

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

RESOLUTION No. R2-2020-0031

Amending the Water Quality Control Plan for the San Francisco Bay Basin to Establish Chlorine Water Quality Objectives, to Replace the Total Residual Chlorine Technology-Based Effluent Limitation with Water Quality-Based Effluent Limitations, and to Make Minor Editorial Revisions

WHEREAS, the California Regional Water Quality Control Board, San Francisco Bay Region (Water Board), finds that:

1. The Water Quality Control Plan for the San Francisco Bay Basin (Basin Plan) is the Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives for waters of the State, including surface waters and groundwater. It also includes programs of implementation to achieve water quality objectives. The Basin Plan was duly adopted by the Water Board and approved by the State Water Resources Control Board (State Water Board), the State Office of Administrative Law (OAL), and the United States Environmental Protection Agency (U.S. EPA), where required.
2. The Basin Plan may be amended in accordance with Water Code section 13240. This Basin Plan amendment complies with this section.
3. The Basin Plan contains a technology-based residual chlorine effluent limitation, 0.0 milligrams per liter, as an instantaneous maximum, to be imposed on wastewater treatment plant discharges, which are disinfected with chlorine-based products and have the potential to discharge total residual chlorine (TRC) that is harmful to aquatic organisms at very low concentrations.
4. Wastewater treatment plants that use chlorine for disinfection of wastewater also subsequently remove residual chlorine from the wastewater using a dechlorinating chemical. This dechlorination step is performed to comply with the TRC effluent limitation. Frequently the amount of dechlorination chemical applied is in excess of the amount needed to theoretically neutralize the TRC. This practice results in extra chemical cost and minor water quality impacts, without providing environmental benefits.
5. Replacing the TRC technology-based effluent limitation with water quality-based effluent limitations would allow wastewater treatment plants to reduce the amount of dechlorination chemical used, thereby reducing costs. Minor water quality impacts would also be avoided by reducing the amount of dechlorination chemical discharged in the effluent.
6. To establish water quality-based effluent limitations for discharges, there must be applicable water quality objectives for the pollutant in the Basin Plan.



7. The Basin Plan amendment, including specifications on its physical placement in the Basin Plan, is set forth in Exhibit A. The Basin Plan amendment: (1) establishes new chlorine water quality objectives to protect aquatic life beneficial uses in marine, estuarine, and freshwaters in San Francisco Bay region; (2) replaces the TRC technology-based effluent limitation with water quality-based effluent limitations; (3) specifies how TRC water quality-based effluent limitations are implemented in National Pollutant Discharge Elimination System (NPDES) permits; and (4) makes minor, non-substantive clarifications and revisions.
8. Health and Safety Code Section 57004 does not require that any portions of the proposed Basin Plan amendment be subject to peer review because no portion of the proposed Basin Plan amendment contains new science. All of the scientific portions of the proposed Basin Plan amendment were previously peer reviewed. Thus, additional peer review is unnecessary.
9. The Water Board has considered those California Water Code section 13241 factors to be considered when establishing water quality objectives, as set forth in the Staff Report.
10. The replacement of the TRC technology-based effluent limitation with water quality-based effluent limitations is consistent with the state's antidegradation policy in Resolution No. 68-16, because increases in discharge volumes and/or concentrations of chlorine resulting from this action are expected to be consistent with the maximum benefit of the people of the state.
11. The process of basin planning has been certified in accordance with section 21080.5 of the California Environmental Quality Act (CEQA) as a regulatory program exempt from the requirement to prepare an Environmental Impact Report or Negative Declaration.
12. The Basin Plan amendment package includes a Staff Report, Environmental Checklist, an assessment of the potential environmental impacts of the Basin Plan amendment, and a discussion of alternatives and cumulative impacts. The Basin Plan amendment, Environmental Checklist, Staff Report, and supporting documentation serve as a Substitute Environmental Documentation under the Water Board's certified regulatory program.
13. The Water Board has duly considered the Staff Report and Substitute Environmental Documentation with respect to economic and environmental impacts. The Water Board finds that this Basin Plan amendment will have a positive economic impact on wastewater dischargers because the new water quality-based effluent limitations would result in reduced use of dechlorination chemicals, resulting in operational cost savings, which would help dischargers fund wastewater treatment plant improvements needed to address other issues with substantial environmental effects. The Water Board further finds that there will be no significant environment effects, either individually or cumulatively, as a result of this Basin Plan amendment.
14. On August 18, 2020, Water Board staff publicly noticed and distributed for public review and comment the proposed Basin Plan amendment, supporting draft Staff Report, and draft Substitute Environmental Documentation, in accordance with applicable State and federal laws and regulations.

15. The Water Board has carefully considered all comments and testimony received, including responses thereto, on the Basin Plan amendment, as well as all the evidence in the administrative record.
16. On November 18, 2020, the Water Board held a public hearing to consider the amendment, including response to public comments on the amendment.
17. The Basin Plan amendment must be submitted for review and approval by the State Water Board, OAL, and U.S. EPA. Once approved by the State Water Board, the amendment will be submitted to OAL and U.S. EPA. The Basin Plan amendment will become effective upon approval by OAL and U.S. EPA.

NOW, THEREFORE BE IT RESOLVED THAT:

1. The Water Board adopts the Basin Plan amendment as set forth in Exhibit A hereto.
2. The Executive Officer is directed to forward copies of the Basin Plan amendment to the State Water Board in accordance with the requirements of Water Code section 13245.
3. The Water Board requests that the State Water Board approve the Basin Plan amendment in accordance with the requirements of Water Code sections 13245 and 13246 and forward it to OAL and U.S. EPA for approval.
4. If, during the approval process, Water Board staff, the State Water Board, or OAL determines that minor, non-substantive corrections to the language of the amendment are needed for clarity or consistency, the Executive Officer may make such changes and shall inform the Water Board of any such changes.
5. Because the Basin Plan amendment will involve no potential for adverse effect, either individually or cumulatively, on wildlife, the Executive Officer is directed to sign a CEQA Filing Fee No Effect Determination Form and to submit the exemption in lieu of payment of the Department of Fish and Wildlife CEQA filing fee.

I, Michael Montgomery, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of a Resolution adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on November 18, 2020.


Digitally signed by
Michael Montgomery
Date: 2020.11.25
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Michael Montgomery
Executive Officer

Attachment:

Exhibit A – Basin Plan Amendment to Establish Chlorine Water Quality Objectives, to Replace Total Residual Chlorine Technology-Based Effluent Limitation with Water Quality-Based Effluent Limitations

Exhibit A

PROPOSED BASIN PLAN AMENDMENT

Proposed Basin Plan Amendment

Revisions indicated in single underline represent new language, and revisions indicated in ~~strikeout~~ represent deleted language.

Table 3-3: Marine^a Water Quality Objectives for Toxic Pollutants for Surface Waters (all values in µg/L)

Compound	4-day Average	1-hr Average	24-hr Average
Arsenic ^{b, c, d}	36	69	
Cadmium ^{b, c, d}	9.3	42	
Chromium VI ^{b, c, d, e}	50	1100	
Copper ^{c, d, f, l}			
Cyanide ^g			
Lead ^{b, c, d}	8.1	210	
Mercury ^h	0.025	2.1	
Nickel ^{b, c, d, l}	8.2	74	
Selenium ⁱ			
Silver ^{b, c, d}		1.9	
Tributyltin ^j			
Zinc ^{b, c, d}	81	90	
PAHs ^k			15

NOTES:

- a. Marine waters are those in which the salinity is equal to or greater than 10 parts per thousand 95% of the time, as set forth in Chapter 4 of the Basin Plan. Unless a site-specific objective has been adopted, these objectives shall apply to all marine waters except for the South Bay south of Dumbarton Bridge (where the California Toxics Rule (CTR) applies) or as specified in note h (below). For waters in which the salinity is between 1 and 10 parts per thousand, the applicable objectives are the more stringent of the freshwater (Table 3-4) or marine objectives.
- b. Source: 40 CFR Part 131.38 (California Toxics Rule or CTR), May 18, 2000.
- c. These objectives for metals are expressed in terms of the dissolved fraction of the metal in the water column.
- d. According to the CTR, these objectives are expressed as a function of the water-effect ratio (WER), which is a measure of the toxicity of a pollutant in site water divided by the same measure of the toxicity of the same pollutant in laboratory dilution water. The 1-hr. and 4-day objectives = table value X WER. The table values assume a WER equal to one.
- e. This objective may be met as total chromium.
- f. Water quality objectives for copper were promulgated by the CTR and may be updated by U.S. EPA without amending the Basin Plan. Note: at the time of writing, the values are 3.1 ug/l (4-day average) and 4.8 ug/l (1-hr. average). The most recent version of the CTR should be consulted before applying these values.

- g. Cyanide criteria were promulgated in the National Toxics Rule (NTR) (Note: at the time of writing, the values are 1.0 µg/l (4-day average) and 1.0 µg/l (1-hr. average)) and apply, except that site-specific marine water quality objectives for cyanide have been adopted for San Francisco Bay as set forth in Table 3-3C.
- h. Source: U.S. EPA Ambient Water Quality Criteria for Mercury (1984). The 4-day average value for mercury does not apply to San Francisco Bay; instead, the water quality objectives specified in Table 3-3B apply. The 1-hour average value continues to apply to San Francisco Bay. For enclosed bays and estuaries other than San Francisco Bay, which has site-specific objectives in Table 3-3B, refer to Part 2 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California—Tribal and Subsistence Fishing Beneficial Uses and Mercury Provisions (Statewide Mercury Provisions).
- i. Selenium criteria were promulgated for all San Francisco Bay/Delta waters in the National Toxics Rule (NTR). The NTR criteria specifically apply to San Francisco Bay upstream to and including Suisun Bay and Sacramento-San Joaquin Delta. Note: at the time of writing, the values are 5.0 ug/l (4-day average) and 20 ug/l (1-hr. average).
- j. Tributyltin is a compound used as an antifouling ingredient in marine paints and toxic to aquatic life in low concentrations. U.S. EPA has published draft criteria for protection of aquatic life (Federal Register: December 27, 2002, Vol. 67, No. 249, Page 79090-79091). These criteria are cited for advisory purposes. The draft criteria may be revised.
- k. The 24-hour average aquatic life protection objective for total PAHs is retained from the 1995 Basin Plan. Source: U.S. EPA 1980.
- l. Table 3-3A contains site-specific water quality objectives for copper and nickel applicable to specific San Francisco Bay segments.

Table 3-4: Freshwater^a Water Quality Objectives for Toxic Pollutants for Surface Waters (all values in µg/L)

Compound	4-day Average	1-hr Average
Arsenic ^{b, c, d}	150	340
Cadmium ^{b, d}	e	e
Chromium III ^f		
Chromium VI ^{b, c, d, g}	11	16
Copper ^{b, c, d}	9.0 ^h	13 ^h
Cyanide ⁱ		
Lead ^{b, c, d}	2.5 ^j	65 ^j
Mercury ^k	0.025	2.4
Nickel ^{b, c, d}	52 ^l	470 ^l
Selenium ^m		
Silver ^{b, c, d}		3.4 ⁿ
Tributyltin ^o		
Zinc ^{b, c, d}	120 ^p	120 ^p

Notes:

- a. Freshwaters are those in which the salinity is equal to or less than 1 part per thousand 95% of the time, as set forth in Chapter 4 of the Basin Plan. Unless a site-specific objective has been adopted, these objectives shall apply to all freshwaters except for the South Bay south of Dumbarton Bridge, where the California Toxics Rule (CTR) applies. For waters in which the salinity is between 1 and 10 parts per thousand, the applicable objectives are the more stringent of the marine (Table 3-3) and freshwater objectives.
- b. Source: 40 CFR Part 131.38 (California Toxics Rule or CTR), May 18, 2000.
- c. These objectives for metals are expressed in terms of the dissolved fraction of the metal in the water column.
- d. These objectives are expressed as a function of the water-effect ratio (WER), which is a measure of the toxicity of a pollutant in site water divided by the same measure of the toxicity of the same pollutant in laboratory dilution water. The 1-hr. and 4-day objectives = table value × WER. The table values assume a WER equal to one.
- e. The objectives for cadmium and other noted metals are expressed by formulas where H = ln (hardness) as CaCO₃ in mg/l: The four-day average objective for cadmium is $e^{(0.7852 H - 3.490)}$. This is 1.1 µg/l at a hardness of 100 mg/l as CaCO₃. The one-hour average objective for cadmium is $e^{(1.128 H - 3.828)}$. This is 3.9 µg/l at a hardness of 100 mg/l as CaCO₃.
- f. Chromium III criteria were promulgated in the National Toxics Rule (NTR). The NTR criteria specifically apply to San Francisco Bay upstream to and including Suisun Bay and Sacramento-San Joaquin Delta. Note: at the time of writing, the values are 180 ug/l (4-day average) and 550 ug/l (1-hr. average). The objectives for chromium III are based on hardness. The values in this footnote assume a hardness of 100 mg/l CaCO₃. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for chromium III is $e^{(0.8190 H + 1.561)}$. The 1-hour average for chromium III is $e^{(0.8190 H + 3.688)}$.
- g. This objective may be met as total chromium.

- h. The objectives for copper are based on hardness. The table values assume a hardness of 100 mg/l CaCO₃. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for copper is $e^{(0.8545H-1.702)}$. The 1-hour average for copper is $e^{(0.9422H-1.700)}$.
- i. Cyanide criteria were promulgated in the National Toxics Rule (NTR). The NTR criteria specifically apply to San Francisco Bay upstream to and including Suisun Bay and Sacramento-San Joaquin Delta. Note: at the time of writing, the values are 5.2 ug/l (4-day average) and 22 ug/l (1-hr. average).
- j. The objectives for lead are based on hardness. The table values assume a hardness of 100 mg/l CaCO₃. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective is $e^{(1.273H -4.705)}$. The 1-hour average for lead is $e^{(1.273H-1.460)}$.
- k. Source: U.S. EPA Quality Criteria for Water 1986 (EPA 440/5-86-001), ~~which established a mercury criterion of 0.012 ug/l. The Basin Plan set the objective at 0.025 based on considerations of the level of detection attainable at that time. The 4-day average value for mercury does not apply to Walker Creek and Soulajule Reservoir and their tributaries nor to waters of the Guadalupe River watershed; instead, the water quality objectives specified in Table 3-4A apply.~~ The 1-hour average value continues to apply to waters specified in Table 3-4A. For inland surface waters other than those covered under Table 3-4A, refer to Part 2 of the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries of California—Tribal and Subsistence Fishing Beneficial Uses and Mercury Provisions (Statewide Mercury Provisions).
- l. The objectives for nickel are based on hardness. The table values assume a hardness of 100 mg/l CaCO₃. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective is $e^{(0.8460H + 0.0584)}$. The 1-hour average objective is $e^{(0.8460H + 2.255)}$.
- m. Selenium criteria were promulgated for all San Francisco Bay/Delta waters in the National Toxics Rule (NTR). The NTR criteria specifically apply to San Francisco Bay upstream to and including Suisun Bay and Sacramento-San Joaquin Delta. Note: at the time of writing, the values are 5.0 ug/l (4-day average) and 20 ug/l (1-hr. average).
- n. The objective for silver is based on hardness. The table value assumes a hardness of 100 mg/l CaCO₃. At other hardnesses, the objective must be calculated using the following formula where H = ln (hardness): The 1-hour average objective for silver is $e^{(1.72H -6.52)}$. U.S. EPA has not developed a 4-day criterion.
- o. Tributyltin is a compound used as an antifouling ingredient in marine paints and toxic to aquatic life in low concentrations. U.S. EPA has published draft criteria for protection of aquatic life (Federal Register: December 27, 2002, Vol. 67, No. 249, Page 79090-79091). These criteria are cited for advisory purposes. The draft criteria may be revised.
- p. The objectives for zinc are based on hardness. The table values assume a hardness of 100 mg/l CaCO₃. At other hardnesses, the objectives must be calculated using the following formulas where H = ln (hardness): The 4-day average objective for zinc is $e^{(0.8473 H+0.884)}$. The 1-hour average for zinc is $e^{(0.8473 H+ 0.884)}$.

3.3.23 CHLORINE

The discharge of wastes shall not cause receiving waters to contain concentrations of chlorine-produced oxidants or total residual chlorine in excess of the following objectives for the protection of marine, estuarine, and freshwater aquatic life beneficial uses:

Table 3-8: Chlorine Water Quality Objectives for the Protection of Aquatic Life Beneficial Uses in Marine, Estuarine, and Freshwaters (all values in ug/l)

<u>Receiving Water Type^a</u>	<u>4-day Average</u>	<u>1-hour Average</u>
<u>Marine or Estuarine (Chlorine-Produced Oxidants^b)</u>	<u>7.5</u>	<u>13</u>
<u>Freshwater (Total Residual Chlorine^c)</u>	<u>11</u>	<u>19</u>

Notes:

- a. Marine waters are those in which the salinity is equal to or greater than 10 parts per thousand 95 percent of the time; freshwaters are those in which the salinity is equal to or less than 1 part per thousand 95 percent of the time; estuarine waters are those with salinities in between the above two categories, as set forth in Chapter 4 of the Basin Plan.
- b. Chlorine-produced oxidants are the sum of free and combined chlorine and bromine, as measured by the methods for "total residual chlorine."
- c. Total residual chlorine is the sum of free and combined chlorine.

Source: 1984 national ambient water quality criteria for chlorine (EPA 440/5-84-030).

Table 4-2 Effluent Limitations for Conventional Pollutants (all units in mg/L, except as otherwise noted)

Parameters:	3-Day Average	7-Day Average	Daily Maximum	1-Hour Average	Instantaneous Limit
Biochemical Oxygen Demand (BOD ₅) ^{a,b}	30	45			
Suspended Solids (SS) ^a	30	45			
85% removal of BOD and SS ^{a,c}					
pH ^d (in pH units)					
- Shallow Water Discharge					6.5-8.5
- Deep Water Discharge					6.0-9.0
<u>Total Residual Chlorine</u> ^{d,f} (free chlorine plus chloramines)					0.0
- <u>Marine/Estuarine Discharge</u>				0.013	
- <u>Freshwater Discharge</u>				0.019	
Settleable Matter ^e (in ml/l-hr)	0.1		0.2		
Oil & Grease ^{dq}	10		20		

Notes:

- a. These effluent limitations apply to all sewage treatment facilities that discharge to inland surface waters and enclosed bays and estuaries. The Water Board may also apply some of these limitations selectively to certain other non-sewage discharges, but they will not be used to preempt Effluent Guideline Limitations established pursuant to Sections 301, 302, 304, or 306 of the federal Water Pollution Control Act, as amended. (Such Effluent Guideline Limitations are included in NPDES permits for particular industries.)
- b. The federal regulation allows the parameter BOD to be substituted with Carbonaceous BOD at levels that shall not exceed 25 mg/l as a 30-day average, nor 40 mg/l as a 7-day average.
- c. The arithmetic mean of the biochemical oxygen demand (5-day 20°C) and suspended solids values, by weight, for effluent samples collected in any month shall not exceed 15 percent of the arithmetic mean of the respective values, by weight, for simultaneous influent samples.
- d. These effluent limitations apply to all treatment facilities.
- e. Discharges from sedimentation and similar cases should generally not contain more than 1.0 ml/l-hr of settleable matter. Design and maintenance of erosion and sediment control structures shall comply with accepted engineering practices as identified in the Association of Bay Area Government's (ABAG's) *Manual of Standards for Erosion and Sediment Control Measures*.
- f. These effluent limitations apply to all treatment facilities with potential to discharge chlorine.

These effluent limitations may be adjusted to account for a mixing zone in a manner consistent with procedures in the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California. Total residual chlorine should be monitored with a frequency of not less than one sample every five minutes. Less frequent sampling may be appropriate for smaller, seasonal, or intermittent discharge facilities, or for facilities that rely on natural dechlorination in ponds or wetlands rather than using chemical addition for dechlorination. To determine compliance with the 1-hour average effluent limitation, all readings recorded within each hour shall be considered. All readings below the minimum level shall be treated as zero for compliance determination. The discharger shall calculate

the arithmetic mean for each hour with all the readings within the hour and compare it with the 1-hour average effluent limitation.

The Water Board will establish water quality-based effluent limitations based on the 4-day average chlorine water quality objective if it is deemed necessary to ensure receiving waters meet the 4-day average water quality objective.

In most cases, the minimum level (which is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed) shall be no greater than 0.05 mg/L and shall be reported along with the arithmetic mean of the total residual chlorine results. Higher minimum levels may be used where justified, for example, if a discharger must rely on field instruments.

- g. These effluent limitations apply to all treatment facilities except those that provide secondary or advanced secondary treatment.