is currently polluting groundwater with nitrate as nitrogen, but Provision F.19 requires the Discharger to meet an effluent limit of 10 mg/L for nitrate as nitrogen or implement other measures to protect groundwater quality. The compliance schedule in Provisions F.19 and F.20 require the City to implement measures to assure compliance with water quality objectives. The application of these schedules is consistent with the Basin Plan. The compliance schedules ensure that the Title 27 wastewater exemption will be applicable to the discharge to the Lincoln Ponds.

CEQA

As part of the proposed expansion documented in the 2006 Report, the Discharger certified a Final Environmental Impact Report (EIR) (SCH #2006051135) on 27 February 2009 in accordance with the California Environmental Quality Act (CEQA) (Pub. Resources Code, § 21000 et seq.). The EIR describes the WWTF and proposed alternatives for modifications to increase the flow to 5.3 mgd, based on estimated population increases through 2035. Due to the declining economy in 2009, the proposed upgrades/changes to the WWTF have not yet been completed. The Central Valley Water Board commented on the EIR as a responsible agency.

The action of prescribing these WDRs, which impose regulatory requirements on the existing discharge in order to ensure the protection of groundwater resources, is exempt from the provisions of the CEQA in accordance with California Code of Regulations, title 14, section 15301, which exempts the “operation, repair, maintenance, [and] permitting ... of existing public or private structures, facilities, mechanical equipment, or topographical features” from environmental review. However, should the City choose to recycle treated wastewater from the Domestic WWTF to nearby farmlands, an additional CEQA evaluation may be required.

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 3.0 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 require the Discharger to implement an Industrial Pretreatment Program no later than two years from the adoption of the proposed Order.

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

Water Code section 13267 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, and source water, solids and sludge/biosolids, and industrial pretreatment 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.