Discharge Point	Receiving Water Name	Beneficial Use(s)
001	Central San Francisco Bay	Industrial Service Supply (IND) Industrial Process Supply (PRO) Navigation (NAV) Water Contact Recreation (REC1) Non-Contact Water Recreation (REC2) Ocean, Commercial and Sport Fishing (COMM) Wildlife Habitat (WILD) Preservation of Rare and Endangered Species (RARE) Fish Migration (MIGR) Fish Spawning (SPWN) Shellfish Harvesting (SHELL) Estuarine Habitat (EST)

The Basin Plan implements State Water Resources Control Board (State Water Board) Resolution No. 88-63, which establishes State policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply (MUN). Because of the marine influence on receiving waters of the San Francisco Bay, total dissolved solids levels in the Bay commonly (and often significantly) exceed 3,000 mg/L and thereby meet an exception to State Water Board Resolution No. 88-63. Therefore, the designation MUN is not applicable to the Central San Francisco Bay.

b. **Basin Plan.** The Basin Plan specifies numeric WQOs for 10 priority toxic pollutants, as well as narrative WQOs for toxicity and bioaccumulation in order to protect beneficial uses. The pollutants for which the Basin Plan specifies numeric objectives are arsenic, cadmium, chromium (VI), copper in freshwater, lead, mercury, nickel, silver, zinc, and cyanide. The narrative toxicity objective states in part "[a]ll waters shall be maintained free of toxic substances in concentrations that are lethal to or that produce other detrimental responses in aquatic organisms." The bioaccumulation objective states in part "[c]ontrollable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life. Effects on aquatic organisms, wildlife, and human health will be considered." Effluent limitations and provisions contained in this Order are designed, based on available information, to implement these objectives.

c. **CTR.** The CTR specifies numeric aquatic life criteria for 23 priority toxic pollutants and numeric human health criteria for 57 priority toxic pollutants. These criteria apply to all inland surface waters and enclosed bays and estuaries of the San Francisco Bay Region, although Tables 3-3 and 3-4 of the Basin Plan include numeric objectives for certain of these priority toxic pollutants, which supersede criteria of the CTR (except in the South Bay south of the Dumbarton Bridge).

d. **NTR.** The NTR establishes numeric aquatic life criteria for selenium, numeric aquatic life and human health criteria for cyanide, and numeric human health criteria for 34 toxic organic pollutants for waters of San Francisco Bay upstream to, and

including Suisun Bay and the Delta. These criteria of the NTR are applicable to the Central San Francisco Bay, the receiving water for this Discharger.

e. **Technical Support Document for Water Quality-Based Toxics Controls.** Where numeric objectives have not been established or updated in the Basin Plan, NPDES regulations at 40 CFR Part 122.44 (d) require that WQBELs be established based on USEPA criteria, supplemented where necessary by other relevant information, to attain and maintain narrative WQOs to fully protect designated beneficial uses.

   To determine the need for and establish WQBELs, when necessary, the Regional Water Board staff has followed the requirements of applicable NPDES regulations, including 40 CFR Parts 122 and 131, as well as guidance and requirements established by the Basin Plan; USEPA's *Technical Support Document for Water Quality-Based Toxics Control* (the TSD, EPA/505/2-90-001, 1991); and the State Water Resources Control Board's *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (the SIP, 2005).

f. **Basin Plan Receiving Water Salinity Policy.** The Basin Plan (like the CTR and the NTR) states that the salinity characteristics (i.e., freshwater vs. saltwater) of the receiving water shall be considered in determining the applicable WQC. Freshwater criteria shall apply to discharges to waters with salinities equal to or less than one ppt at least 95 percent of the time. Saltwater criteria shall apply to discharges to waters with salinities equal to or greater than 10 ppt at least 95 percent of the time in a normal water year. For discharges to water with salinities between these two categories, or tidally influenced freshwaters that support estuarine beneficial uses, the criteria shall be the lower of the salt or freshwater criteria (the latter calculated based on ambient hardness) for each substance.

   The receiving water for this discharger, Central San Francisco Bay, is a salt water environment based on salinity data generated through the San Francisco Estuary Institute's Regional Monitoring Program at the Richardson Bay (BC30), Point Isabel (BC41), and Yerba Buena (BC10) sampling stations between 1993 and 2001. In that period, the average salinity at the three sampling stations was 28.7 ppt, and the minimum observed salinity levels at the Richardson Bay, Point Isabel, and Yerba Buena sampling stations were 11.8, 11.6, and 9.9 ppt, respectively. As salinity was greater than 10 ppt in at least 99 percent of receiving water samples, the saltwater criteria from the Basin Plan, NTR, and CTR are applicable to this discharge.

g. **Site-Specific Metals Translators.** Because NPDES regulations at 40CFR 122.45(c) require that effluent limitations for metals be expressed as total recoverable metal, and applicable WQC for metals are typically expressed as dissolved metal, factors or translators must be used to convert metals concentrations from dissolved to total recoverable and vice versa. In the CTR, USEPA establishes default translators that are used in NPDES permitting activities; however, site-specific conditions such as water temperature, pH, suspended solids, and organic carbon greatly impact the form of metal (dissolved, filterable, or otherwise) that is present in the water and therefore available to cause toxicity. In general, the dissolved form of the metals is more available and more toxic to aquatic

life than filterable forms. Site-specific translators can be developed to account for site-specific conditions, thereby preventing exceedingly stringent or under-protective WQOs.

For deep water discharges to Central San Francisco Bay, Regional Water Board staff used the following translators for copper and nickel, based on recommendations in the Clean Estuary Partnership's *North of Dumbarton Bridge Copper and Nickel Development and Selection of Final Translators* (2005). In determining the need for and calculating WQBELs for all other metals, Regional Board staff used default translators established by USEPA in the CTR at 40 CFR 131.38(b)(2), Table 2.

Table F-8. Translators for Copper and Nickel for Deepwater Discharges North of Dumbarton Bridge (Central San Francisco Bay)

	AMEL Translator	MDEL Translator
Copper	0.74	0.88
Nickel	0.65	0.85

3. Determining the Need for WQBELs

NPDES regulations at 40 CFR 122.44 (d)(1)(i) require permits to include WQBELs for all pollutants (non-priority and priority) "which the Director determines are or may be discharged at a level which will cause, have the reasonable potential to cause, or contribute to an excursion above any narrative or numeric criteria within a State water quality standard." Thus, assessing whether a pollutant has "Reasonable Potential" is the fundamental step in determining whether or not a WQBEL is required. For non-priority pollutants, Regional Water Board staff used available monitoring data, the receiving water's designated beneficial uses, and/or previous permit pollutant limitations to determine Reasonable Potential. For priority pollutants, Regional Water Board staff used the methods prescribed in Section 1.3 of the SIP to determine if the discharge from the Treatment Plant demonstrates Reasonable Potential as described below in sections 3.a – 3.e.

a. Reasonable Potential Analysis

Using the methods prescribed in Section 1.3 of the SIP, Regional Water Board staff analyzed the effluent data to determine if the discharge from the Treatment Plant demonstrates Reasonable Potential. The Reasonable Potential Analysis (RPA) compares the effluent data with numeric and narrative WQOs in the Basin Plan and numeric WQC established by the USEPA in the NTR and CTR. The Basin Plan objectives and CTR criteria are shown in Appendix A of this Fact Sheet.

b. Reasonable Potential Methodology

Using the methods and procedures prescribed in Section 1.3 of the SIP, Regional Water Board staff analyzed the effluent and background data and the nature of facility operations to determine if the discharge has Reasonable Potential to cause or contribute to exceedances of applicable Site-Specific Objectives or WQC. Appendix A of this Fact Sheet shows the stepwise process described in Section 1.3 of the SIP.

The RPA projects a maximum effluent concentration (MEC) for each pollutant based on existing data, while accounting for a limited data set and effluent variability. There are three triggers in determining Reasonable Potential.

(1) The first trigger is activated if the MEC is greater than or equal to the lowest applicable WQC (MEC ≥ WQC), which has been adjusted, if appropriate, for pH, hardness, and translator data. If the MEC is greater than or equal to the adjusted WQC, then that pollutant has Reasonable Potential, and a WQBEL is required.

(2) The second trigger is activated if the observed maximum ambient background concentration (B) is greater than the adjusted WQC (B > WQC), and the pollutant is detected in any of the effluent samples (MEC > ND).

(3) The third trigger is activated if a review of other information determines that a WQBEL is required to protect beneficial uses, even though both MEC and B are less than the WQC. A limitation may be required under certain circumstances to protect beneficial uses.

c. Effluent Data

The Regional Water Board's August 6, 2001 letter titled *Requirement for Monitoring of Pollutants in Effluent and Receiving Water to Implement New Statewide Regulations and Policy* (hereinafter referred to as the August 6, 2001 Letter – available online; see Standard Language and Other References Available Online, below) to all permittees, formally required the Discharger (pursuant to California Water Code Section 13267) to initiate or continue monitoring for the priority pollutants using analytical methods that provide the best detection limits reasonably feasible. Regional Water Board staff analyzed these effluent data and the nature of the Treatment Plant to determine if the discharge has Reasonable Potential. The RPA was based on the effluent monitoring data collected by the Discharger from April 2004 through March 2007 for most inorganic pollutants, and from March 2002 through September 2003 for most organic pollutants.

d. Ambient Background Data

Ambient background values are used in the RPA and in the calculation of effluent limitations. For the RPA, ambient background concentrations are the observed maximum detected water column concentrations. The SIP states that for

calculating WQBELs, ambient background concentrations are either the observed maximum ambient water column concentrations or, for criteria intended to protect human health from carcinogenic effects, the arithmetic mean of observed ambient water concentrations. The RMP station at Yerba Buena Island, located in the Central Bay, has been monitored for most of the inorganic (CTR constituent numbers 1–15) and some of the organic (CTR constituent numbers 16–126) toxic pollutants, and these data from the RMP were used as background data in performing the RPA for this Discharger.

Not all the constituents listed in the CTR have been analyzed by the RMP. These data gaps are addressed by the August 6, 2001, Letter. The August 6, 2001, Letter formally requires Dischargers (pursuant to Section 13267 of the California Water Code) to conduct ambient background monitoring and effluent monitoring for those constituents not currently monitored by the RMP and to provide this technical information to the Regional Water Board.

On May 15, 2003, a group of several San Francisco Bay Region dischargers (known as the Bay Area Clean Water Agencies, or BACWA) submitted a collaborative receiving water study, entitled the *San Francisco Bay Ambient Water Monitoring Interim Report* (2003). This study includes monitoring results from sampling events in 2002 and 2003 for most of the remaining priority pollutants not monitored by the RMP. The RPA was conducted and the WQBELs were calculated using RMP data from 1993 through 2003 for inorganics and organics at the Yerba Buena Island RMP station, and additional data from the BACWA *Ambient Water Monitoring: Final CTR Sampling Update* (2004) for the Yerba Buena Island RMP station.

e. Reasonable Potential Determination

The MECs, most stringent applicable WQC, and background concentrations used in the RPA are presented in the following table, along with the RPA results (yes or no) for each pollutant analyzed. Reasonable Potential was not determined for all pollutants, as there are not applicable WQC for all pollutants, and monitoring data were not available for others. The complete RPA is shown in Appendix A of this Fact Sheet. Based on a review of the effluent data collected during the previous permit term, the pollutants that exhibit Reasonable Potential are copper, mercury, selenium, cyanide, bis(2-ethylhexyl)phthalate, ammonia, and dioxin-TEQ. For mercury, however, subsequent to the adoption of the mercury watershed permit, mercury levels do not apply to this permit.

Table F-9. Summary of RPA Results

CTR #	Priority Pollutants	MEC or Minimum DL [a][b] (µg/L)	Governing WQO/WQC (µg/L)	Maximum Background or Minimum DL [a][b] (µg/L)	RPA Results [c]
1	Antimony	**0.7**	4300	1.8	No
2	Arsenic	**6.4**	36	2.81	No
3	Beryllium	<0.06	No Criteria	0.215	Ud
4	Cadmium	**0.8**	9.4	0.16	No
5a	Chromium (III)	**1**	No Criteria	Not Available	Ud
5b	Chromium (VI)	<0.9	50	4.4	No
6	**Copper**	**6.6**	4.2	2.55	**Yes**
7	Lead	**0.32**	8.5	0.80	No
8	**Mercury (303d listed)**	**0.033**	0.025	0.0086	**Yes**
9	Nickel	**8.9**	13	3.7	No
10	**Selenium (303d)**	**6**	5.0	0.39	**Yes**
11	Silver	**0.2**	2.2	0.052	No
12	Thallium	**0.1**	6.3	0.21	No
13	Zinc	**70**	86	5.1	No
14	**Cyanide**	**13**	1.0	< 0.4	**Yes**
15	Asbestos	Not Available	No Criteria	Not Available	Ud
16	2,3,7,8-TCDD (303d listed)	< 6.4E-07	1.4E-08	8.00E-3	No
	Dioxin TEQ (303d listed)	**3.2E-09**	1.4E-08	7.10E-08	**Yes**
17	Acrolein	< 1	780	< 0.5	No
18	Acrylonitrile	< 1	0.66	0.03	No
19	Benzene	< 0.27	71	< 0.05	No
20	Bromoform	**18**	360	< 0.5	No
21	Carbon Tetrachloride	< 0.42	4.4	0.06	No
22	Chlorobenzene	< 0.19	21000	< 0.5	No
23	Chlorodibromomethane	**8.5**	34	< 0.05	No
24	Chloroethane	< 0.34	No Criteria	< 0.5	Ud
25	2-Chloroethylvinyl ether	< 0.31	No Criteria	< 0.5	Ud
26	Chloroform	**2.7**	No Criteria	< 0.5	Ud
27	Dichlorobromomethane	**3.9**	46	< 0.05	No
28	1,1-Dichloroethane	< 0.28	No Criteria	< 0.05	Ud
29	1,2-Dichloroethane	< 0.18	99	0.04	No
30	1,1-Dichloroethylene	< 0.37	3.2	< 0.5	No
31	1,2-Dichloropropane	< 0.2	39	< 0.05	No
32	1,3-Dichloropropylene	< 0.2	1700	Not Available	No
33	Ethylbenzene	< 0.3	29000	< 0.5	No
34	Methyl Bromide	< 0.42	4000	< 0.5	No
35	Methyl Chloride	< 0.36	No Criteria	< 0.5	Ud
36	Methylene Chloride	**4**	1600	22	No
37	1,1,2,2-Tetrachloroethane	< 0.3	11	< 0.05	No
38	Tetrachloroethylene	<0.32	8.85	< 0.5	No
39	Toluene	**1.6**	200000	< 0.3	No
40	1,2-Trans-Dichloroethylene	< 0.3	140000	< 0.5	No
41	1,1,1-Trichloroethane	< 0.35	No Criteria	< 0.5	Ud
42	1,1,2-Trichloroethane	< 0.27	42	< 0.05	No
43	Trichloroethylene	< 0.29	81	< 0.5	No
44	Vinyl Chloride	< 0.34	525	< 0.5	No
45	2-Chlorophenol	< 0.4	400	< 1.2	No
46	2,4-Dichlorophenol	< 0.3	790	< 1.3	No
47	2,4-Dimethylphenol	< 0.3	2300	< 1.3	No
48	2-Methyl- 4,6-Dinitrophenol	< 0.4	765	< 1.2	No
49	2,4-Dinitrophenol	< 0.3	14000	< 0.7	No

CTR #	Priority Pollutants	MEC or Minimum DL [a][b] (µg/L)	Governing WQO/WQC (µg/L)	Maximum Background or Minimum DL [a][b] (µg/L)	RPA Results [c]
50	2-Nitrophenol	< 0.3	No Criteria	< 1.3	Ud
51	4-Nitrophenol	< 0.2	No Criteria	< 1.6	Ud
52	3-Methyl 4-Chlorophenol	< 0.3	No Criteria	< 1.1	Ud
53	Pentachlorophenol	< 0.4	7.9	< 1.0	No
54	Phenol	< 0.2	4600000	< 1.3	No
55	2,4,6-Trichlorophenol	< 0.2	6.5	< 1.3	No
56	Acenaphthene	< 0.17	2700	0.0019	No
57	Acenaphthylene	< 0.03	No Criteria	0.00053	Ud
58	Anthracene	< 0.16	110000	0.00050	No
59	Benzidine	< 0.3	0.00054	< 0.0015	No
60	Benzo(a)Anthracene	< 0.12	0.049	0.0053	No
61	Benzo(a)Pyrene	< 0.09	0.049	0.0015	No
62	Benzo(b)Fluoranthene	< 0.11	0.049	0.0046	No
63	Benzo(ghi)Perylene	< 0.06	No Criteria	0.0027	Ud
64	Benzo(k)Fluoranthene	< 0.16	0.049	0.0015	No
65	Bis(2-Chloroethoxy)Methane	< 0.3	No Criteria	< 0.3	Ud
66	Bis(2-Chloroethyl)Ether	< 0.3	1.4	< 0.3	No
67	Bis(2-Chloroisopropyl)Ether	< 0.6	170000	Not Available	No
68	**Bis(2-Ethylhexyl)Phthalate**	**7**	5.9	0.091	**Yes**
69	4-Bromophenyl Phenyl Ether	< 0.4	No Criteria	< 0.23	Ud
70	Butylbenzyl Phthalate	< 0.4	5200	0.0056	No
71	2-Chloronaphthalene	< 0.3	4300	< 0.3	No
72	4-Chlorophenyl Phenyl Ether	< 0.4	No Criteria	< 0.3	Ud
73	Chrysene	< 0.14	0.049	0.0024	No
74	Dibenzo(a,h)Anthracene	< 0.04	0.049	0.00064	No
75	1,2-Dichlorobenzene	< 0.12	17000	< 0.8	No
76	1,3-Dichlorobenzene	< 0.16	2600	< 0.8	No
77	1,4-Dichlorobenzene	**0.4**	2600	< 0.8	No
78	3,3 Dichlorobenzidine	< 0.3	0.077	< 0.001	No
79	Diethyl Phthalate	< 0.4	120000	< 0.24	No
80	Dimethyl Phthalate	< 0.4	2900000	< 0.24	No
81	Di-n-Butyl Phthalate	< 0.4	12000	0.016	No
82	2,4-Dinitrotoluene	< 0.3	9.1	< 0.27	No
83	2,6-Dinitrotoluene	< 0.3	No Criteria	< 0.29	Ud
84	Di-n-Octyl Phthalate	< 0.4	No Criteria	< 0.38	Ud
85	1,2-Diphenylhydrazine	< 0.3	0.54	0.0037	No
86	Fluoranthene	< 0.03	370	0.011	No
87	Fluorene	< 0.02	14000	0.0036	No
88	Hexachlorobenzene	< 0.4	0.00077	0.000022	No
89	Hexachlorobutadiene	< 0.2	50	< 0.3	No
90	Hexachlorocyclopentadiene	< 0.1	17000	< 0.31	No
91	Hexachloroethane	< 0.2	8.9	< 0.2	No
92	Indeno(1,2,3-cd)Pyrene	< 0.04	0.049	0.004	No
93	Isophorone	< 0.3	600	< 0.3	No
94	Naphthalene	< 0.05	No Criteria	0.0026	Ud
95	Nitrobenzene	< 0.3	1900	< 0.25	No
96	N-Nitrosodimethylamine	< 0.4	8.1	< 0.3	No
97	N-Nitrosodi-n-Propylamine	< 0.3	1.4	< 0.001	No
98	N-Nitrosodiphenylamine	< 0.4	16	< 0.001	No
99	Phenanthrene	< 0.03	No Criteria	0.0061	Ud
100	Pyrene	< 0.03	11000	0.019	No
101	1,2,4-Trichlorobenzene	< 0.3	No Criteria	< 0.3	Ud

CTR #	Priority Pollutants	MEC or Minimum DL [a][b] (µg/L)	Governing WQO/WQC (µg/L)	Maximum Background or Minimum DL [a][b] (µg/L)	RPA Results [c]
102	Aldrin	< 0.003	0.00014	1.4E-7	No
103	Alpha-BHC	< 0.002	0.013	0.000496	No
104	beta-BHC	< 0.001	0.046	0.000413	No
105	gamma-BHC	< 0.001	0.063	0.0007034	No
106	delta-BHC	< 0.001	No Criteria	0.000053	Ud
107	Chlordane (303d listed)	< 0.005	0.00059	0.00018	No
108	4,4'-DDT (303d listed)	< 0.001	0.00059	0.00017	No
109	4,4'-DDE (linked to DDT)	< 0.001	0.00059	0.000693	No
110	4,4'-DDD	< 0.001	0.00084	0.000313	No
111	Dieldrin (303d listed)	< 0.002	0.00014	0.000264	No
112	Alpha-Endosulfan	< 0.002	0.0087	0.000031	No
113	beta-Endolsulfan	< 0.001	0.0087	0.000069	No
114	Endosulfan Sulfate	< 0.001	240	0.0000819	No
115	Endrin	< 0.002	0.0023	0.000036	No
116	Endrin Aldehyde	< 0.002	0.81	Not Available	No
117	Heptachlor	< 0.003	0.00021	0.000019	No
118	Heptachlor Epoxide	< 0.002	0.00011	0.000094	No
119-125	PCBs sum (303d listed)	< 0.03	0.00017	0.0015	No
126	Toxaphene	< 0.2	0.0002	Not Available	No
	Tributylin	< 0.0013	0.0074	< 0.002	No
	Total PAHs	<0.02	15	0.051	No
	Ammonia [c]	**41000**	1190	430	**Yes**

The Maximum Effluent Concentration (MEC) and maximum background concentration are the actual detected concentrations unless preceded by a "<" sign, in which case the value shown is the minimum detection level (DL).

[a] The MEC or maximum background concentration is "Not Available" when there are no monitoring data for the constituent.

[b] RPA Results = Yes, if MEC > WQC, B > WQC and MEC is detected, or Trigger 3;
= No, if MEC and B are < WQC or all effluent data are undetected;
= Undetermined (Ud), if no criteria have been promulgated or there are insufficient data.

[c] See section IV.C.4.d.7 of this Order for an explanation of the WQC for ammonia.

(1) Constituents with limited data. The Discharger has performed sampling and analysis for the constituents listed in the CTR. This data set was used to perform the RPA. In some cases, Reasonable Potential cannot be determined because effluent data are limited, or ambient background concentrations are not available. The Dischargers will continue to monitor for these constituents in the effluent using analytical methods that provide the best feasible detection limits. When additional data become available, further RPA will be conducted to determine whether to add numeric effluent limitations to this Order or to continue monitoring.

(2) Pollutants with no Reasonable Potential. WQBELs are not included in this Order for constituents that do not demonstrate Reasonable Potential; however, monitoring for those pollutants is still required. If concentrations of these constituents are found to have increased significantly, the dischargers are required to investigate the source(s) of the increase(s). Remedial measures are required if the increases pose a threat to water quality in the receiving water.

The previous Order R2-2002-0097 included final WQBELs for lead, nickel, silver, and zinc; however, because the RPA showed that discharges from the Treatment Plant no longer demonstrate a reasonable potential to cause or contribute to exceedances of applicable water quality criteria for these pollutants, limitations from the previous permit are not retained. This is consistent with State Water Resources Control Board Order WQ 2001-16.

4. WQBEL Calculations.

a. Pollutants with Reasonable Potential

WQBELs were developed for the toxic and priority pollutants that were determined to have reasonable potential to cause or contribute to exceedances of the WQC. The WQBELs were calculated based on appropriate WQC and the appropriate procedures specified in Section 1.4 of the SIP. The WQC used for each pollutant with Reasonable Potential are discussed below.

b. Dilution Credit

The SIP provides the basis for any dilution credit. The submerged diffuser is designed to achieve a minimum initial dilution of 10:1. Based on review of RMP monitoring data for the Bay, there is variability in the receiving water, and the hydrology of the receiving water is, itself, very complex. Therefore, there is uncertainty regarding the representative nature of ambient background data, which is used for determination of effluent limitations. Pursuant to section 1.4.2.1 of the SIP, "dilution credit may be limited or denied on a pollutant-by-pollutant basis...." The Regional Water Board has determined that, except for ammonia and cyanide, a conservative 10:1 dilution credit (D=9) for non-bioaccumulative priority pollutants and a zero dilution credit for bioaccumulative pollutants are necessary for protection of beneficial uses. The detailed basis for each are explained below.

(1) For certain bioaccumulative pollutants dilution credit is not included in calculating the final WQBELs. This determination is based on available data on concentrations of these pollutants in aquatic organisms, sediment, and the water column. For Central San Francisco Bay, the Regional Water Board placed mercury and polychlorinated biphenyls (PCBs) on the 303 (d) list. The USEPA added dioxin and furan compounds, selenium, chlordane, dieldrin, and 4,4'-DDT to the CWA Section 303(d) list. The reasoning for these decisions is based on the following factors that suggest there is no more assimilative capacity in the Bay for these pollutants.

Samples of tissue taken from fish in the San Francisco Bay show the presence of these pollutants at concentrations greater than screening levels. (*Contaminant Concentrations in Fish from San Francisco Bay*, May 1997). The Office of Environmental Health and Hazard Assessment (OEHHA) also completed a preliminary review of data in the 1994 San Francisco Bay pilot study, *Contaminated Levels in Fish Tissue from San Francisco Bay*. The

results of the study also showed elevated levels of chemical contaminants in fish tissues. In December 1994, OEHHA subsequently issued an interim consumption advisory covering certain fish species in the Bay. This advisory is still in effect for exposure to sport fish that are found to be contaminated with mercury, dioxins and furans, and pesticides (e.g., DDT).

For selenium, the denial of dilution credits is based on Bay waterfowl tissue data presented in the California Department of Fish and Game's Selenium Verification Study (1986-1990). These data show elevated levels of selenium in the livers of waterfowl that feed on bottom dwelling organisms such as clams. Additionally, in 1987, the Office of Environmental Health Hazard Assessment issued an advisory for the consumption of two species of diving ducks located in the North Bay, because they were found to have high tissue levels of selenium. This advisory is still in effect.

(2) Section 2.1.1 of the SIP states that for bioaccumulative compounds on the 303(d) list, the Regional Water Board should consider whether mass-loading limits should be limited to current levels. The Regional Water Board finds that mass-loading limits are warranted for mercury and selenium for the receiving waters of this discharger. This is to ensure that this discharger does not contribute further to impairment of the narrative objective for bioaccumulation. For mercury, however, subsequent to the adoption of the mercury watershed permit, mercury levels do not apply to this permit.

(3) For non-bioaccumulative constituents (except for ammonia and cyanide), a conservative allowance of 10:1 dilution for discharges to the Bay has been assigned for protection of beneficial uses. The 10:1 dilution allowance was granted in the previous order and is also based on the Basin Plan's Prohibition Number 1, which prohibits discharges with less than 10:1 dilution. Limiting the dilution credit is based on SIP provisions in Section 1.4.2. The dilution credit is also based on SIP section 1.4.2, which considers the following:

(a) A far-field background station is appropriate because the receiving water body is a very complex estuarine system with highly variable and seasonal upstream freshwater inflows and diurnal tidal saltwater inputs. The SIP allows background conditions to be determined on a discharge-by-discharge or water body-by-water body basis (SIP §1.4.3). Consistent with the SIP, Regional Water Board staff have chosen to use a water body-by-water body basis due to inherent uncertainties in characterizing ambient background conditions in a complex estuarine system on a discharge-by-discharge basis.

The Yerba Buena Island RMP monitoring station, relative to other RMP stations, fits the guidance criteria of the SIP for establishing background conditions. The SIP requires that background water quality data be representative of the ambient receiving water that will mix with the discharge. Regional Water Board staff believe that water quality data from

the Yerba Buena Island RMP monitoring station is representative of the water that will mix with discharges from the Treatment Plant.

(b) Because of the complex hydrology of the San Francisco Bay, a mixing zone has not been established. There are uncertainties in accurately determining the mixing zones for each discharge. The models that have been used to predict dilution have not considered the three dimensional nature of the currents in the estuary resulting from the interaction of tidal flushes and seasonal fresh water outflows. Being heavier and colder than fresh water, ocean salt water enters the Bay on twice day tidal cycles, generally beneath the warmer fresh water which flows seaward during wet seasons. When these waters mix and interact, complex circulation patterns occur due to varying densities of the fresh and ocean waters. The complex patterns occur throughout the estuary but are most prevalent in the San Pablo, Carquinez Straight, and Suisun Bay areas. The locations of this mixing and interaction change, depending on the strength of each tide and rate of delta outflow. Additionally, sediment loads to the Bay from the Central Valley change on a longer term basis, affecting the depth of different parts of the Bay and resulting in alteration of flow patterns and mixing and dilution that is achieved at an outfall.

(c) The SIP allows limiting a mixing zone and dilution credit for persistent pollutants. Discharges to the Bay are defined by the SIP as incompletely mixed discharges; therefore, dilution credit should be determined using site specific information. Section 1.4.2.2 of the SIP specifies that the Regional Water Board shall "significantly limit a mixing zone and dilution credit as necessary to protect beneficial uses... For example, in determining the extent of a mixing zone or dilution credit, the RWQCB shall consider the presence of pollutants in the discharge that are... persistent." The SIP defines persistent pollutants as "substances for which degradation or decomposition in the environment is nonexistent or very slow." The pollutants at issue here are persistent pollutants (e.g., copper). Dilution studies that estimate actual dilution do not address the effects of these persistent pollutants in the Bay environment, including long term effects on sediment concentrations.

(d) Non-persistent pollutants, such as ammonia and cyanide, will degrade and disperse rapidly. Because of this, an actual initial dilution is appropriate in determining WQBELs for ammonia and cyanide.

(i) For ammonia, a non-persistent pollutant, a conservative estimated actual initial dilution was used to calculate the effluent limitations. This is justified because ammonia, a non-persistent pollutant, is quickly dispersed and degraded to a non-toxic state, and cumulative toxicity effects are unlikely. The estimated actual initial dilution was calculated using the Cornell Mixing Zone Expert System (CORMIX) software program. The model results were reported in a technical memorandum prepared by Larry Walker Associates for the Discharger

(September 26, 2007). The study estimated actual initial acute and chronic dilution ratios of 83 and 88, respectively, (D = 82 and 87) for wet weather flows of 21.5 MGD (maximum daily) and 16.4 MGD (four day average). Flow conditions were based on the combined discharges from Sanitary District No. 5 of Marin County Treatment Plant and the Sewerage of Southern Marin Waste Water Treatment Plant since both agencies use Discharge Point 001 for effluent disposal. The effluent limitations based on the acute criterion were calculated using the acute dilution ratio (D=82) and the effluent limitations based on the chronic criterion were calculated using the chronic dilution ratio (D=87). Both dilution ratios were determined assuming lower-low water conditions.

(ii) For cyanide, another non-persistent pollutant that quickly disperses and degrades like ammonia, a dilution ratio of 75:1 (or D = 74) was used to calculate the water quality based effluent limits. Since the proposed cyanide site-specific objectives included an antidegradation analysis, which concluded that certain effluent limitations resulting from the implementation of the site-specific objectives (assuming 10:1 dilution) would not degrade water quality, the dilution credit used here is the dilution credit that results in effluent limits no greater than those identified in the site-specific objectives documents for the Discharger. This resultant dilution credit for cyanide is also in compliance with SIP Section 1.4.2.2, which requires that mixing zones be as small as practicable. Additionally, consistent with the site-specific objective, to ensure that water quality is not degraded, this Order requires a cyanide action plan.

c. Calculation of Pollutant Specific WQBELs

1. Copper

(a) *Copper WQC.* The chronic and acute marine WQC for copper from the Basin Plan are 3.1 and 4.8 micrograms per liter (µg/L), respectively, expressed as dissolved metal. Regional Water Board staff converted these WQC to total recoverable metal using the site-specific translators of 0.74 (chronic) and 0.88 (acute), and a Water Effects Ratio (WER) of 1.0, recommended by the CEP's *North of Dumbarton Bridge Copper and Nickel Development and Selection of Final Translators* (2005). The resulting chronic WQC of 4.2 µg/L and acute WQC of 5.5 µg/L were used to perform the RPA.

(b) *RPA Results.* This Order establishes effluent limitations for copper because the MEC of 6.6 µg/L exceeds the WQC for copper, demonstrating Reasonable Potential by Trigger 1, as previously described.

(c) *Copper WQBELs.* WQBELs are calculated based on the CTR's WQC and the site-specific WQOs established in the Basin Plan Amendment, Regional Water Board Resolution R2-2007-0042 (June 13, 2007) that was based on the Staff Report "Copper Site-Specific Objective in San Francisco Bay". Both sets of criteria are expressed as total recoverable metal using the site-specific translators and water effects ratio (WER) of 2.4 recommended by the CEP. The following table compares effluent limitations for copper calculated according to SIP procedures (and a coefficient of variation of 0.22) using the two sets of criteria, described above. The limitations take into account the deep water nature of the discharge, and are therefore based on a minimum initial dilution of 10 to 1, in accordance with the Basin Plan.

Table F-10. Effluent Limitations for Copper

Effluent Limitations for Copper		
	AMEL	**MDEL**
Based on CTR Criteria	72 µg/L	98 µg/L
Based on SSOs	54 µg/L	73 µg/L

(d) *Immediate Compliance Feasible.* Statistical analysis of effluent data for copper, collected over the period of April 2004 through March 2007, shows that the 95th percentile (6.6 µg/L) is less than the AMEL (72 µg/L); the 99th percentile (7.7 µg/L) is less than the MDEL (98 µg/L); and the mean (4.7 µg/L) is less than the long term average of the projected normal distribution of the effluent data set after accounting for effluent variability (61 µg/L). The Regional Water Board concludes, therefore, that immediate compliance with final effluent limitations for copper is feasible; final effluent limitations will become effective upon adoption of this Order.

(e) *Alternate Limitations for Copper.* As described in the CEP's *North of Dumbarton Bridge Copper and Nickel Site-Specific Objective Determination* (December 2004), the Regional Water Board has approved site-specific objectives for copper in non-ocean, marine waters of the Region. The proposed SSOs for copper are 2.5 and 3.9 µg/L as four-day and one-hour average (i.e., chronic and acute) criteria, respectively. If these SSOs for copper are adopted, final effluent limitations, calculated according to Section 1.4 of the SIP, using a WER of 2.4, would be an AMEL of 54 µg/L and an MDEL of 73 µg/L (MDEL). If these SSOs for copper are adopted, the alternate effluent limitations will become immediately effective upon the adoption date, so long as the SSOs and their current justification remain unchanged.

(f) Anti-backsliding. Anti-backsliding requirements are satisfied as Order R2-2002-0097 did not include final effluent limitations for copper.

2. Selenium

(a) *Selenium WQC.* The most stringent applicable WQC for selenium are the NTR acute and chronic saltwater criteria, 20 µg/L and 5.0 µg/L, respectively.

(b) *RPA Results.* This Order establishes effluent limitations for selenium because the MEC (6.0 µg/L) exceeds the governing criterion of 5.0 µg/L, demonstrating Reasonable Potential by Trigger 1.

(c) *Selenium WQBELs.* Final WQBELs for selenium have been calculated according to SIP procedures, as an AMEL of 3.7 µg/L and an MDEL of 9.0 µg/L using a CV of 0.91. No dilution credit was granted in these calculations, since selenium is on the 303(d) list and no assimilative capacity exists.

(d) *Immediate Compliance Infeasible.* The Discharger's Feasibility Study asserts that the facility cannot immediately comply with the final WQBELs for selenium. Statistical analysis of effluent selenium data from November 2003 through October 2006 shows that the 95th percentile (4.9 µg/L) is greater than the AMEL (3.7 µg/L); the 99th percentile (9.1 µg/L) is greater than the MDEL (9.0 µg/L); while the mean (1.6 µg/L) is less than the long term average of the projected lognormal distribution of the data set after accounting for effluent variability (2.0 µg/L). Based on this analysis, the Regional Water Board concurs with the Discharger's assertion of infeasibility to comply with final WQBELs for selenium. In January 2008, EPA Region 9 approved use of cell technology in ICPMS compliance reporting for Clean Water Act purposes. Use of this analytical process for selenium provides the greatest matrix interference removal capability. The Dscharger has been analyzing effluent selenium using the helium collision cell process and the results have been approximately 30% of results using EPA Method 200.8 in the normal mode. Removing the known interferences with Method 200.8 (chloride, fluoride, salinity) may eliminate the Discharger's compliance issues with selenium.

(e) *Need for Cease and Desist Order.* Pursuant to State Water Board Order WQ-2007-0004, compliance schedules are not authorized for effluent limitations based on numeric objectives or criteria that were in effect prior to the SIP. This includes the NTR criteria for selenium. Because it is infeasible for the Discharger to immediately comply with final WQBELs for selenium, the Discharger will likely discharge in violation of this Order. A Cease and Desist Order, therefore, has been proposed concurrently with this Order. The Cease and Desist Order is necessary to ensure that the Discharger achieves compliance. It establishes time schedules for the Discharger to complete necessary analytical investigative, preventative, and remedial actions to address its imminent and threatened violations. If the Discharger can demonstrate compliance with final effluent limits through the implementation of new analytical techniques, e.g., helium

collision cell technology, the additional actions specified in the Cease and Desist Order will not apply.

(f) *Anti-backsliding.* Anti-backsliding requirements are satisfied because the previous Order did not contain final effluent limitations for selenium.

3. Cyanide

(a) *Cyanide WQC.* The most stringent applicable WQC criteria for cyanide are established by the NTR for protection of aquatic life in San Francisco Bay. The NTR establishes both the saltwater Criterion Maximum Concentration (acute criterion) and the Criterion Chronic Concentration (chronic criterion) at 1.0 µg/L.

(b) *RPA Results.* This Order establishes effluent limitations for cyanide because the MEC of 13 µg/L exceeds the governing WQC of 1.0 µg/L, demonstrating Reasonable Potential by Trigger 1.

(c) *Cyanide WQBELs.* For cyanide, a non-persistent pollutant that quickly disperses and degrades, a dilution factor of 75:1 was used to calculate WQBELs. Final WQBELs, calculated according to SIP procedures and using a CV of 0.8, are an AMEL of 20 µg/L and an MDEL of 45 µg/L.

(d) *Immediate Compliance Feasible.* Statistical analysis of effluent data for cyanide, collected over the period of April 2004 through March 2007, shows that the 95th percentile (9.8 µg/L) is less than the AMEL (20 µg/L); the 99th percentile (17 µg/L) is less than the MDEL (45 µg/L); and the mean (3.5 µg/L) is less than the long term average of the projected lognormal distribution of the effluent data set after accounting for effluent variability (11 µg/L). Based on this analysis, the Regional Water Board concludes that immediate compliance with final effluent limitations for cyanide is feasible.

(e) *Site Specific Objective (SSO) for Cyanide.* As described in the Basin Plan Amendment approved by the Regional Water Board, Resolution R2-2006-0086, December 13, 2006, and the Staff Report on Proposed Site – Specific Objectives for Cyanide for San Francisco Bay, December 4, 2006, the proposed site-specific criteria for marine waters are 2.9 µg/L as a four-day average, and 9.4 µg/L as a one-hour average. With these objectives, and the dilution granted for CN, a less stringent WQBEL could be calculated. However, because it is feasible for the Discharger to comply with the final WQBEL calculated using current federal criteria as described in 3(c) above, and because of antidegradation requirements, the Discharger's cyanide limits will be unchanged after the CN SSO becomes effective.

(g) *Anti-backsliding.* Anti-backsliding requirements are satisfied, as Order R2-2002-0097 did not include final effluent limitations for cyanide.

4. Dioxin-TEQ

(a) *WQC.* The Basin Plan narrative WQO for bioaccumulative substances states:

> *Many pollutants can accumulate on particulates, in sediments, or bioaccumulate in fish and other aquatic organisms. Controllable water quality factors shall not cause a detrimental increase in concentrations of toxic substances found in bottom sediments or aquatic life. Effects on aquatic organisms, wildlife, and human health will be considered.*

Because it is the consensus of the scientific community that dioxins and furans associate with particulates, accumulate in sediments, and bioaccumulate in the fatty tissue of fish and other organisms, the Basin Plan's narrative bioaccumulation WQO is applicable to these pollutants. Elevated levels of dioxins and furans in fish tissue in San Francisco Bay demonstrate that the narrative bioaccumulation WQO is not being met. USEPA has therefore included the Central San Francisco Bay as impaired by dioxin and furan compounds in the 303 (d) list of receiving waters where water quality objectives are not being met after imposition of applicable technology-based requirements.

The CTR establishes a numeric WQO for 2,3,7,8-tetrachlorinated dibenzo-p-dioxin (2,3,7,8-TCDD) of 1.4×10^{-8} µg/L for the protection of human health, when aquatic organisms are consumed. When the CTR was promulgated, USEPA stated its support of the regulation of other dioxin and dioxin-like compounds through the use of toxicity equivalencies (TEQs) in NPDES permits. For California waters, USEPA stated specifically, "if the discharge of dioxin or dioxin-like compounds has reasonable potential to cause or contribute to a violation of a narrative criterion, numeric WQBELs for dioxin or dioxin-like compounds should be included in NPDES permits and should be expressed using a TEQ scheme." [65 Fed. Reg. 31682, 31695 (2000)] This procedure, developed by the World Health Organization (WHO) in 1998, uses a set of toxicity equivalency factors (TEFs) to convert the concentration of any congener of dioxin or furan into an equivalent concentration of 2,3,7,8-TCDD. 40 CFR 122.44((d)(1)(vi) allows a State, which has not established water quality criteria for specific pollutants (in this case 2,3,7,8-TCDD congeners), to establish effluent limits using one or more of prescribed options (A), (B) or (C). Option C allows the establishment of effluent limitations on an indicator parameter for the pollutant of concern, in this case, the toxicity equivalent factor, relating the congener to a pollutant with specified numeric limits, is the indicator parameter.

To determine if the discharge of dioxin or dioxin-like compounds from the Treatment Plant has reasonable potential to cause or contribute to a violation of the Basin Plan's narrative bioaccumulation WQO, Regional Water Board staff used TEFs to express the measured concentrations of 16 dioxin congeners in effluent and background samples as 2,3,7,8-TCDD equivalents. These "equivalent" concentrations were then summed and compared to the CTR numeric criterion for 2,3,7,8-TCDD (1.4×10^{-8} µg/L). Although the 1998 WHO scheme includes TEFs for dioxin-like PCBs, they are not included in this Order's version of the TEF procedure. The CTR has established a specific water quality standard for dioxin-like PCBs, and they are included in the analysis of total PCBs.

(b) *RPA Results*. This Order establishes effluent limitations for dioxin-TEQ because the maximum ambient background concentration (7.1×10^{-8}µg/L) exceeds the CTR numeric water quality criterion for 2,3,7,8-TCDD (1.4×10^{-8} µg/L), and dioxin-TEQ was detected in the effluent (MEC = 3.2×10^{-9} µg/L), demonstrating Reasonable Potential by Trigger 2, as previously described.

(c) *WQBELs*. WQBELs for dioxin-TEQ, calculated using SIP procedures as guidance, are an AMEL of 1.4×10^{-8} µg/L and an MDEL of 2.8×10^{-8} µg/L based on a default CV of 0.6. Because dioxin-TEQ is a bioaccumulative pollutant on the 303(d) list, these limitations are calculated without credit for dilution.

(d) *Immediate Compliance Infeasible*. The MEC for dioxin-TEQ (3.2×10^{-9} µg/L) is lower than the AMEL (1.40×10^{-8} µg/L) and MDEL (2.8×10^{-8} µg/L). As noted in the Discharger's November 2007 Infeasibility Analysis however, this MEC is based on analysis of only two samples collected in March and October 2002 and is the equivalent from one congener (OCDD). Given this minimal data set, there would be considerable uncertainty about the Discharger's ability to comply with any effluent limit and thus no interim limits have been established. Therefore, immediate compliance with effluent limitations for dioxin-TEQ may be infeasible.

(e) *Anti-backsliding*. Anti-backsliding requirements are satisfied, as Order R2-2007-0097 did not include a limitation for dioxin-TEQ.

5. Bis(2-ethylhexyl)phthalate

(a) *Bis(2-ethylhexyl)phthalate WQC.* The most stringent applicable water quality criterion is 5.9 µg/L, established by the CTR for the protection of human health, when organisms are consumed from the receiving water.

(b) *RPA Results.* This Order establishes effluent limitations for bis(2-ethylhexylphthalate because the MEC (7.0 µg/L) exceeds the governing WQC (5.9 µg/L), demonstrating Reasonable Potential by Trigger 1.

(c) *WQBELs.* Final WQBELs for bis(2-ethylhexyl)phthalate, calculated according to SIP procedures, and using a default CV of 0.6, are 58 µg/L and 120 µg/L as the AMEL and MDEL respectively. These limitations take into account the deep nature of the discharge, and therefore, in accordance with the Basin Plan, are based on a minimal initial dilution of 10:1.

(d) *Immediate Compliance Feasible.* With insufficient data to determine the distribution of the data set or to calculate a mean or standard deviation, feasibility to comply was determined by comparing the MEC (7.0 µg/L) to the AMEL (58 µg/L) and the MDEL (120 µg/L). Based on this comparison, the Regional Water Board has determined it is feasible for the Discharger to immediately comply with the final WQBELs for bis(2-ethylhexyl)phthalate.

(e) *Anti-backsliding.* Anti-backsliding requirements are satisfied, as the previous Order did not contain final effluent limitations for bis(2-ethylhexyl)phthalate.

6. Ammonia

(a) *Ammonia WQC.* The Basin Plan contains WQC for un-ionized ammonia of 0.025 milligrams per liter (mg/L) as an annual median, 0.16 mg/L as a maximum north of the Golden Gate Channel, and 0.4 mg/L as a maximum south of the Golden Gate Channel. The WQOs are translated from un-ionized ammonia concentrations to equivalent total ammonia concentrations (as nitrogen), since (1) sampling and laboratory methods are not available to analyze for un-ionized ammonia; and (2) the fraction of total ammonia that exists in the toxic un-ionized form depends on the pH, salinity and temperature of the receiving water.

To translate the Basin Plan unionized ammonia objective, Regional Water Board staff used pH, salinity and temperature data from March 1993 to August 2001 from the Richardson Bay RMP monitoring station, the nearest monitoring station to the outfall. The following equation was used to determine the fraction of total ammonia in a discharge that would be converted to the toxic un-ionized form in estuarine and marine receiving waters (USEPA, *1989, Ambient Water Quality Criteria for Ammonia (Saltwater)–1989*, EPA Publication No. 440/5-88-004):

For salinity > 10 ppt: fraction of NH_3 = 1/1+10(pK-pH)

Where:

pK = 9.245 + 0.116*(I) + 0.0324*(298-T) + 0.0415*(P)/(T+273)
I = the molal ionic strength of saltwater = 19.9273*(S)/(1000-1.005109*S)
S = Salinity (parts per thousand)
T = temperature in degrees Celsius

P = Pressure (one atmosphere)

To convert the Basin Plan's chronic un-ionized ammonia WQO to an equivalent total ammonia concentration, the median un-ionized ammonia fraction at the Richardson Bay monitoring station was used. To convert the Basin Plan's acute un-ionized ammonia WQO to an equivalent total ammonia concentration, the 90th percentile un-ionized ammonia fraction at Richardson Bay was used. Using the 90th percentile and median to express the acute and chronic un-ionized ammonia WQOs as equivalent total ammonia concentrations is consistent with USEPA guidance on translating dissolved metal WQOs to total recoverable metal WQC (USEPA, 1996, *The Metals Translator: Guidance for Calculating a Total Recoverable Limit from a Dissolved Criterion,* EPA Publication Number 823-B-96-007). The equivalent total ammonia acute and chronic WQOs are 4.65 mg/L and 1.19 mg/L, respectively.

(b) *RPA Results*. The SIP methodology was used to perform the RPA and to calculate effluent limitations. To set limitations for toxic pollutants, the Basin Plan (Section 4.5.5.2) indicates that WQBELs shall be calculated according to the SIP. Section 3.3.20 of the Basin Plan refers to ammonia as a toxic pollutant; therefore, it is consistent with the Basin Plan to use SIP methodology to determine and establish effluent limitations for ammonia. This Order establishes effluent limitations for total ammonia because the MEC of 41 mg/L exceeds the most stringent, applicable WQC (1.19 mg/L) for this pollutant, demonstrating Reasonable Potential by Trigger 1.

(c) *WQBELs*. The total ammonia WQBELs calculated according to SIP procedures (and a CV of 0.39) are an AMEL of 100 mg/L and an MDEL of 210 mg/L. To calculate total ammonia limits, some statistical adjustments were made because the Basin Plan's chronic WQO for un-ionized ammonia is based on an annual median, while chronic criteria are usually based on a 4-day average; also, the SIP assumes a monthly sampling frequency of 4 days per month to calculate effluent limitations based on chronic criteria. To use SIP methodology to calculate effluent limits for a Basin Plan objective that is based on an annual median, an averaging period of 365 days and a monitoring frequency of 30 days per month (the maximum daily sampling frequency in a month since the averaging period for a chronic criterion is longer than 30 days) were used. These statistical adjustments are supported by USEPA's *Water Quality Criteria; Notice of Availability; 1999 Update of Ambient Water Quality Criteria for Ammonia,* published on December 22, 1999, in the Federal Register.

Following SIP methodology as guidance, Regional Water Board staff used the maximum ambient background total ammonia concentration to calculate effluent limitations based on the acute criterion; and the median background total ammonia concentration to calculate effluent limitations based on the chronic criterion. Because the Basin Plan's chronic un-

ionized ammonia objective is an annual median, the median background concentration is more representative of ambient conditions than a daily maximum.

The WQBELs were calculated using a dilution factor of 88:1 for the chronic criteria and 83:1 for the acute criteria. The most stringent, governing calculated WQBELs are based on the chronic criteria. The determination of the dilution ratios is described in Section IV.C.4.b.(3)(i) of the Fact Sheet.

(d) *Plant Performance and Attainability*. Statistical analysis of effluent data for total ammonia collected over the period of August 2004 through March 2007 shows that the 95th percentile (29.8 mg/L) is less than the AMEL (104 mg/L); the 99th percentile (34.6 mg/L) is less than the MDEL (204 mg/L); and the mean (18.0 mg/L) is less than the long-term average of the projected normal distribution of the effluent data set after accounting for effluent variability (92 mg/L). Based on this analysis, the Regional Water Board concludes that immediate compliance with final effluent limitations for ammonia is feasible.

(e) *Anti-backsliding.* Anti-backsliding requirements are satisfied as Order R2-2002-0097 did not contain effluent limitations for ammonia.

d. Effluent Limit Calculations

The following table shows the WQBEL calculations for copper, mercury, selenium, cyanide, dioxin-TEQ, bis(2-ethylhexyl)phthalate, and ammonia. Subsequent to the adoption of the mercury watershed permit, mercury limits do not apply to this permit.

Table F-11. Effluent Limit Calculations

PRIORITY POLLUTANTS	Copper		Mercury	Selenium	Cyanide		Dioxin TEQ	Bis(2-Ethylhexyl)Phthalate	Total Ammonia (acute)	Total Ammonia (chronic)
Units	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L	ug/L N	ug/L N
Basis and Criteria type	BP SW Aq. Life	Alternate limits using SSOs (December 2004)	BP SW Aq. Life	NTR Criterion for the Bay	NTR Criterion for the Bay	Alternate Limits Using Proposed SSOs	CTR HH	CTR HH	Basin Plan Aq. Life	Basin Plan Aq. Life
CTR Criteria -Acute	5.5	-----	-----	-----	1.0	9.4	-----	-----	-----	-----
CTR Criteria -Chronic	4.2	-----	-----	-----	1.0	2.9	-----	-----	-----	-----
SSO Criteria -Acute (December 2004) (Diss.)		3.9								
SSO Criteria -Chronic (December 2004) (Diss.)		2.5								
Water Effects ratio (WER)	2.4	2.4	1	1	1	1	1	1	1	1
Lowest WQO	4.2		0.025	5.0	1.0	1.0	1.4E-08	5.9	4650	1190
Site Specific Translator - MDEL	0.88	0.88	-----							
Site Specific Translator - AMEL	0.74	0.74	-----							
Dilution Factor (D) (if applicable)	9	9	0	0	74	9	0	9	82	87
No. of samples per month	4	4	4	4	4	4	4	4	4	30
Aquatic life criteria analysis required? (Y/N)	Y	Y	Y	Y	Y	Y	N	N	Y	Y
HH criteria analysis required? (Y/N)	N	N	Y	N	Y	Y	Y	Y	N	N
Applicable Acute WQO	13.1	10.64	2.1	20	1	9.4			4650	
Applicable Chronic WQO	10.1	8.11	0.025	5.0	1	2.9				1190
HH criteria	-----	-----	0.051	-----	220000	220000	1.4E-08	5.9	0.0	87.0
Background (Maximum Conc for Aquatic life calc)	2.55	2.55	0.0086	0.39	0.4	0.4	7.1E-08	0.091	170	90
Background (Average Conc for Human Health calc)	-----	-----	0.0022	-----	0.4	0.4	5.00E-08	0.091	-----	-----
Is the pollutant Bioaccumulative(Y/N)? (e.g., Hg)	N	N	Y	Y	N	N	Y	N	N	N
ECA acute	108	83	2.1	20.00	45.4	90.4			372010	No Acute WQO
ECA chronic	78	58	0.025	5.00	45.4	25.4			No Chronic WQO	96890
ECA HH	-----	-----	0.051	-----	16499970	2199996	1.4E-08	5.82	-----	-----
No. of data points <10 or at least 80% of data reported non detect? (Y/N)	N	N	N	N	N	N	Y	Y	N	N
Avg of effluent data points	4.7	4.7	0.0040	1.6	3.5	3.5			18041	18041
Std Dev of effluent data points	1.0	1.0	0.0051	1.4	2.7	2.7			7120	7120
CV calculated	0.22	0.22	1.26	0.91	0.8	0.8	N/A	N/A	0.39	0.39
CV (Selected) - Final	0.22	0.22	1.26	0.91	0.8	0.8	0.60	0.6	0.39	0.39
ECA acute mult99	0.62	0.62	0.17	0.22	0.25	0.25			0.444	
ECA chronic mult99	0.78	0.78	0.31	0.40	0.44	0.44				0.953
LTA acute	66.8	51.6	0.4	4.5	11.4	22.7			165057	
LTA chronic	61	45	0.0077	2.0	20.1	11				92365
minimum of LTAs	61	45	0.0077	2.0	11.41	11			165057	92365
AMEL mult95	1.2	1.2	2.2	1.9	1.7	1.7	1.6	1.6	1.35	1.12
MDEL mult99	1.6	1.6	6.0	4.5	4.0	4.0	3.1	3.1	2.25	2.25
AMEL (aq life)	72	54	0.017	3.7	19.9	19.6			223346	103704
MDEL(aq life)	98	73	0.046	9.0	45.4	44.7			372010	208173
MDEL/AMEL Multiplier	1.36	1.36	2.74	2.42	2.28	2.28	2.01	2.0	1.7	2.01
AMEL (human hlth)	-----	-----	0.051	-----	16499970	2199996	1.4E-08	58.181		0
MDEL (human hlth)			0.140		37668541	5022473	2.8E-08	116.72209		0
minimum of AMEL for Aq. life vs HH	72.0	54.0	0.017	4	19.9	19.6	1.4E-08	58.181	223346	103704
minimum of MDEL for Aq. Life vs HH	97.9	73.3	0.046	9	45.4	44.7	2.8E-08	116.72209	372010	208173
Current limit in permit (30-day average)	------	------	0.087 (interim)	-------	------	------	-----	-----	----	----
Current limit in permit (daily)	37 (interim)	37 (interim)	------	50 (interim)	25 (interim)	25 (interim)	----	-----	----	----
Final limit - AMEL	72	54	0.017	3.7	20	20	1.4E-08	58	----	103704
Final limit - MDEL	98	73	0.046	9.0	45	45	2.8E-08	117	----	208173
Max Effl Conc (MEC)	6.6	6.6	0.033	6.0	13	13	3.2E-09	7	41000	41000

5. Whole Effluent Acute Toxicity

a. Representative samples of the effluent at Discharge Point 001 shall meet the following limits for acute toxicity:

The survival of organisms in undiluted combined effluent shall be an eleven (11) sample median value of not less than 90 percent survival, and an eleven (11) sample 90 percentile value of not less than 70 percent survival.

b. These acute toxicity limitations are further defined as follows:

11 sample median: A bioassay test showing survival of less than 90 percent represents a violation of this effluent limit, if five or more of the past ten or less bioassay tests show less than 90 percent survival.

90th percentile: A bioassay test showing survival of less than 70 percent represents a violation of this effluent limit, if one or more of the past ten or less bioassay tests show less than 70 percent survival.

c. Bioassays shall be conducted in compliance with Section V.A of the Monitoring and Reporting Program (MRP, Attachment E).

Bioassays shall be performed using the most up-to-date USEPA protocol and the most sensitive species as specified in writing by the Executive Officer based on the most recent screening test results. Bioassays shall be conducted in compliance with "Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms," currently 5th Edition (EPA-821-R-02-012), with exceptions granted to the Discharger by the Executive Officer and the Environmental Laboratory Accreditation Program (ELAP) upon the Discharger's request with justification.

d. If the Discharger can demonstrate to the satisfaction of the Executive Officer that toxicity exceeding the levels cited above is caused by ammonia and that the ammonia in the discharge is in compliance with effluent limitations, then such toxicity does not constitute a violation of this effluent limitation. This is based on the Basin Plan Section 3.3.20) "Un-Ionized Ammonia." If ammonia toxicity is verified in the TIE, the Discharger may utilize an adjustment protocol approved by the Executive Officer for routine bioassay testing.

6. Whole Effluent Chronic Toxicity

a. Compliance with the Basin Plan narrative chronic toxicity objective shall be demonstrated according to the following tiered requirements based on results from representative samples of the treated final effluent at Discharge Point 001 meeting test acceptability criteria and Section V.B of the MRP (Attachment E). Failure to conduct the required toxicity tests or a TRE within 30 days of the trigger can result in the establishment of effluent limitations for chronic toxicity.

(1) Conduct annual routine monitoring.

(2) Accelerate monitoring after exceeding a single-sample maximum of 10 chronic toxicity units (TUc), consistent with Table 4-5 of the Basin Plan for dischargers monitoring chronic toxicity annually. Accelerated monitoring shall consist of four (4) chronic toxicity tests conducted once every two weeks using the species that exhibited toxicity.

(3) Return to routine monitoring if accelerated monitoring does not exceed the "trigger" in (2), above.

(4) If accelerated monitoring confirms consistent toxicity above the "trigger" in (2), above, initiate toxicity identification evaluation/toxicity reduction evaluation (TIE/TRE) in accordance with a workplan submitted in accordance with Section V.B.3 of the MRP (Attachment E), and that incorporates any and all comments from the Executive Officer.

(5) Return to routine monitoring after appropriate elements of TRE workplan are implemented and either the toxicity drops below "trigger" levels in (2), above, or, based on the results of the TRE, the Executive Officer authorizes a return to routine monitoring.

b. Test Species and Methods

The Discharger shall conduct routine monitoring with the test species and protocols specified in Section V.B of the MRP (Attachment E). The Discharger shall also perform Chronic Toxicity Screening Phase monitoring as described in the Appendix E-1 of the MRP (Attachment E). Chronic Toxicity Monitoring Screening Phase Requirements, Critical Life Stage Toxicity Tests and definitions of terms used in the chronic toxicity monitoring are identified in Appendices E-1 and E-2 of the MRP (Attachment E).

For the term of this Order, the species *Mysidopsis bahia* has been approved by the Regional Board for chronic toxicity monitoring. The Discharger submitted a request by letter dated April 18, 2005 to utilize the results of screening phase chronic toxicity monitoring conducted by Sausalito-Marin City Sanitary District in lieu of facility specific screening. The Regional Board granted this request, considering the cost of screening phase chronic toxicity monitoring, the similarity of the Treatment Plant to that of Sausalito-Marin City, and that the Sewerage Agency of Southern Marin, with whom the Sanitary District No. 5 shares an outfall, was also permitted to use the chronic toxicity screening results. Chronic Toxicity Screening Phase monitoring must be completed, however, prior to the expiration of this Order. The Screening Phase monitoring for the Discharger may again be completed in conjunction with Sausalito-Marin City and the Sewerage Agency of Southern Marin.

D. Final Effluent Limitations

1. Following is a summary of the technology-based and water quality-based effluent limitations established by this Order for Discharge Point E-001.

a. Conventional and Non-Conventional Pollutants

Table F-12. Summary of Effluent Limitations for Conventional and Non-Conventional Pollutants

Parameter	Units	Effluent Limitations					Basis
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum	
Oil and Grease	mg/L	10	---	20	---	---	(1)
pH	standard units	---	---	---	6.0	9.0	(2)
TSS	mg/L	30	45	---	---	---	(2)
BOD_5	mg/L	30	45	---	---	---	(2)
Chlorine, Total Residual	mg/L	---	---	---	---	0.0	(1)

(1) Basin Plan
(2) 40 CFR 133 Secondary Treatment Regulation

The Discharger shall also comply with the following effluent limitations.

(1) **BOD_5 and TSS 85% Percent Removal.** The average monthly percent removal of BOD_5 and TSS shall not be less than 85 percent.

(2) **Total Coliform Bacteria.** The treated wastewater shall meet the following limits of bacteriological quality:

i. The median value based on minimum of five consecutive samples equally spaced over a 30-day period analyzed for total coliform should not exceed 240 MPN/100mL.

ii. Any single sample should not exceed 10,000 MPN/ 100 mL.

b. Effluent Limitations for Toxic Pollutants

Table F-13. Summary of Effluent Limitations for Toxic Pollutants

Parameters	Units	Final Effluent Limits		Basis
		AMEL	MDEL	
Copper [1]	µg/L	72	98	Basin Plan, SW Criteria
Selenium	µg/L	3.7	9.0	NTR, SW Criteria
Cyanide [2]	µg/L	20	45	NTR, SW Criteria
Dioxin-TEQ	µg/L	1.4×10^{-8}	2.8×10^{-8}	Basin Plan, Narrative
Bis(2-ethylhexl)phthalate	µg/L	58	120	CTR, Human Health
Ammonia (total as N)	mg/L	100	210	Basin Plan WQO

[1] Alternate Effluent Limits for Copper:

a. If a copper SSO for the receiving water becomes legally effective, resulting in adjusted saltwater Criterion Continuous Concentration of 2.5 µg/L and Criterion Maximum Concentration (CMC) of 3.9 µg/L (Basin Plan Amendment approved by the Regional Water Board Resolution R2-2007-0042, June 13, 2007, based on the Staff Report "Copper Site-Specific Objective in San Francisco Bay" June 6, 2007). Upon its effective date, the following limitations shall supersede those copper limitations listed in Table 7: AMEL of 54 µg/L and MDEL of 73 µg/L.

b. If a different copper SSO for the receiving water is adopted, the alternate WQBELs based on the SSO will be determined after the SSO effective date.

[2] Alternate Effluent Limits for Cyanide

a. If a cyanide SSO for the receiving water becomes legally effective, resulting in adjusted saltwater Criterion Continuous Concentration of 2.9 µg/L (Basin Plan Amendment approved by the Regional Water Board Resolution R2-2006-0086, December 13, 2006, based on Staff Report on Proposed Site-Specifice Objectives for Cyanide for San Francisco Bay). Upon its effective date, the following limitations shall supersede those cyanide limitations listed in Table 7: AMEL of 20 µg/L and MDEL of 45 µg/L.

c. If a different cyanide SSO for the receiving water is adopted, the alternate WQBELs based on the SSO will be determined after the SSO effective date.

c. **Acute Toxicity.** The Discharger shall comply with the following limitations for whole effluent acute toxicity.

11 sample median: A bioassay test showing survival of less than 90 percent represents a violation of this effluent limit, if five or more of the past ten or less bioassay tests show less than 90 percent survival.

90th percentile: A bioassay test showing survival of less than 70 percent represents a violation of this effluent limit, if one or more of the past ten or less bioassay tests show less than 70 percent survival.

2. **Anti-Backsliding/Antidegradation.**

a. **Effluent Limitations Retained from Order No. R2-2002-0097**. Limitations for the following parameters are retained and are unchanged from Order No. R2-2002-0097.

- Oil and grease
- pH
- BOD_5 and TSS
- Total residual chlorine
- 85 % removal requirement for BOD_5 and TSS
- Total coliform bacteria

- Acute toxicity

By retaining effluent limitations for these parameters in the tentative Order, these limitations are at least as stringent as those in Order No. R2-2002-0097, meeting applicable anti-backsliding requirements of the Clean Water Act.

b. **New Effluent Limitations**. Final, concentration-based limitations for the following parameters were not contained in Order No. R2-2002-0097 and are established by the tentative Order.

- Copper
- Selenium
- Cyanide
- Dioxin-TEQ
- Bis(2-ethylhexyl)phthalate
- Ammonia

The establishment of effluent limitations for copper, selenium, cyanide, bis(2-ethylhexyl)phthalate, dioxin-TEQ, and ammonia effectively creates more stringent limitations than in the previous Order, therefore meeting applicable anti-backsliding requirements and ensuring that the existing quality of the receiving water will not be degraded (in terms of these parameters) as a result of the tentative Order.

c. **More Stringent Effluent Limitations**. No limitations established by Order No. R2-2002-0097 for are made more stringent by the tentative Order.

d. **Effluent Limitations Not Retained from Order No. R2-2002-0097.** Final limitations for the following parameters are not retained by the tentative Order.

- Settleable matter
- Lead
- Nickel
- Silver
- Zinc

Effluent limitations for settleable matter have not been retained by this Order. For the Treatment Plant, like other facilities achieving secondary or more advanced levels of treatment, the Regional Water Board has determined that compliance with the requirements of 40 CFR 133 and of Table 4-2 of the Basin Plan will also assure removal of settleable solids to acceptably low levels - below 0.1 ml/L/hr (30 day average) and 0.2 ml/L/hr (daily maximum).

Order No. R2-2002-0097 included final effluent limitations for lead, nickel, silver and zinc; however, because the reasonable potential analysis showed that discharges from the Treatment Plant no longer demonstrate a reasonable potential to cause or contribute to exceedances of applicable water quality

criteria for these pollutants, limitations from the previous permit are not retained, and new limitations are not included in the Order.

E. Interim Effluent Limitations

Not Applicable.

F. Land Discharge Specifications

Not Applicable.

G. Reclamation Specifications

Not Applicable.

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

A. Surface Water

Receiving water limitations are retained from the previous Order and reflect applicable water quality standards from the Basin Plan.

B. Groundwater

Not Applicable.

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS (PROVISIONS B)

The principal purposes of a monitoring program by a discharger are to:

- Document compliance with waste discharge requirements and prohibitions established by the Regional Water Board.
- Facilitate self-policing by the discharger in the prevention and abatement of pollution arising from waste discharge.
- Develop or assist in the development of limitations, discharge prohibitions, national standards of performance, pretreatment and toxicity standards, and other standards.
- Prepare water and wastewater quality inventories.

The MRP is a standard requirement in almost all NPDES permits issued by the Regional Water Board, including this Order. It contains definitions of terms, specifies general sampling and analytical protocols, and sets out requirements for reporting of spills, violations, and routine monitoring data in accordance with NPDES regulations, the California Water Code, and Regional Water Board's policies. The MRP also defines the