

**STATE OF CALIFORNIA  
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
LOS ANGELES REGION**

**TIME SCHEDULE ORDER NO. R4-2012-0007**

**REQUIRING CITY OF LOS ANGELES  
(DONALD C. TILLMAN WATER RECLAMATION PLANT)  
TO COMPLY WITH REQUIREMENTS PRESCRIBED IN  
ORDER NO. R4-2006-0091  
(NPDES PERMIT NO. CA0056227)**

The California Regional Water Quality Control Board, Los Angeles Region (Regional Water Board) finds:

1. The City of Los Angeles (City) owns and operates the Donald C. Tillman Water Reclamation Plant (Tillman WRP), a tertiary wastewater treatment plant located at 6100 Woodley Avenue, Van Nuys, California.
2. The Tillman WRP discharges tertiary-treated wastewater under waste discharge requirements contained in Order No. R4-2006-0091, adopted by this Regional Water Board on December 14, 2006. Order No. R4-2006-0091 serves as a permit under the National Pollutant Discharge Elimination System (NPDES No. CA0056227) and regulates the discharge of treated wastewater to Los Angeles River, a water of the United States and the State of California, within the Los Angeles River Watershed. Order No. R4-2006-0091 expired on November 10, 2011, but has been administratively extended.
3. On January 25, 2010, the Regional Water Board entered into a settlement agreement with the City in an effort to resolve lawsuits and petitions challenging the 1998 Permit (Order No. 98-046) and 2006 Permit (Order No. R4-2006-0091). The settlement agreement required that a variety of negotiated modifications to Order No. R4-2006-0091 be brought before the Regional Water Board for its consideration. The settlement agreement did not bind the Regional Water Board's judgment in consideration of those modifications, but the modifications did reflect staff recommendations. Order No. R4-2010-0060 adopted by this Regional Water Board on April 1, 2010, modifying Order No. R4-2006-0091, was the result of the public hearing on staff's proposals pursuant to the settlement agreement.
4. The Regional Water Board adopted a revised permit for the Tillman WRP at its December 8, 2011 hearing. Upon the effective date of the revised permit, Order Nos. R4-2006-0091 and R4-2010-0060 will expire.

5. The treatment system of the Tillman WRP consists of grit removal, screening, flow equalization, primary sedimentation, nitrification and denitrification (NDN<sup>1</sup>) activated sludge biological treatment with fine pore aeration, secondary clarification, coagulation, aqua diamond cloth filtration, disinfection by chlorination with the addition of ammonium hydroxide to form chloramine, and dechlorination.
6. Order Nos. R4-2006-0091 and R4-2010-0060 prescribe the following final effluent limitations in Table 1 for protection of aquatic life in the receiving water of the Los Angeles River:

**Table 1. Ammonia Effluent Limitations**

Constituent	Unit	Effluent Limitations	
		Monthly Average	Daily Maximum
Ammonia	mg/L	1.4	4.2

The ammonia effluent limitations for monthly average and daily maximum (1.4 mg/L and 4.2 mg/L, respectively) are based on the waste load allocations (WLAs) in the Los Angeles River Nitrogen Compounds Total Maximum Daily Loads (LA River Nitrogen Compounds TMDLs). These limitations have been effective since October 1, 2007, after the incorporation of the NDN process at Tillman WRP.

The previous Order No. 98-046 did not contain any ammonia effluent limitations.

7. The section 303(d) list of impaired waterbodies in California, as approved by the United States Environmental Protection Agency (USEPA), identifies ammonia as impacting the Los Angeles River, the receiving water for the Tillman WRP.
8. In 2003, the cities of Los Angeles and Burbank and the Sanitation Districts of Los Angeles County completed and submitted site-specific objective (SSO) study for ammonia in the Los Angeles River, the San Gabriel River, and the Santa Clara River watersheds. On June 7, 2007, the Regional Water Board adopted Resolution No. 2007-005, *Amendments to the Water Quality Control Plan-Los Angeles Region to Incorporate Site-Specific Objectives for Select Inland Surface Waters in the San Gabriel River, Los Angeles River and Santa Clara River Watersheds*. The Basin Plan amendment incorporated the results of the study as site-specific 30-day average objectives for ammonia along with corresponding site-specific early life stage implementation provisions. The State Water Resources Control Board, the California Office of Administrative Law

<sup>1</sup> In order to achieve compliance with the ammonia water quality objectives (WQOs) specified in the Water Quality Control Plan for the Los Angeles Region (Basin Plan), the City began to test different NDN treatments, including Modified Ludzack-Ettinger Process, Enhanced Modified Ludzack-Ettinger Process, and Step-Feed Process. The City completed construction of the NDN treatment facility in September 2007, and took 90 days to optimize operation of the NDN facilities.

(OAL), and USEPA approved the amendment on January 15, 2008; May 12, 2008; and March 30, 2009, respectively.

To date, the LA River Nitrogen Compounds TMDLs has not been revised to incorporate the ammonia SSO. Until the TMDL is revised, the permit for the Tillman WRP cannot be revised to incorporate the ammonia SSOs

9. On November 10, 2011, the City submitted a letter to the Regional Water Board requesting a Time Schedule Order (TSO) for the average monthly ammonia effluent limitation. The City listed the following as their reasons to justify their request for City's unique conditions:

A. Attainability of ammonia effluent limitations is challenging –

Compliance with the ammonia limits has proven to be challenging because of the nature of, and the requirements for, the operation of the NDN process and the need to comply with other effluent limitations that are inversely impacted by ammonia concentrations in the effluent. For example, the nitrification processes have the capability to remove the majority of ammonia present in the influent to the Tillman WRP. However, ammonia must be added back into the effluent prior to the disinfection process to reduce the formation of trihalomethanes. As a result, compliance with the effluent limits becomes uncertain and is not sustainable on a long-term basis, and the probability of exceeding the ammonia effluent limitations is likely.

B. Real-time ammonia analysis is infeasible –

The City needs to pursue alternative control measures to ensure long-term, sustainable compliance with the ammonia effluent limitations. These alternatives could include modifications to the operations of the Tillman WRP, further evaluation of technology for real-time ammonia monitoring, or modifications to the disinfection process. In order to determine the best long-term solution to this complex issue, the City needs time to evaluate the available options.

C. Ammonia SSOs in the Basin Plan amendment shall be applied –

Until the LA River Nitrogen Compounds TMDL targets and WLAs have been revised to reflect the revised ammonia objectives now that the SSOs are in effect, the ammonia effluent limitations in the NPDES permit for the Tillman WRP must be set equal to the existing TMDL ammonia WLAs. Additionally, the City provided information demonstrating that when the new Basin Plan ammonia SSOs are applied, the Los Angeles River is no longer impaired for ammonia and could be delisted.

10. Section 13300 of the CWC states:

"Whenever a regional board finds that a discharge of waste is taking place or threatening to take place that violates or will violate requirements prescribed by the regional board, or the state board, or that the waste collection, treatment, or disposal facilities of a discharger are approaching capacity, the board may require the discharger to submit for approval of the board, with such modifications as it may deem necessary, a detailed time schedule of specific actions the discharger shall take in order to correct or prevent a violation of requirements."

11. Based on a review of monitoring data, although the City has not yet violated the effluent limitation, they have been very close, and may not consistently achieve compliance with the final average monthly effluent limitation for ammonia in Order Nos. R4-2006-0091 and R4-2010-0060. Accordingly, pursuant to CWC section 13300, a discharge of waste is taking place and/or threatens to take place that violates requirements prescribed by the Regional Water Board.
12. Water Code section 13385, subdivisions (h) and (i), require the Regional Water Board to impose mandatory minimum penalties upon dischargers that violate certain effluent limitations. Section 13385(j)(3) exempts violations of an effluent limitation from mandatory minimum penalties "where the waste discharge is in compliance with either a cease and desist order issued pursuant to Section 13301 or a time schedule order issued pursuant to Section 13300, *if all of the [specified] requirements are met.*" (emphasis added).
13. In accordance with Water Code section 13385(j)(3)(B), to be exempt from mandatory minimum penalties, the TSO must determine that for any one of four reasons, the discharger is unable to consistently comply with one or more of the effluent limitations.
- A. Pursuant to Water Code section 13385(j)(3)(B)(i), the effluent limitation is a new, more stringent limitation that became applicable after adoption of the permit and requires new or modified control measures to comply.

The effluent limitations for ammonia in the 2006 permit for the Tillman WRP (Order Nos. R4-2006-0091 and R4-2010-0060) incorporate the LA River Nitrogen Compounds TMDL's ammonia WLAs. The effluent limitations for ammonia became effective on October 1, 2007. The previous permit (Order No. 98-046) did not include effluent limitations for ammonia.

It was necessary for the discharger to implement new or modified control measures to comply with the new effluent limitation in the 2006 permit.

Municipal wastewater treatment plants are complex systems, involving multiple biological and chemical processes. The control of ammonia in particular can have impacts on concentrations of other constituents in the effluent. The NDN process installed at the Tillman WRP has the capability to

remove the majority of ammonia present in the influent to the plant. However, ammonia must be added back into the effluent prior to the disinfection process to reduce the formation of trihalomethanes. Technology is not currently available to allow sufficient real-time monitoring of ammonia to optimize the ammonia add-back process. Additionally, the current operation of the NDN facilities requires more chemical and energy usage than would be necessary if the limits were less stringent.

NDN facilities were designed to treat the entire design capacity; however, due to disinfection requirements and to meet the Tillman WRP's concentration-time requirements, the Tillman WRP continues to treat less flow than the design capacity. These reduced treatment flows at the Tillman WRP have resulted in additional system and tank capacity that has allowed the Tillman WRP to operate at a higher efficiency. As the Tillman WRP increases flow, the impact on the NDN process and ammonia add-back requirements becomes more uncertain.

Analysis of Tillman WRP's ammonia effluent data indicates that there is only an 85 percent (see Finding No. 14) chance of long-term compliance with the ammonia effluent limits. Based on this analysis and the operational issues discussed above, the City would need to pursue alternative control measures to ensure long-term, sustainable compliance with the ammonia effluent limits. These alternatives could include modifications to the operations of the Tillman WRP, further evaluation of technology for real-time ammonia monitoring, or modifications to the disinfection process. In order to determine the best long-term solution to this complex issue, the City needs time to evaluate the available options and to implement alternative control measures to consistently comply with the effluent limitations for ammonia.

B. Pursuant to Water Code section 13385(j)(3)(B)(iii)(d), the Regional Water Board finds that new or modified measures to control the composition of the waste discharge cannot be designed, installed, and put into operation within 30 calendar days.

14. In order to issue a TSO, the Regional Board must determine that the discharge violates or threatens to violate ammonia effluent limitations.

The ammonia effluent concentrations in Table 2, collected between January 1, 2008 and March 31, 2011, consist of 39 data ranging from <0.05 mg/L to 1.4 mg/L.

**Table 2. Ammonia Effluent Concentrations**

<b>Ammonia Concentration Ranges (mg/L)</b>	<b>Number of Data</b>
1.3 - 1.4	10
1.2 - 1.3	4

1.1 - 1.2	12
1.0 - 1.1	5
0.9 - 1.0	4
0.8 - 0.9	2
0.0 - 0.8	2

Table 2 shows that the City is challenged to comply with the current ammonia monthly average effluent limitation (1.4 mg/L). Note the number of data points approaching the limits. In addition, based on the result of the normal distribution probability plot of 39 data using Minitab 14, it is anticipated that ammonia effluent concentrations may exceed the effluent limitation of 1.4 mg/L 15 percent of the time.

- Regional Water Board staff considered four options for determining interim ammonia monthly effluent limitation (as summarized in Table 3), based on effluent and receiving water monitoring data collected between January 1, 2008 and March 31, 2011. An interim ammonia monthly effluent limitation of 1.6 mg/L or 1.1 mg/L, based on the 95 percentile of effluent performance and a recalculation of the ammonia water quality objectives (as proposed by the City), respectively, will not help the City to avoid potential effluent violations. In addition, Heal the Bay disagrees with increasing the interim ammonia effluent limitation as high as would be allowed by the Ammonia SSO procedure, ranging from 4.6 mg/L to 6.1 mg/L. Therefore, this TSO assigns the interim ammonia monthly effluent limitation to be 2.2 mg/L, equal to the final ammonia effluent limitation for the Los Angeles-Glendale Water Reclamation Plant. This limit is protective of aquatic life and attainable by the City.

**Table 3. Options Considered for Determining Ammonia Interim Monthly Effluent Limitation**

Calculation Option	Interim Monthly Effluent Limitation (mg/L)
1. 95th Percentile (Performance-based)	1.6 <sup>2</sup>
2. Ammonia SSO (Effluent Data-based)	
Discharge Points 001, 002, and 003	
April 1 – September 30	4.6 <sup>3</sup>
October 1 – March 31	6.1 <sup>3</sup>
Discharge Point 008	

<sup>2</sup> Based on the result of 95 percentile, using Minitab.  
<sup>3</sup> See calculation in Attachment A.

Year Round	5.2 <sup>3</sup>
3. Ammonia SSO (Receiving Water Data-based)	
Discharge Point 008	
Year Round	1.1 <sup>3</sup>
4. Los Angeles–Glendale Water Reclamation Plant	2.2

16. Pursuant to CWC section 13385(j)(3), full compliance with the requirements of this TSO exempts the City from mandatory minimum penalties only for violations of the final effluent limitation for ammonia in Order Nos. R4-2006-0091 and R4-2010-0060 that occur after the effective date of this TSO.
17. This TSO includes interim requirements and the dates for their achievement. The interim requirements include both an interim effluent limitation for ammonia and actions and milestones leading to compliance with the final effluent limitation for this pollutant.
18. Consistent with Water Code section 13385(j)(3)(C), the TSO extends the time for compliance until September 30, 2012, five years after the effective date of the ammonia effluent limitations contained in the 2006 permit. The TSO includes an interim effluent limitation and actions and milestones to achieve compliance with the limitation.
19. This TSO concerns an existing facility and does not significantly alter the status with respect to the facility. This TSO is also being taken for the protection of the environment. Therefore, issuance of this TSO is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21100, *et seq.*) in accordance with sections 15301 and 15321(a)(2) of Title 14 of the California Code of Regulations (CCR).
20. The Regional Water Board has notified the City and interested agencies and persons of its intent to issue this TSO concerning compliance with waste discharge requirements. The Regional Water Board, during a public comment period, received and considered all comments to this matter.
21. To provide the City with interim ammonia effluent, Regional Water Board staff prepared a tentative TSO, circulated it for public comment, received comments, responded to those comments, subsequently distributed a revised tentative TSO, and noticed consideration of the TSO for the Executive Officer to issue on February 2, 2012.
22. Any person aggrieved by this action of the Regional Water Board may petition the State Water Board to review the action in accordance with CWC section 13320 and CCR, title 23, sections 2050 and following. The State Water Board must *receive* the

petition by 5:00 p.m., 30 days after the Regional Water Board action, except that if the thirtieth day following the action falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the Internet at [http://www.waterboards.ca.gov/public\\_notices/petitions/water\\_quality](http://www.waterboards.ca.gov/public_notices/petitions/water_quality) or will be provided upon request.

**IT IS HEREBY ORDERED** that, pursuant to CWC section 13300 and 13385(j)(3), the City of Los Angeles, as owner and operator of the Tillman WRP, shall comply with the requirements listed below to ensure compliance with the final effluent limitation for ammonia contained in Order Nos. R4-2006-0091 and R4-2010-0060:

1. Comply immediately with the interim effluent limit in Table 4, which shall be deemed effective from the date of this Order until September 30, 2012:

**Table 4. Interim Ammonia Effluent Limitation**

Constituent	Units	Monthly Average
Ammonia (year round)	mg/L	2.2

2. Achieve full compliance with the final effluent limitation as soon as possible, but no later than September 30, 2012.
3. Submit quarterly progress reports of efforts taken by the City towards achieving compliance with the final effluent limits for ammonia. The reports shall summarize the progress to date, activities conducted during that quarter, and the activities planned for the upcoming quarters. The reports shall also state whether or not the Tillman WRP was in compliance with the interim effluent limitations for ammonia during the reporting period. Each quarterly report shall be received by the Regional Water Board by the 15<sup>th</sup> day of the first month following the reporting period (April 15, July 15, and October 15). The first progress report shall be received by the Regional Water Board by April 15, 2012, and will cover the months of February 2012 through March 2012.

The progress reports shall detail any actions taken to support incorporation of the current Basin Plan ammonia and/or revisions to the 303(d) list, studies, facility modifications, and recommendations for additional measures, if necessary, to achieve full compliance with applicable final effluent limits.

4. All technical and monitoring reports required under this TSO are required pursuant to CWC sections 13267 and 13383. The Regional Water Board needs the required information in order to determine compliance with this TSO and Order No. R4-2006-0091. The Regional Water Board believes that the

burdens, including costs, of these reports bear a reasonable relationship to the needs for the reports and the benefits to be obtained from the reports.

5. Any person signing a document submitted under this TSO shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

6. If the City fails to comply with any provision of this TSO, the Regional Water Board may take any further action authorized by law. The Executive Officer, or his/her delegate, is authorized to take appropriate enforcement action pursuant, but not limited to, CWC sections 13350 and 13385. The Regional Water Board may also refer any violations to the Attorney General for judicial enforcement, including injunction and civil monetary remedies.
7. All other provisions of NPDES Order Nos. R4-2006-0091 and R4-2010-0060, and R4-2012-0007 not in conflict with this TSO are in full force and effect.
8. The Regional Water Board may reopen this TSO at its discretion or at the request of the City, if warranted. Lack of progress towards compliance with this TSO may be cause for the Regional Water Board to modify the conditions of this TSO.
9. This TSO becomes effective immediately upon adoption by the Regional Water Board. This TSO expires on October 1, 2012.

I, Samuel Unger, Executive Officer, do hereby certify that the foregoing is a full, true and correct copy of an order adopted by the Executive Officer pursuant to delegated authority by the California Regional Water Quality Control Board, Los Angeles Region, on February 2, 2012.

  
Samuel Unger, P.E.  
Executive Officer

**Attachment A**  
**Calculation Summary of Interim Ammonia Limitations Using**  
**Los Angeles River Reaches 4 & 5 Site-Specific Objectives**

**I. Ammonia Site-Specific Objectives**

**A. For Discharge Points 001, 002, and 003 Located at Los Angeles River Reach 5 (Sepulveda Basin)**

$$\text{One-hour Average Objective} = \frac{0.411}{1+10^{7.204-\text{pH}}} + \frac{58.4}{1+10^{\text{pH}-7.204}} \dots\dots\dots \text{Eq. 1}$$

**30-day Average Objective (from April 1 to September 30) =**

$$\left( \frac{0.0676}{1+10^{7.688-\text{pH}}} + \frac{2.912}{1+10^{\text{pH}-7.688}} \right) \times 0.854 \times \text{MIN}(2.85, 2.85 \times 10^{0.028 \times (25-T)}) \dots\dots\dots \text{Eq. 2}$$

**30-day Average Objective (from October 1 to March 31) =**

$$\left( \frac{0.0676}{1+10^{7.688-\text{pH}}} + \frac{2.912}{1+10^{\text{pH}-7.688}} \right) \times 0.854 \times 2.85 \times 10^{0.028 \times (25-\text{MAX}(T,7))} \dots\dots\dots \text{Eq. 3}$$

Where T = temperature expressed in °C.

**B. For Discharge Point 008 Located at Los Angeles River Reach 4 (Sepulveda Dam to Riverside Drive)**

**One-hour Average Objective = Eq. 1**

**30-day Average Objective (year round) =**

$$\left( \frac{0.0676}{1+10^{7.688-\text{pH}}} + \frac{2.912}{1+10^{\text{pH}-7.688}} \right) \times 0.854 \times 2.85 \times 10^{0.028 \times (25-\text{MAX}(T,7))} \dots\dots\dots \text{Eq. 4}$$

Where T = temperature expressed in °C:

**II. Calculation of Interim Ammonia Effluent Limitations at Eff-001A, Based on Effluent Data collected Between January 1, 2008 and March 31, 2011**

**A. For Los Angeles River Reach 5 –**

Only Eq. 1, Eq. 2, and Eq.3 are used to conduct the interim ammonia effluent limitations, because the Donald C. Tillman Water Reclamation Plant's Effluent

Transfer Station Eff-001A via Discharge Points 001, 002, and 003 is located within Los Angeles River Reach 5.

**1. Interim Ammonia Effluent Limitations from April 1 to September 30 for Early Life Stage (ELS) Present**

**Step 1** – Identify applicable ammonia water quality Objectives (WQOs).

From the Discharger's effluent between April 1 and September 30, the following data are summarized below:

pH = 7.3 at 90th percentile (for One-hour Average Objective)

pH = 7.25 at 50th percentile (for 30-day Average Objective)

Temperature = 26.39 °C at 50th percentile (for 30-day Average Objective)

When pH is equal to 7.3;

One-hour Average Objective (Eq. 1) = 26.21 mg/L

When pH = 7.25 and temperature = 26.39 °C;

30-day Average Objective (Eq. 2) = 4.79 mg/L

From Basin Plan amendment;

4-day Average Objective = 2.5 times the 30-day average objective = 2.5 X  
4.79 mg/L = 11.97 mg/L

Ammonia WQO Summary:

One-hour Average = 26.21 mg/L

Four-day Average = 11.97 mg/L

30-day Average = 4.79 mg/L

**Step 2** – For each water quality objective, calculate the effluent concentration allowance (ECA) using the steady-state mass balance model. Since mixing has not been allowed by the Regional Water Board, this equation applies:

$ECA = WQO$

**Step 3** – Determine the Long-Term Average discharge condition (LTA) by multiplying each ECA with a factor (multiplier) that adjust for variability.

ECA multiplier when CV = 0.2796

ECA multiplier<sub>1-hour99</sub> = 0.5486

ECA multiplier<sub>4-day99</sub> = 0.7306

$$\text{ECA multiplier}_{30\text{-day}99} = 0.8893$$

Using the LTA equations:

$$\begin{aligned} \text{LTA}_{1\text{-hour}/99} &= \text{ECA}_{1\text{-hour}} \times \text{ECA multiplier}_{1\text{-hour}99} = 26.21 \text{ mg/L} \times 0.5486 \\ &= 14.38 \text{ mg/L} \\ \text{LTA}_{4\text{-day}/99} &= \text{ECA}_{4\text{-day}} \times \text{ECA multiplier}_{4\text{-day}99} = 11.97 \text{ mg/L} \times 0.7306 \\ &= 8.75 \text{ mg/L} \\ \text{LTA}_{30\text{-day}/99} &= \text{ECA}_{30\text{-day}} \times \text{ECA multiplier}_{30\text{-day}99} = 4.79 \text{ mg/L} \times 0.8893 \\ &= 4.26 \text{ mg/L} \end{aligned}$$

**Step 4** – Select the (most limiting) of the LTAs derived in Step 3 ( $\text{LTA}_{\min}$ )

$$\text{LTA}_{\min} = 4.26 \text{ mg/L}$$

**Step 5** – Calculate water quality based effluent limitations for monthly average (AMEL) and daily maximum (MDEL) by multiplying  $\text{LTA}_{\min}$  as selected in Step 4 with a factor (multiplier).

Monthly sampling frequency ( $n$ ) is 30 times per month or less, and the minimum LTA is the  $\text{LTA}_{30\text{-day}/99}$ , therefore  $n = 30$ ,  $\text{CV} = 0.2796$ .

$$\begin{aligned} \text{AMEL multiplier}_{95} &= 1.0861 \\ \text{MDEL multiplier}_{99} &= 1.8230 \end{aligned}$$

$$\begin{aligned} \text{AMEL} &= \text{LTA}_{\min} \times \text{AMEL multiplier}_{95} = 4.26 \text{ mg/L} \times 1.0861 = 4.63 \text{ mg/L} \\ &\cong 4.6 \text{ mg/L} \\ \text{MDEL} &= \text{LTA}_{\min} \times \text{MDEL multiplier}_{99} = 4.26 \text{ mg/L} \times 1.8230 = 7.77 \text{ mg/L} \\ &\cong 7.8 \text{ mg/L} \end{aligned}$$

## 2. Interim Ammonia Effluent Limitations from October 1 to March 31 for ELS Absent

**Step 1** – Identify applicable ammonia WQOs.

From the Discharger's effluent between October 1 and March 31, the following data are summarized below:

pH = 7.3 at 90th percentile (for One-hour Average Objective)  
pH = 7.2 at 50th percentile (for 30-day Average Objective)  
Temperature = 22.78 °C at 50th percentile (for 30-day Average Objective)

When pH is equal to 7.3;  
One-hour Average Objective (Eq. 1) = 26.21 mg/L

When pH = 7.2 and temperature = 22.78 °C;  
30-day Average Objective (Eq. 3) = 6.22 mg/L

From Basin Plan amendment;

4-day Average Objective = 2.5 times the 30-day average objective = 2.5 X  
6.22 mg/L = 15.55 mg/L

Ammonia WQO Summary:

One-hour Average = 26.21 mg/L  
Four-day Average = 15.55 mg/L  
30-day Average = 6.22 mg/L

**Step 2** – For each water quality objective, calculate the effluent concentration allowance (ECA) using the steady-state mass balance model. Since mixing has not been allowed by the Regional Water Board, this equation applies:

$$ECA = WQO$$

**Step 3** – Determine the Long-Term Average discharge condition (LTA) by multiplying each ECA with a factor (multiplier) that adjust for variability.

ECA multiplier when CV = 0.2066

$$\begin{aligned} \text{ECA multiplier}_{1\text{-hour}99} &= 0.6347 \\ \text{ECA multiplier}_{4\text{-day}99} &= 0.7911 \\ \text{ECA multiplier}_{30\text{-day}99} &= 0.9167 \end{aligned}$$

Using the LTA equations:

$$\begin{aligned} \text{LTA}_{1\text{-hour}/99} &= \text{ECA}_{1\text{-hour}} \times \text{ECA multiplier}_{1\text{-hour}99} = 26.21 \text{ mg/L} \times 0.6347 \\ &= 16.64 \text{ mg/L} \\ \text{LTA}_{4\text{-day}/99} &= \text{ECA}_{4\text{-day}} \times \text{ECA multiplier}_{4\text{-day}99} = 15.55 \text{ mg/L} \times 0.7911 \\ &= 12.30 \text{ mg/L} \\ \text{LTA}_{30\text{-day}/99} &= \text{ECA}_{30\text{-day}} \times \text{ECA multiplier}_{30\text{-day}99} = 6.22 \text{ mg/L} \times 0.9167 \\ &= 5.70 \text{ mg/L} \end{aligned}$$

**Step 4** – Select the (most limiting) of the LTAs derived in Step 3 ( $LTA_{\min}$ )  
 $LTA_{\min} = 5.70 \text{ mg/L}$

**Step 5** – Calculate water quality based effluent limitations for AMEL and MDEL by multiplying  $LTA_{\min}$  as selected in Step 4 with a factor (multiplier).

Monthly sampling frequency (n) is 30 times per month or less, and the minimum LTA is the  $LTA_{30\text{-day}/99}$ , therefore  $n = 30$ ,  $CV = 0.2066$ .

$$\text{AMEL multiplier}_{95} = 1.0632$$

$$\text{MDEL multiplier}_{99} = 1.5756$$

$$\begin{aligned} \text{AMEL} &= LTA_{\min} \times \text{AMEL multiplier}_{95} = 5.70 \text{ mg/L} \times 1.0632 &= 6.06 \text{ mg/L} \\ & &\cong 6.1 \text{ mg/L} \end{aligned}$$

$$\begin{aligned} \text{MDEL} &= LTA_{\min} \times \text{MDEL multiplier}_{99} = 5.70 \text{ mg/L} \times 1.5756 &= 8.98 \text{ mg/L} \\ & &\cong 9.0 \text{ mg/L} \end{aligned}$$

## B. For Los Angeles River Reach 4 –

Only Eq. 1 and Eq.4 are used to conduct the interim ammonia effluent limitations, because the Donald C. Tillman Water Reclamation Plant's Effluent Transfer Station Eff-001A via Discharge Point 008 is located within Los Angeles River Reach 4.

### 1. Year Round Interim Ammonia Effluent Limitations for ELS Absent

**Step 1** – Identify applicable ammonia WQOs.

From the Discharger's effluent, the following data are summarized below:

pH = 7.3 at 90th percentile (for One-hour Average Objective)

pH = 7.2 at 50th percentile (for 30-day Average Objective)

Temperature = 25.00 °C at 50th percentile (for 30-day Average Objective)

When pH is equal to 7.3;

One-hour Average Objective (Eq. 1) = 26.21 mg/L

When pH = 7.2 and temperature = 25.00 °C;

30-day Average Objective (Eq. 3) = 5.39 mg/L

From Basin Plan amendment;

4-day Average Objective = 2.5 times the 30-day average objective = 2.5 X  
5.39 mg/L = 13.47 mg/L

Ammonia WQO Summary:

One-hour Average = 26.21 mg/L

Four-day Average = 13.47 mg/L

30-day Average = 5.39 mg/L

**Step 2** – For each water quality objective, calculate the effluent concentration allowance (ECA) using the steady-state mass balance model. Since mixing has not been allowed by the Regional Water Board, this equation applies:

$$ECA = WQO$$

**Step 3** – Determine the Long-Term Average discharge condition (LTA) by multiplying each ECA with a factor (multiplier) that adjust for variability.

ECA multiplier when CV = 0.2409

$$ECA \text{ multiplier}_{1\text{-hour}99} = 0.5919$$

$$ECA \text{ multiplier}_{4\text{-day}99} = 0.7618$$

$$ECA \text{ multiplier}_{30\text{-day}99} = 0.9037$$

Using the LTA equations:

$$\begin{aligned} LTA_{1\text{-hour}/99} &= ECA_{1\text{-hour}} \times ECA \text{ multiplier}_{1\text{-hour}99} = 26.21 \text{ mg/L} \times 0.5919 \\ &= 15.52 \text{ mg/L} \end{aligned}$$

$$\begin{aligned} LTA_{4\text{-day}/99} &= ECA_{4\text{-day}} \times ECA \text{ multiplier}_{4\text{-day}99} = 13.47 \text{ mg/L} \times 0.7618 \\ &= 10.26 \text{ mg/L} \end{aligned}$$

$$\begin{aligned} LTA_{30\text{-day}/99} &= ECA_{30\text{-day}} \times ECA \text{ multiplier}_{30\text{-day}99} = 5.39 \text{ mg/L} \times 0.9037 \\ &= 4.87 \text{ mg/L} \end{aligned}$$

**Step 4** – Select the (most limiting) of the LTAs derived in Step 3 ( $LTA_{\min}$ )  
 $LTA_{\min} = 4.87 \text{ mg/L}$

**Step 5** – Calculate water quality based effluent limitations for AMEL and MDEL by multiplying  $LTA_{\min}$  as selected in Step 4 with a factor (multiplier).

Monthly sampling frequency (n) is 30 times per month or less, and the minimum LTA is the  $LTA_{30\text{-day}/99}$ , therefore  $n = 30$ ,  $CV = 0.2409$ .

$$AMEL \text{ multiplier}_{95} = 1.0740$$

$$MDEL \text{ multiplier}_{99} = 1.6893$$

$$\begin{aligned} AMEL &= LTA_{\min} \times AMEL \text{ multiplier}_{95} = 4.87 \text{ mg/L} \times 1.0740 = 5.23 \text{ mg/L} \\ &\cong 5.2 \text{ mg/L} \end{aligned}$$

$$\begin{aligned} MDEL &= LTA_{\min} \times MDEL \text{ multiplier}_{99} = 4.87 \text{ mg/L} \times 1.6893 = 8.23 \text{ mg/L} \\ &\cong 8.2 \text{ mg/L} \end{aligned}$$

### III. Calculation of Interim Ammonia Effluent Limitations at Eff-001A, Based on Receiving Water Data Collected Between January 1, 2008 and March 31, 2011

The receiving water data collected between January 1, 2008 and March 31, 2011 at Receiving Water Monitoring Station RSW-LATT630 (R-7) were used to conduct ammonia monthly effluent limitation. RSW-LATT630 (R-7) is located within Los Angeles River Reach 4, therefore, Eq. 1 and Eq.4 are used to conduct the interim ammonia effluent limitations.

**A. For Los Angeles River Reach 4 –**

**1. Year Round Interim Ammonia Effluent Limitations for ELS Absent**

**Step 1 – Identify applicable ammonia WQOs.**

From the Discharger's effluent, the following data are summarized below:

pH = 8.47 at 90th percentile (for One-hour Average Objective)  
pH = 8.20 at 50th percentile (for 30-day Average Objective)  
Temperature = 19.63 °C at 50th percentile (for 30-day Average Objective)

When pH is equal to 8.47;  
One-hour Average Objective (Eq. 1) = 3.37 mg/L

When pH = 8.20 and temperature = 19.63 °C;  
30-day Average Objective (Eq. 3) = 2.54 mg/L

From Basin Plan amendment;

4-day Average Objective = 2.5 times the 30-day average objective = 2.5 X  
2.54 mg/L = 6.34 mg/L

Ammonia WQO Summary:

One-hour Average = 3.37 mg/L  
Four-day Average = 6.34 mg/L  
30-day Average = 2.54 mg/L

**Step 2 –** For each water quality objective, calculate the effluent concentration allowance (ECA) using the steady-state mass balance model. Since mixing has not been allowed by the Regional Water Board, this equation applies:

$$\text{ECA} = \text{WQO}$$

**Step 3 –** Determine the Long-Term Average discharge condition (LTA) by multiplying each ECA with a factor (multiplier) that adjust for variability.

ECA multiplier when CV = 0.7165

$$\text{ECA multiplier}_{1\text{-hour}99} = 0.2753$$

$$\text{ECA multiplier}_{4\text{-day}99} = 0.4734$$

$$\text{ECA multiplier}_{30\text{-day}99} = 0.7449$$

Using the LTA equations:

$$\begin{aligned} \text{LTA}_{1\text{-hour}/99} &= \text{ECA}_{1\text{-hour}} \times \text{ECA multiplier}_{1\text{-hour}99} = 3.37 \text{ mg/L} \times 0.2753 \\ &= 0.93 \text{ mg/L} \end{aligned}$$

$$\begin{aligned} \text{LTA}_{4\text{-day}/99} &= \text{ECA}_{4\text{-day}} \times \text{ECA multiplier}_{4\text{-day}99} = 6.34 \text{ mg/L} \times 0.4734 \\ &= 3.00 \text{ mg/L} \end{aligned}$$

$$\begin{aligned} \text{LTA}_{30\text{-day}/99} &= \text{ECA}_{30\text{-day}} \times \text{ECA multiplier}_{30\text{-day}99} = 2.54 \text{ mg/L} \times 0.7449 \\ &= 1.89 \text{ mg/L} \end{aligned}$$

**Step 4** – Select the (most limiting) of the LTAs derived in Step 3 ( $\text{LTA}_{\min}$ )  
 $\text{LTA}_{\min} = 4.87 \text{ mg/L}$

**Step 5** – Calculate water quality based effluent limitations for AMEL and MDEL by multiplying  $\text{LTA}_{\min}$  as selected in Step 4 with a factor (multiplier).

Monthly sampling frequency (n) is 30 times per month or less, and the minimum LTA is the  $\text{LTA}_{30\text{-day}/99}$ , therefore  $n = 30$ ,  $\text{CV} = 0.7165$ .

$$\text{AMEL multiplier}_{95} = 1.2285$$

$$\text{MDEL multiplier}_{99} = 3.6330$$

$$\begin{aligned} \text{AMEL} &= \text{LTA}_{\min} \times \text{AMEL multiplier}_{95} = 0.93 \text{ mg/L} \times 1.2285 = 1.14 \text{ mg/L} \\ &\cong 1.1 \text{ mg/L} \end{aligned}$$

$$\begin{aligned} \text{MDEL} &= \text{LTA}_{\min} \times \text{MDEL multiplier}_{99} = 0.93 \text{ mg/L} \times 3.6330 = 3.37 \text{ mg/L} \\ &\cong 3.3 \text{ mg/L} \end{aligned}$$