

LATE REVISIONS
Placer County Facility Services District
Sewer Maintenance District No. 3 WWTP
Tentative NPDES Permit Renewal and Cease and Desist Order
Regional Water Quality Control Board, Central Valley Region
21/22 June 2007 Board Meeting
ITEM No. 29

In NPDES Permit:

1. Revise Ammonia limitations in Table in Section IV.A.1.a. as follows:

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
		lbs/day ¹	0.13			
Ammonia, total (as N) 1 May thru 31 October	mg/L	0.86	--	2.5	--	--
	lbs/day ¹	2.15	--	6.3	--	--
Ammonia, total (as N) 1 Nov thru 30 Apr	mg/L	<u>1.301.2</u>	--	<u>3.803.7</u>	--	--
	lbs/day ¹	<u>3.253.0</u>	--	<u>9.509.3</u>	--	--

2. Make the following correction to Section VI.C.2.a.:

2. Best Management Practices and Pollution Prevention

- a. **Pollution Prevention Plans for aluminum, 4,4-DDD, 4,4-DDT, aldrin, alpha-BHC, dichlorobromomethane, dibromochloromethane, copper, beta-endosulfan, turbidity, and endrin.** The Discharger shall prepare pollution prevention plans for aluminum, 4,4-DDD, 4,4-DDT, aldrin, alpha-BHC, dichlorobromomethane, dibromochloromethane, copper, beta-endosulfan, turbidity, and endrin in accordance with CWC section 13263.3(d)(3). The minimum requirements for the pollution prevention plans are outlined in the Fact Sheet, Attachment F. A work plan and time schedule for preparation of the pollution prevention plan shall be completed and submitted **within 6 months of the effective date of this Order** for approval by the Executive Officer. The Pollution Prevention Plan shall be completed and submitted to the Regional Water Board **within two (2) years following work plan approval by the Executive Officer**, and progress reports shall be submitted in accordance with the Monitoring and Reporting Program (Attachment E, Section X.D.1.).

3. Revise Fact Sheet Table F-1: Summary of Reasonable Potential Analysis as follows:

Table F-1: Summary of Reasonable Potential Analysis

CONSTITUENT	Sources	Objectives	Units	n	MEC	B
Ammonia Nitrogen, Total (as N)	USEPA National Ambient Water Quality Criteria	550 / 2,140 <u>3.83/2.23</u>	ug/L <u>mg/L</u>	468	2800 <u>2.8</u>	0.750 <u>0.750</u>
	Odor threshold (Amoore and Hautala)	1.5,500	umg/L			
	USEPA Draft Health Advisory	30,000	umg/L			
	USEPA National Ambient Water Quality Criteria	550 / 2,140	ug/L	-	-	-

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4. Revise Fact Sheet Section IV.C.3.b. Ammonia, as follows:

- b. **Ammonia**—Untreated domestic wastewater contains ammonia. Nitrification is a biological process that converts ammonia to nitrite and nitrite to nitrate. Denitrification is a process that converts nitrate to nitrite or nitric oxide and then to nitrous oxide or nitrogen gas, which is then released to the atmosphere. The Discharger does not currently use nitrification to remove ammonia from the waste stream. Inadequate or incomplete nitrification may result in the discharge of ammonia to the receiving stream. Ammonia is known to cause toxicity to aquatic organisms in surface waters. Discharges of ammonia would violate the Basin Plan narrative toxicity objective. Applying 40 CFR Section 122.44(d)(1)(vi)(B), it is appropriate to use USEPA's Ambient National Water Quality Criteria for the Protection of Freshwater Aquatic Life for ammonia, which was developed to be protective of aquatic organisms.

USEPA's *Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life*, for total ammonia, recommends acute (1-hour average; criteria maximum concentration or CMC) standards based on pH and chronic (30-day average, criteria continuous concentration or CCC) standards based on pH and temperature. It also recommends a maximum four-day average concentration of 2.5 times the ~~criteria continuous concentration~~ 30-day CCC. USEPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. Salmonids were more sensitive to acute toxicity effects than other species. However, while the acute toxicity of ammonia was not influenced by temperature, it was found that invertebrates and young fish experienced increasing chronic toxicity effects with increasing temperature. USEPA's recommended criteria are show below:

$$CCC_{30\text{-day}} = \left(\frac{0.0577}{1 + 10^{7.688 - pH}} + \frac{2.487}{1 + 10^{pH - 7.688}} \right) \times \text{MIN}(2.85, 1.45 \cdot 10^{0.028(25 - T)}),$$

CCC_{4-day} = 2.5 x CCC_{30-day}, and

$$CMC = \left(\frac{0.275}{1 + 10^{7.204 - pH}} + \frac{39.0}{1 + 10^{pH - 7.204}} \right),$$

where T is in degrees Celsius

Per the request of the Discharger, the maximum permitted effluent pH in this Order is further restricted from 8.5 to 8.2. (The Basin Plan objective for pH in the receiving stream is the range of 6.5 to 8.5.) To protect against worst-case short-term exposure to an aquatic organism, a pH value of 8.2 was used to derive the acute criterion. The resulting acute criterion is 3.83 mg/l. Additionally, the Discharger requested seasonal fixed ammonia limitations to account for the change in temperature. The maximum observed rolling 30-day average effluent temperature (as of July 2003) for the months from May through October was

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78.879.1 °F (26.2 °C), and 64.463.4 °F (18.17.4 °C) for the months from November through April. The maximum observed rolling 30-day R-1 temperature was 75.2 °F (24 °C), for the 30-day periods ending 31 July 2005. The maximum observed pH of the effluent for the months from May through October and November through April were 7.4 and 7.3 respectively.

Using a pH value of 8.27.4 and the reasonable worst-case temperature values of 26.2 °C (on a rolling 30-day basis) as shown above, the resulting seasonal effluent limitations the resulting 30-day CCC for the months from May through October is 2.23 mg/L (as N). Using a pH value of 7.3 and the worst-case temperature value of 63.4 °F (17.4 °C) on a rolling 30-day basis, the resulting 30-day CCC for the months from November through April is 4.22 mg/L (as N). The 4-day average concentration is derived in accordance with the USEPA criterion as 2.5 times the 30-day CCC. Based on a 30-day CCC of 2.23 mg/L (as N), the 4-day average concentrations that should not be exceeded are 5.58 mg/L (as N) and 10.55 mg/L (as N) for the summer and winter months, respectively. Using a pH value of 7.4 and the worst-case temperature value of 79.1 °F (26.2 °C) on a rolling 30-day basis, the resulting 30-day CCC for the months from May through October is 2.23 mg/L (as N).

The Regional Water Board calculates WQBELs in accordance with SIP procedures for non-CTR constituents, and ammonia is a non-CTR constituent. The SIP procedure assumes a 4-day averaging period for calculating the long term average discharge condition (LTA). However, USEPA recommends modifying the procedure for calculating permit limits for ammonia using a 30-day averaging period for the calculation of the LTA corresponding to the 30-day chronic criteria. Therefore, while the LTAs corresponding to the acute and 4-day chronic criteria were calculated according to SIP procedures, the LTA corresponding to the 30-day chronic criteria was calculated assuming a 30-day averaging period. The lowest LTA representing the acute, 4-day, and 30-day chronic criteria is then selected for deriving the average monthly effluent limitation (AMEL) and the maximum daily effluent limitation (MDEL). The remainder of the WQBEL calculation for ammonia was performed according to the SIP procedures.

Due to the difference in variation in the datasets resulting in slightly different coefficient of variation the following seasonally based ammonia limits will be applied:

-are:

From 1 May thru 31 October: Average Monthly Limitation: 0.861.3 mg/L (as N)
Maximum Daily Limitation: 2.53.9 mg/L (as N)
From 1 November thru 30 April: Average Monthly Limitation: 1.230 mg/L (as N)
Maximum Daily Limitation: 3.780 mg/L (as N)

In the above calculations, the acute toxicity condition prevails, which is based solely on pH. Because there is no information that supports the variation in pH is

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seasonal, the slight variation in the seasonal results is not considered and the ammonia effluent limitations for ammonia, as calculated above, are included in this Order are year-round limitations. The limitations will assure the treatment process facility adequately nitrifies the waste stream to protect the aquatic habitat beneficial uses of the receiving water. The following table illustrated the various factors and coefficients used to calculate the year-round effluent limitations:

Table F-8
WQBEL Calculations for Ammonia

	<u>May 1 to October 31</u>		<u>November 1 to April 30</u>	
	<u>Acute</u>	<u>Chronic (30-day)</u>	<u>Acute</u>	<u>Chronic (4-day)</u>
pH	8.2	8.2	8.2	8.2 <u>NA</u>
Temperature °C ⁽²⁾	N/A	26	N/A	18 <u>NA</u>
Criteria (mg/L) ⁽³⁾	3.83	0.855	3.83	1.435 <u>5.8</u>
Dilution Credit	No Dilution	No Dilution	No Dilution	No Dilution
ECA ⁽⁴⁾	3.83	0.855 <u>2.23</u>	3.83	3.585 <u>5.8</u>
Coefficient of Variation	1.62 <u>0.8</u>	1.62 <u>0.0</u>	1.7	1.72 <u>0</u>
ECA Multiplier ⁽⁵⁾	0.1317	0.4030 <u>4.7</u>	0.131	0.2036
LTA	0.502 <u>25</u>	0.3451 <u>0.05</u>	0.502	0.8451 <u>1.2</u>
AMEL Multiplier (99 th %)	⁽⁶⁾ 2.56	2.48 ⁽⁷⁾⁽⁶⁾	2.56	⁽⁶⁾
AMEL (mg/L)	⁽⁶⁾ 1.2	0.86 ⁽⁶⁾	1.3	⁽⁶⁾
MDEL Multiplier (99 th %)	⁽⁶⁾ 8.78	7.29 ⁽⁶⁾	7.63	⁽⁶⁾
MDEL (mg/L)	⁽⁶⁾ 3.7	2.5 ⁽⁶⁾	3.8	⁽⁶⁾

- (1) Acute design pH = 8.2 (max. allowed effluent pH)
- (2) Temperature = Maximum monthly average seasonal effluent temperature
- (3) USEPA Ambient Water Quality Criteria
- (4) 4-day criterion is 2.5 times the 30-day criterion per criteria document.
- (5) LTA developed based on Acute and Chronic ECA Multipliers calculated at 99th percentile level per SIP.
- (6) Limitations based on acute LTA ($LTA_{acute} < LTA_{chronic}$)

A 30-day period is a reasonable representation of a calendar month; Therefore, to comply with 40 CFR Section 122.45, 30 days is used as the duration of one month resulting in the 30-day average criteria being equal to average monthly limitations in this Order.

5. Correct Fact Sheet Section IV.C.3.r.ii., last paragraph, as follows:

A review of the Discharger’s monitoring reports shows an average effluent EC of 553 µmhos/cm, with a range from 340 µmhos/cm to 864 µmhos/cm, therefore indicating “reasonable potential” to cause or contribute to an exceedance of a water quality objective. The discharger submitted 771 sampling results from 1 August 2002 through 31 August 2005. The average effluent concentration of EC for the 771 samples is 553 µmhos/cm and the coefficient of variation among the sample results is 0.11. Therefore, when the data is plotted, it shows a fairly constant discharge concentration of EC without much variability. The data demonstrates that the Discharger is able to comply with a final EC monthly average effluent limitation of 700 µmhos/cm, as included in this Order, without a compliance schedule. The final effluent limitation is established as a water-quality-based effluent limitation to

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maintain the agricultural water quality goal in the receiving water. This Order contains a Special Provision in Section VI.C.1.c. for the Discharger to submit a ~~pollution prevention plan~~ salinity minimization plan for EC and identify alternatives to continue minimizing the salinity in the discharge.

6. Revise Fact Sheet Section IV.C.4.a. Table as follows:

<i>SMD #3 Wastewater Treatment Facility Order No. R5-2007____: Statistics for Effluent Constituents Exhibiting Reasonable Potential</i>						
Constituent	Max	Mean	Standard Deviation	CV ¹	# of Results	MEC
Ammonia (<u>µ</u> mg/L)	2.800	0.15435	0.23	4.662.08	297	3.388

7. Revise Fact Sheet Section IV.C.4.e. Table as follows:

Summary of Water Quality-based Effluent Limitations - Discharge Point D-001

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Ammonia, total (as N) 1 May thru 31 October	mg/L	0.86	--	2.5	--	--
	lbs/day ¹	2.15	--	6.3	--	--
Ammonia, total (as N) 1 November thru 30 April	mg/L	1.230	--	3.780	--	--
	lbs/day ¹	3.025	--	9.350	--	--

¹ Average Dry Weather flow of 0.3 mgd used to calculate mass limitations.

8. Revise Fact Sheet Section IV.D.1. Table as follows:

**Summary of Final Effluent Limitations
Discharge Point D-001**

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Ammonia, total (as N) 1 May thru 31 October	mg/L	1.230	--	3.780	--	--
	lbs/day ¹	3.025	--	9.350	--	--
Ammonia, total (as N) 1 November thru 30 April	mg/L	4.30	--	3.80	--	--
	lbs/day ¹	3.25	--	9.50	--	--