

Appendix C

Response to Comments

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION**

RESPONSE TO WRITTEN COMMENTS

On Tentative Order for
Sunnyvale Water Pollution Control Plant and Wastewater Collection System
Sunnyvale, Santa Clara County

The Regional Water Board received written comments on a tentative order distributed for public comment on June 27, 2014, from the City of Sunnyvale and the Bay Area Clean Water Agencies.

Regional Water Board staff has summarized the comments shown below in *italics* (paraphrased for brevity) and followed each comment with staff's response. For the full content and context of the comments, refer to the comment letters.

This document also contains staff-initiated revisions.

All revisions to the tentative order are shown with underline text for additions and strikethrough ~~text~~ for deletions.

City of Sunnyvale

Sunnyvale Comment 1

Sunnyvale objects to receiving water monitoring requirements that are in addition to participation in the Regional Monitoring Program (RMP). Sunnyvale contends that such additional receiving water monitoring requirements are new and will not generate useful information. It requests that permit-specific receiving water monitoring requirements be removed from the tentative order for the following reasons:

- 1. RMP monitoring has demonstrated that un-ionized ammonia toxicity is not a problem in San Francisco Bay.*
- 2. The Regional Water Board required extensive receiving water characterization studies in 1998 and 2009. Both studies, dated 2001 and 2012, demonstrated that receiving waters comply with Basin Plan water quality objectives. Effluent quality has not changed since these studies were completed.*
- 3. Current effluent data do not demonstrate reasonable potential for un-ionized ammonia to exceed water quality standards.*
- 4. Sampling at a single location would not provide information useful in establishing an ammonia mixing zone.*
- 5. Data from a more distant monitoring location would better represent background conditions.*
- 6. Moffett Channel is not readily accessible for sampling from its banks. Quarterly sampling could cost about \$20,000 annually in addition to the costs recently required for PCBs and nutrients monitoring. Sunnyvale believes the additional monitoring is inconsistent with State Water Board Resolution No. 2013-0029, "Directing Actions in Response to Efforts by Stakeholders on Reducing Costs of Compliance While Maintaining Water Quality Protection."*

7. *Existing Moffett Channel data demonstrate that receiving water hardness is well above 400 mg/L, the upper bound for calculating freshwater quality objectives.*

Response to Sunnyvale Comment 1

We disagree for the most part. However, as explained below, we revised the tentative order to move the receiving water monitoring location farther from the outfall, to require more frequent monitoring over a much shorter period, and to eliminate the requirements to monitor hardness and standard observations. We also revised the tentative order to allow Sunnyvale to conduct the monitoring on its own, to rely on the RMP, or to propose an alternative approach that serves the same purpose. For example, the U.S. Geological Survey is considering working with the RMP to monitor nearby waters, and Sunnyvale could work with these parties to ensure that similar data are collected.

The requirement to monitor ammonia in receiving waters in addition to RMP participation is not new. The previous order (Order No. R2-2009-0061, provision VI.C.2.e) required a comprehensive two-year ammonia characterization study that covered approximately 5.5 miles of waterways in Moffett Channel and Guadalupe Slough. The revised tentative order focuses only on a segment of water approximately 5,000 feet in length between RMP monitoring station C-1-3 and Sunnyvale monitoring station C-2-0, near the confluence of Guadalupe Slough and Moffett Channel (see the figure in Attachment B of the revised tentative order). The results of the 2012 study indicate that the highest un-ionized ammonia concentrations occur in these areas, not closer to the outfall in Moffett Channel.

As for receiving water hardness, we agree that the typical hardness is likely to remain well above 400 mg/L. The median hardness in waters near the confluence of Guadalupe Slough and Moffett Channel is about 2,000 mg/l. The California Toxics Rule recommends against using values above 400 mg/L to calculate freshwater quality objectives so additional hardness monitoring is unnecessary.

We also eliminated the requirement to monitor standard observations because such observations would not provide useful information if conducted at the revised, more distant monitoring location.

Our responses to Sunnyvale's specific comments are provided below:

1. Sunnyvale claims that RMP monitoring has demonstrated that un-ionized ammonia toxicity is not a problem in San Francisco Bay. However, no RMP monitoring has taken place anywhere near Sunnyvale's outfall since 2002 (the RMP last monitored station C-1-3, the RMP station nearest to the outfall, on July 23, 2002). Moreover, the highest annual median un-ionized ammonia concentration measured near the confluence of Guadalupe Slough and Moffett Channel was 0.015 mg/L. This concentration is relatively close to the annual median water quality objective of 0.025 mg/L, so careful surveillance is warranted.
2. Sunnyvale claims that the 2001 and 2012 studies demonstrated that receiving waters comply with Basin Plan water quality objectives and that effluent quality has not changed since the studies were completed. We agree, but as explained above, careful surveillance through up-to-date monitoring is warranted because at some locations the median un-ionized ammonia concentration is quite close to the annual median water quality objective and because available data do not necessarily represent all climate and tidal conditions.
3. Sunnyvale claims that current effluent data do not demonstrate reasonable potential. We agree; however, without considering receiving water conditions, and how the effluent changes when discharged into the receiving water, the effluent data analysis is insufficient. Ammonia exists in

ionized and un-ionized forms, and the fraction taking each form depends on pH, temperature, and salinity. The un-ionized ammonia fraction is much higher after discharge due to the receiving water conditions. Fact Sheet section IV.C.3.e.ii.(d)(1) assesses un-ionized ammonia in effluent for completeness, but the analysis should not be considered without the context provided in Fact Sheet section IV.C.3.e.ii.(d)(2), where we also assess un-ionized ammonia in receiving waters resulting from the discharge.

4. Sunnyvale claims that sampling at a single location would not be useful in establishing an ammonia mixing zone. We agree; however, the purpose of the proposed monitoring is not to develop a mixing zone. Because the revised tentative order finds no reasonable potential for ammonia, it contains no water quality-based effluent limits for ammonia, and no mixing zone is needed.
5. Sunnyvale claims that data from a more distant monitoring location would better represent background conditions. However, the purpose of the proposed monitoring is not to determine background conditions. The revised tentative order does not contain water quality-based effluent limits for ammonia, so it does not contain limits based on dilution, and therefore a background concentration is not needed.
6. Sunnyvale claims that the proposed monitoring would cost too much. However, we believe it could cost Sunnyvale considerably less than Sunnyvale’s \$20,000-per-year estimate because the revised tentative order limits the monitoring to one year and provides Sunnyvale with substantial flexibility to leverage existing programs, such as the RMP, or potential future ones, such as a possible collaboration with the U.S. Geological Survey.
7. Sunnyvale claims that monitoring receiving water hardness is unnecessary, and we agree. We revised the tentative order as indicated below.

Our revisions to the tentative order are shown below.

We revised Monitoring and Reporting Program Table E-1 as follows:

Type of Sampling Location	Monitoring Location Name	Monitoring Location Description
Influent	INF-001	Any point in treatment facility headworks at which all waste tributary to the treatment system is present and preceding any phase of treatment.
Effluent	EFF-001	Any point in treatment facility outfall, following treatment, including disinfection, and before contact with receiving water, where all waste streams tributary to Discharge Point No. 001 are present.
Receiving Water	RSW-001	Any point in Moffett Channel within 500 feet down gradient of Discharge Point No. 001 <u>Any point at or between RMP monitoring station C-1-3 and Sunnyvale monitoring station C-2-0 in the vicinity of the confluence of Guadalupe Slough and Moffett Channel.</u>
Biosolids	BIO-001	Biosolids (treated sludge)

We revised Monitoring and Reporting Program section VI (Receiving Water Monitoring Requirements), including Table E-4, as follows:

The Discharger shall continue to participate in the Regional Monitoring Program (RMP), which collects data on pollutants and toxicity in San Francisco Bay water, sediment, and

biota. The Discharger shall also monitor receiving waters at Monitoring Location RSW-001 as follows:

Table E-4. Receiving Water Monitoring

Parameter	Units	Sample Type	Minimum Sampling Frequency
Salinity	ppt	Grab	^[1] 1/Quarter
Hardness	mg/L as CaCO ₃	Grab	1/Quarter
Temperature	°C	Grab	^[1] 1/Quarter
pH	standard units	Grab	^[1] 1/Quarter
Total Ammonia Nitrogen	mg/L	Grab	^[1] 1/Quarter
Standard Observations ^[H]	--	--	1/Quarter

Unit Abbreviations:

ppt = parts per thousand
 mg/L = milligrams per liter
 °C = degrees Celsius

Sampling Frequency:

^[1] 1/Quarter = Once per calendar month for a year quarter or at a frequency acceptable to the Executive Officer that is representative of the receiving water and seasonal variability.

Footnote:

^[H] Standard observations are specified in Attachment G section III.C.

The Discharger may conduct this receiving water monitoring on its own or rely upon equivalent data obtained following another alternative approach through the RMP or in coordination with others. Before pursuing an alternative approach, the Discharger shall first obtain written concurrence from the Executive Officer that the alternative approach is equivalent to the monitoring described above. The Discharger shall then submit the data in a report with its application for permit reissuance.

We revised Fact Sheet section VII.A.4 as follows:

Receiving Water Monitoring. The Discharger is required to continue participating in the RMP, which involves collecting data on pollutants and toxicity in San Francisco Bay water, sediment, and biota. This monitoring is necessary to characterize the receiving water and the effects of the discharges authorized in this Order. The Discharger is also required to monitor receiving waters at or between RMP monitoring station C-1-3 and Sunnyvale station C-2-0 near the confluence of Guadalupe Slough and Moffett Channel to provide data necessary for reasonable potential analyses and WQBEL development. ~~For example, ammonia monitoring is necessary to conduct reasonable potential analyses, and hardness data is needed to determine water quality objectives. This is the area where the highest un-ionized ammonia would be expected based on the Discharger's Receiving Water Ammonia Characterization Study – Final Report, dated April 15, 2012.~~

We revised Fact Sheet Table 9 as follows:

Table F-9. Monitoring Requirements Summary

Parameter	Influent INF-001	Effluent EFF-001	Receiving Water RSW-001	Biosolids BIO-001
Flow	---	Continuous/D	---	---
Temperature	---	1/Month	^[1] 1/Quarter	---
CBOD ₅	1/Week	1/Week	---	---
⋮	⋮	⋮	⋮	⋮
Oil and Grease	---	1/Quarter	---	---
pH	---	Continuous/D or 1/Day	^[1] 1/Quarter	---
Turbidity	---	1/Week	---	---
⋮	⋮	⋮	⋮	⋮
Enterococcus	--	5/Week		---
Ammonia, Total	---	1/Week (October-April) 1/Month (May-September)	^[1] 1/Quarter	---
Copper, Total Recoverable	---	1/Month	Support RMP	---
⋮	⋮	⋮	⋮	⋮
Remaining Priority Pollutants	---	2/Year	Support RMP	---
Standard Observations	---	1/Week	1/Quarter	---
Salinity	---	---	^[1] 1/Quarter	---
Hardness	---	---	1/Quarter	---
Volatile Organic Compounds	2/Year	2/Year	---	2/Year
⋮	⋮	⋮	⋮	⋮

Footnote:

^[1] Once per calendar month for a year or at a frequency acceptable to the Executive Officer that is representative of the receiving water and seasonal variability.

Sunnyvale Comment 2

Sunnyvale requests a return to the previous order’s requirement for reporting chlorine residual concentrations based only on “on-the-hour” readings. Sunnyvale points out that the use of “on-the-hour” readings reflects a strategy developed between Regional Water Board staff and the Bay Area Clean Water Agencies in 2004. It notes that the requirements in permits issued as recently as May 2014 differ from those in this revised tentative order. Sunnyvale also requests that Monitoring and Reporting Program Table E-3 define sample type “Continuous/H” as “measured continuously, or at a minimum hourly.”

Response to Sunnyvale Comment 2

We revised Table 4, footnote 2 to return to “on-the-hour” readings but added a requirement to also describe in the monitoring report transmittal letter any valid between-the-hour excursions. This addition is consistent with the 2004 strategy. The strategy’s sole intent was, by limiting the number of potential violations subject to mandatory minimum penalty to just once per hour, to not discourage dischargers from monitoring chlorine continuously. This puts those monitoring continuously at no more risk of mandatory minimum penalties than those monitoring hourly. Additionally, the revised language clarifies that only valid monitoring results should be reported and that monitoring of dechlorinating agents can be used to prove anomalous chlorine residual exceedances.

As stated in the strategy, the Regional Water Board reserves the right to use all other valid results from continuous monitoring for discretionary enforcement purposes. It is thus appropriate for the tentative order to require reporting between-the-hour valid chlorine levels that exceed the effluent limit so that Regional Water Board staff can evaluate the circumstances and determine if discretionary enforcement is warranted. The tentative order does continue to limit Sunnyvale's exposure to mandatory minimum penalties consistent with the 2004 strategy. Table 4, footnote 2 is revised as follows:

- [2] Effluent residual chlorine concentrations shall be monitored continuously or, at a minimum, every hour. The Discharger shall describe all excursions of the chlorine limit in the transmittal letter of self-monitoring reports as required by Attachment G section V.C.1.a. ~~report for each day the maximum residual chlorine concentration observed following dechlorination using all values measured during that day. However, if~~ monitoring continuously, the Discharger shall report through data upload to CIWQS, from discrete readings of the continuous monitoring every hour on the hour, the maximum for each day and any other discrete hourly reading that exceed the effluent limit, and, for the purpose of mandatory minimum penalties required by Water Code section 13385(i), compliance shall be based only on these discrete readings from the continuous monitoring every hour on the hour. The Discharger shall retain continuous monitoring readings for at least three years. The Regional Water Board reserves the right to use all continuous monitoring data for discretionary enforcement.

The Discharger may elect to use a continuous on-line monitoring system for measuring or determining that residual dechlorinating agent is present. This monitoring system may be used to prove that anomalous residual chlorine exceedances measured by on-line chlorine analyzers are false positives and are not valid total residual chlorine detections because it is chemically improbable to have chlorine present in the presence of sodium bisulfite. If Regional Water Board staff finds convincing evidence that chlorine residual exceedances are false positives, the exceedances are not violations of this Order's total chlorine residual limit.

Also, we revised the definition for sample type "Continuous/H" in Monitoring and Reporting Program Table E-3, but not exactly as Sunnyvale proposes. Continuous chlorine monitoring facilitates evaluation of compliance with the instantaneous chlorine residual effluent limitation and is best for process control. The revised footnote allows hourly monitoring only when continuous monitoring is infeasible (e.g., during maintenance). Specifically, we revised the Monitoring and Reporting Program Table E-3 footnotes (Sample Types) as follows:

Continuous/H = measured continuously (or, if infeasible, at least hourly), and recorded and reported daily hourly

Bay Area Clean Water Agencies (BACWA)

BACWA Comment 1

The Bay Area Clean Water Agencies asserts that receiving water monitoring should be the purview of the RMP. BACWA objects to requiring receiving water monitoring in addition to RMP participation, claiming that the previous order required only RMP participation. BACWA prefers that the Regional Water Board work with the RMP to complete all receiving water monitoring.

Response to BACWA Comment 1

Receiving water monitoring requirements are within the regulatory purview of the Regional Water Board, not the RMP. The Board may require receiving water monitoring outside the RMP where

necessary and has required it in many NPDES permits, particularly those for shallow water discharges where RMP data may not be representative of the monitored activity. For example, the previous order (Order No. R2-2009-0061, provision VI.C.2.e) required receiving water monitoring in the form of a special study of ammonia in Moffett Channel and Guadalupe Slough. The revised tentative order requires far less monitoring and provides Sunnyvale with some flexibility to coordinate the monitoring with the RMP or other parties. See our response to Sunnyvale Comment 1.

BACWA Comment 2

BACWA claims that reporting based on all continuous chlorine monitoring data is excessive. BACWA objects to reporting the highest daily chlorine concentration based on all data. Instead, it prefers reporting based only on 24 on-the-hour measurements. BACWA says the new approach contradicts a strategy developed with Regional Water Board staff. It asserts that the new language poses risks that momentary exceedances may appear to be violations for which the Regional Water Board is not pursuing enforcement. It also asserts that the new language requires reporting the maxima from two different data sets.

Response to BACWA Comment 2

See our response to Sunnyvale Comment 2.

Regional Water Board Staff-Initiated Changes

In addition to making minor editorial and formatting changes, we revised Receiving Water Limitation V.B.1 as follows:

The median dissolved oxygen concentration for any three consecutive months shall not be less than 80% of the dissolved oxygen content at saturation. When natural factors cause concentrations less than that specified above, the discharge shall not cause further reduction in ambient dissolved oxygen concentrations.

We revised Fact Sheet section II.A.2 as follows:

Collection System. The City of Sunnyvale's collection system is a 100 percent separate sanitary sewer. It consists of approximately 283 miles of gravity sewer pipes ranging from 6 inches to 48 inches in diameter, 140 miles of lower laterals, 2 miles of force mains, ~~with four~~ 4 lift stations, and ~~one~~ 1 pump station.

We revised Fact Sheet section II.D to include collection system compliance information as follows:

⋮

On April 25, 2011, the Discharger accepted mandatory minimum penalties for the May 2, 2010, and March 1, 2011, violations without Regional Water Board hearing. Administrative Civil Liability Order No. R2-2013-1032 settled the March 5, 2013, violation also for a mandatory minimum penalty.

To the extent that some sanitary sewer overflows (SSOs) reached waters of the U.S., the Discharger would have violated Prohibition III.D. The table below shows the

Discharger's SSO rates (total SSOs per 100 miles of collection system) along with the medians for the county and region for large systems (those greater than 100 miles):

Table F-3a. SSO Rates (total SSOs/100 miles of sewer)
(Values based on CIWQS data analysis completed in June 2014)

	<u>System</u>	<u>2011</u>	<u>2012</u>	<u>2013</u>
<u>City of Sunnyvale</u>	<u>425 miles</u>	<u>3.5</u>	<u>2.1</u>	<u>3.3</u>
<u>Santa Clara County median (of eight systems)</u>	--	<u>3.4</u>	<u>2.5</u>	<u>3.3</u>
<u>Regional median</u>	--	<u>4.0</u>	<u>4.6</u>	<u>4.5</u>

We corrected computation errors that do not affect the outcome of the reasonable potential analysis. Specifically, we revised Fact Sheet section VI.C.3.e.ii(d) as follows:

Two Approaches. According to the Technical Support Document, the reasonable potential analysis can be performed based on the RWC projected using effluent data (the steps summarized above) or actual measured RWCs. Both values may be compared directly with the Basin Plan un-ionized objectives.

(1) Reasonable Potential Analysis Based on Effluent Data. The effluent data do not indicate reasonable potential. Effluent monitoring data for total ammonia from October 6, 2009, through January 26, 2014, were used. Un-ionized ammonia concentrations were calculated using the pH and temperature data collected for the same samples. There were 204 data points (n=204). The MEC was 0.115 ~~0.029~~ mg/L expressed as un-ionized ammonia (as nitrogen). The confidence interval was set at 95%. The percentile represented by the MEC (P_n) was calculated to be 0.985, indicating that the MEC represented the 98.5th percentile of all observed ammonia effluent data. With the upper bound set at the 99th percentile, the R value was determined to be 1.22 ~~1.05~~ (C_{P_n} was 7.84 ~~2.13~~ and $C_{\text{upper bound}}$ was 9.58 ~~2.25~~), and the projected RWC was 0.14 ~~0.03~~ mg/L, which is less than the Basin Plan un-ionized ammonia acute objective of 0.4 mg/L.

The annual medians of the effluent data were used for comparison with the annual median chronic objective. The highest running annual median from the effluent data was calculated and compared with the annual median objective. No projection is needed to establish the central tendency of the data. The maximum annual median, 0.014 ~~0.006~~ mg/L, is less than the annual median objective of 0.025 mg/L.

(2) Reasonable Potential Analysis Based on Receiving Water. There is no reasonable potential for ammonia based on Moffett Channel and Guadalupe Slough receiving water data. The Discharger submitted a report titled *Receiving Water Ammonia Characterization Study – Final Report* on April 15, 2012. The report demonstrates that receiving waters in the vicinity of the outfall to Moffett Channel and Guadalupe Slough meet the Basin Plan water quality objectives for un-ionized ammonia. The highest un-ionized ammonia concentration observed near Discharge Point No. 001 during the 24-month study was 0.056 mg/L (as nitrogen) at station C-4-0, which was less than the maximum water quality objective of 0.4 mg/L. The highest annual median observed near Discharge Point No. 001 was 0.015 ~~0.009~~ mg/L at station C-3-0, which was less than the annual median water quality objective of 0.025 mg/L.