

III. INFLUENT MONITORING REQUIREMENTS

The Discharger shall monitor influent to the facility at INF-001 as follows.

Table E-3. Influent Monitoring

Parameter	Units	Sample Type	Minimum Sampling Frequency
Flow ⁽¹⁾	MGD/MG	Cont/D	Cont
CBOD ₅	mg/L	C-24	1/week
	kg/day	Calculate	1/week
TSS	mg/L	C-24	1/week
	kg/day	Calculate	1/week
Cyanide	µg/L	Grab	1/month

Legends for Table E-3

(1) Unit Abbreviations

- MGD = million gallons per day
- MG = million gallons
- mg/L = milligrams per liter
- kg/day = kilograms per day
- µg/L = micrograms per liter

(2) Sample type

- Cont = continuous monitoring
- Cont/D = measured continuously and recorded and reported daily
- C-24 = 24-hour composite

(3) Sampling frequency

- 1/week = once per week
- 1/month = once per month

Footnote for Table E-3:

- (1) Flows shall be monitored continuously and the following shall be reported in monthly self-monitoring reports:
 - a. Daily average flow rate (MGD)
 - b. Daily total flow volume (MG)
 - c. Monthly average flow rate (MGD)
 - d. Monthly total flow volume (MG)
 - e. Average daily maximum and average daily minimum flow rates (MGD) in a month
- (2) The Discharger may elect to monitor CBOD as BOD, as defined in the latest edition of *Standard Methods for the Examination of Water and Wastewater*.

IV. EFFLUENT MONITORING REQUIREMENTS

The Discharger shall monitor treated effluent discharged from the Plant at EFF-001 and EFF-002 (flow only) as follows.

Table E-4. Effluent Monitoring

Parameter	Units	Sample Type	Minimum Sampling Frequency
Flow Rate ⁽¹⁾	MGD/MG	Cont/D	Cont
CBOD ₅	mg/L	C-24	1/week
	kg/day	C-24	1/week
TSS	mg/L	C-24	1/week
	kg/day	C-24	1/week
CBOD ₅ and TSS percent removal ⁽²⁾	%	Calculate	1/month
pH ⁽³⁾	s.u.	Grab	1/day
Oil and Grease ⁽⁴⁾	mg/L	Grab	1/quarter
	kg/day	composites	
Turbidity	NTU	Grab	1/day
Total Chlorine Residual ⁽⁵⁾	mg/L	Cont/H	1/hour
	kg/day	Calculate	1/hour
Enterococcus Bacteria	cfu/100 mL	Grab	5/week
Temperature	°C	Grab	1/day
Dissolved Oxygen (DO)	mg/L	Grab	1/day
	% Saturation	Grab	1/day
Dissolve Sulfides (if DO < 5 mg/L) ⁽⁶⁾	mg/L	Grab	1/day
Total Ammonia Nitrogen	mg/L as N	C-24	⁽⁷⁾
	kg/day as N	C-24	⁽⁷⁾
Unionized Ammonia Nitrogen	mg/L as N	Calculate	⁽⁷⁾
Acute Toxicity ⁽⁸⁾	% survival	Flow through	1/month
Chronic Toxicity ⁽⁹⁾	TUc	C-24	⁽⁹⁾
Copper	µg/L	C-24	1/month
Nickel	µg/L	C-24	1/month
Cyanide	µg/L	Grab	1/month
Dioxin-TEQ ⁽¹⁰⁾	µg/L	Grab	2/year
Endrin	µg/L	Grab	1/quarter
Tributyltin	µg/L	Grab	1/quarter
Remaining Priority Pollutants ⁽¹¹⁾	µg/L	⁽¹⁰⁾	2/year
Standard Observations ⁽¹²⁾	---	---	1/week

Legends for Table E-4:

(1) Unit Abbreviations

- MGD = million gallons per day
- MG = million gallons
- mg/L = milligrams per liter
- µg/L = micrograms per liter
- s.u. = standard units
- NTU = Nephelometric turbidity units
- ml/L-hr = milliliters per liter, per hour
- kg/day = kilograms per day
- °C = degrees Celsius
- cfu/100 mL = colony-forming units per 100 milliliters
- TUc = chronic toxic units

(2) Sample Type Abbreviations

- Cont = measured continuously
- Cont/D = measured continuously, and recorded and reported daily

Cont/H = measured continuously, and recorded and reported hourly
 C-24 = 24-hour composite
 Flow-through = continuously pumped sample during duration of toxicity test

- (3) Sampling frequency
- 1/hour = once per hour
 - 1/day = once per day
 - 5/week = five times per week
 - 1/week = once per week
 - 1/month = once per month
 - 1/quarter = once per quarter
 - 2/year = twice per year

Footnotes for Table E-4:

- (1) **Flow.** Flows shall be monitored continuously and the following shall be reported in monthly self-monitoring reports for both EFF-001 and 002 unless otherwise specified:
- a. Daily average flow rate (MGD) (averaging period is 24 hours)
 - b. Daily average flow rate while discharging to Moffett Channel and daily discharge duration in hours (averaging period is the actual discharge duration) (EFF-001 only)
 - c. Average daily maximum and average daily minimum flow rates (MGD) in a month (averaging period is 24 hours),
 - d. Average daily maximum and average daily minimum flow rates (MGD) in a month while discharging to Moffett Channel (averaging period is the actual discharge duration) (EFF-001 only),
 - e. Daily total Moffett Channel discharge flow volume (EFF-001) or daily total effluent flow volume (EFF-002) (MG),
 - f. Monthly total Moffett Channel discharge flow volume (MG) (EFF-001)
 - g. Monthly total duration when discharging to Moffett Channel (hour) (EFF-001 only)
 - h. Monthly total flow volume (MG) (EFF-002)
 - i. Monthly average discharge flow rate to Moffett Channel based on (f) and (g) above (EFF-001) and monthly effluent flow rate (EFF-002) (MGD)
- (2) **CBOD₅ and TSS.** The percent removal for CBOD₅ and TSS shall be reported for each calendar month in accordance with Effluent Limitation IV.A.2. Samples for CBOD₅ and TSS shall be collected simultaneously with influent samples.
- (3) **pH.** If pH is monitored continuously; the minimum and maximum pH values for each day shall be reported in monthly self-monitoring reports.
- (4) **Oil and Grease.** Each oil and grease sampling event shall consist of a composite sample comprised of three grab samples taken at equal intervals during the sampling date, with each grab sample being collected in a glass container. The grab samples shall be mixed in proportion to the instantaneous flow rates occurring at the time of each grab sample, within the accuracy of plus or minus 5%. Each glass container used for sample collection or mixing shall be thoroughly rinsed with solvent as soon as possible after use, and the solvent rinsate shall be added to the composite sample for extraction and analysis.
- (5) **Total Chlorine Residual.** Effluent chlorine concentrations shall be monitored continuously. Chlorine residual concentrations shall be monitored and reported for sampling points both before and after dechlorination. The Discharger shall report the maximum residual chlorine concentration observed following dechlorination on a daily basis. Total chlorine dosage (kg/day) shall be recorded on a daily basis.

Alternatively, the Discharger may evaluate compliance with this requirement by recording discrete readings from the continuous monitoring every hour on the hour, or by collecting grab samples every hour, for a total of 24 readings or samples per day if the following conditions are met: (a) The Discharger shall retain continuous monitoring readings for at least three years; (b) The Discharger shall acknowledge in writing that the Regional Water Board reserves the right to use all other continuous monitoring data for discretionary enforcement; (c) The Discharger must provide in writing the brand name(s), model number(s), and serial number(s) of the equipment used to continuously monitor dechlorinated final effluent chlorine residual. If the identified equipment is replaced, the Discharger shall provide the Regional Water

Board in writing, within 72 hours of the successful startup of the new equipment, the new equipment's brand name, model number, and serial number. The written notification identified in items (a) through (c) shall be in the form of a letter addressed to the Regional Water Board's Executive Officer with a certification statement as listed in the October 19, 2004, Regional Water Board letter re: *Chlorine Compliance Strategy for Dischargers Using Continuous Monitoring Devices*.

- (6) **Dissolved Sulfides.** Monitoring for dissolved sulfides shall occur when D.O. concentrations are less than 5 mg/L.
- (7) **Total Ammonia Nitrogen and Un-ionized Ammonia Nitrogen.** Sampling frequency shall be 1/week (once per week) during October-April and 1/month (once per month) during May-September.
- (8) **Acute Toxicity.** Acute bioassay tests shall be performed in accordance with Section V.A of this MRP.
- (9) **Chronic toxicity.** Critical life stage toxicity tests shall be performed and reported in accordance with the Chronic Toxicity Requirements specified in Section V.B of the MRP. Sampling frequency is specified in V.B.1.c., except during the period when the Discharger is conducting the "Chronic Toxicity Identification and Toxicity Reduction Study" as required by Provision VI.C.2.d i, when the sampling frequency would be those specified for the study.
- (10) **Dioxin-TEQ.** Chlorinated dibenzodioxins and chlorinated dibenzofurans shall be analyzed using the latest version of USEPA Method 1613; the analysis shall be capable of achieving one half the USEPA method 1613 Minimum Levels. Alternative methods of analysis must be approved by the Executive Officer. In addition to reporting results for each of the 17 congeners, the dioxin-TEQ shall be calculated and reported using 1998 USEPA Toxicity Equivalent Factors for dioxin and furan congeners.
- (11) **Remaining priority pollutant.** The sample type and analytical method should be as described in the Regional Standard Provisions (Attachment G) or as amended and subsequently approved by the Executive Officer.
- (12) **Standard observations.** As specified in the Regional Standard Provisions (Attachment G).

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

The Discharger shall monitor acute and chronic toxicity at EFF-001 as follows.

A. Whole Effluent Acute Toxicity

1. Compliance with the acute toxicity effluent limitations of this Order shall be evaluated by measuring survival of test organisms exposed to 96-hour continuous flow-through bioassays.
2. Test organisms shall be rainbow trout (*Onchorhynchus mykiss*) unless specified otherwise in writing by the Executive Officer.
3. All bioassays shall be performed according to the most up-to-date protocols in 40 CFR 136, currently in *Methods for Measuring the Acute Toxicity of Effluents and Receiving Water to Freshwater and Marine Organisms*, 5th Edition.
4. If specific identifiable substances in the discharge can be demonstrated by the Discharger as being rapidly rendered harmless upon discharge to the receiving water, compliance with the acute toxicity limit may be determined after the test samples are adjusted to remove the influence of those substances. Written approval from the Executive Officer must be obtained to authorize such an adjustment.

5. Effluent used for fish bioassays must be dechlorinated prior to testing. Monitoring of the bioassay water shall include, on a daily basis, the following parameters: pH, dissolved oxygen, total ammonia, un-ionized ammonia (by calculation, if toxicity is observed), temperature, hardness, and alkalinity. These results shall be reported. If a violation of acute toxicity requirements occurs or if the control fish survival rate is less than 90 percent, the bioassay test shall be restarted with new batches of fish and shall continue back to back until compliance is demonstrated.

B. Whole Effluent Chronic Toxicity

1. Chronic Toxicity Monitoring Requirements

- a. **Sampling.** The Discharger shall collect 24-hour composite samples of the effluent at monitoring location EFF-001, for critical life stage toxicity testing as indicated below. For toxicity tests requiring renewals, 24-hour composite samples collected on consecutive days are required.
- b. **Test Species.** The test species shall be *Americamysis bahia*. The Discharger shall conduct a screening chronic toxicity test as described in Appendix E-1 following any significant change in the nature of the effluent. The most sensitive species shall be used for routine chronic toxicity monitoring. The Executive Officer may change to another test species if data suggest that another test species is more sensitive to the discharge.
- c. **Frequency.** The frequency of routine and accelerated chronic toxicity monitoring shall be as specified below, except during the period when the Discharger is conducting the "Chronic Toxicity Identification and Toxicity Reduction Study" as required by Provision VI.C.2.d *i*, when the sampling frequency would be those specified for the study:

(1) Routine Monitoring: Monthly

(2) Accelerated Monitoring: Twice/Month

The Discharger shall conduct accelerated monitoring twice per month after exceeding a three-sample median of 1 TUc or a single sample maximum of 2 TUc for discharges via Discharge Point 001, or as otherwise specified by the Executive Officer.

Monitoring conducted pursuant to a TIE/TRE effort shall satisfy the requirements for routine and accelerated monitoring while the TIE/TRE investigation is underway.

- d. **Methodology.** Sample collection, handling, and preservation shall be in accordance with USEPA protocols. In addition, bioassays shall be conducted in compliance with the most recently promulgated test methods, as shown in Appendix E-1. These are *Short-Term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Marine and Estuarine Organisms*, currently third edition (EPA-821-R-02-014), and *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, currently fourth Edition (EPA-821-R-02-013), with exceptions granted the Discharger by the Executive Officer and the Environmental Laboratory Accreditation Program (ELAP).

- e. **Dilution Series.** The Discharger shall conduct tests with a control and five effluent concentrations (including 100% effluent) and using a dilution factor ≥ 0.5 . Test sample pH in each dilution in the series may be controlled to the level of the effluent sample as received prior to being salted up.

2. Chronic Toxicity Reporting Requirements

- a. **Routine Reporting.** Toxicity test results for the current reporting period shall include, at a minimum, for each test:
 - (1) Sample date(s)
 - (2) Test initiation date
 - (3) Test species
 - (4) End point values for each dilution (e.g., number of young, growth rate, percent survival)
 - (5) NOEC value(s) in percent effluent
 - (6) IC₁₅, IC₂₅, IC₄₀, and IC₅₀ values (or EC₁₅, EC₂₅ ... etc.) as percent effluent
 - (7) TUC values (100/NOEC, 100/IC₂₅, or 100/EC₂₅)
 - (8) Mean percent mortality (\pm s.d.) after 96 hours in 100% effluent (if applicable)
 - (9) NOEC and LOEC values for reference toxicant test(s)
 - (10) IC₅₀ or EC₅₀ value(s) for reference toxicant test(s)
 - (11) Available water quality measurements for each test (pH, D.O., temperature, conductivity, hardness, salinity, ammonia)

- b. **Compliance Summary.** The results of the chronic toxicity testing shall be provided in the self-monitoring report and shall include a summary table of chronic toxicity data from at least eleven of the most recent samples. The information in the table shall include items listed above under 2.a, specifically item numbers (1), (3), (5), (6) (IC₂₅ or EC₂₅), (7), and (8).

VI. LAND DISCHARGE MONITORING REQUIREMENTS

Not Applicable.

VII. RECLAMATION MONITORING REQUIREMENTS

Not Applicable.

VIII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER

The Discharger shall continue to participate in the Regional Monitoring Program (RMP), which involves collection of data on pollutants and toxicity in water, sediment and biota of the Estuary. The Discharger's participation and support of the RMP is used in consideration of the level of receiving water monitoring required by this Order.

IX. PRETREATMENT AND BIOSOLIDS MONITORING REQUIREMENTS

The Discharger shall comply with the pretreatment requirements specified in Table E-5 for influent (at Monitoring Location INF-001), effluent (at Monitoring Location EFF-001), and biosolids monitoring.

Table E-5. Pretreatment and Biosolids Monitoring Requirements

Constituents	Sampling Frequency			Sample Type ⁽⁵⁾	
	Influent INF-001	Effluent ⁽³⁾ EFF-001	Biosolids ⁽⁴⁾	INF-001 & EFF-001	Biosolids ^(5d)
VOC	2/year	2/year	---	multiple grabs ^(5a)	grabs
BNA	2/year	2/year	---	multiple grabs ^(5a)	grabs
Metals ⁽¹⁾	1/month	1/month	2/year	24-hour composite ^(5b)	grabs
Hexavalent Chromium ⁽²⁾	1/month	1/month	2/year	multiple grabs ^(5a)	grabs
Mercury	1/month	1/month	2/year	24-hour composite ^(5b,5c)	grabs
Cyanide	1/month	1/month	2/year	multiple grabs ^(5a)	grabs

Legends for Table E-5:

- VOC = volatile organic compounds
 BNA = base/neutrals and acids extractable organic compounds
 N/A = not applicable
 1/month = once per month
 2/year = twice per year

Footnotes for Table E-5:

- (1) The parameters are arsenic, cadmium, copper, lead, nickel, silver, zinc, and selenium.
- (2) The Discharger may elect to run total chromium instead of hexavalent chromium. Sample collection for total chromium measurements may also use 24-hour composite sampling.
- (3) Effluent monitoring conducted in accordance with Table E-4 can be used to satisfy these pretreatment monitoring requirements.
- (4) Sample types:
 - a. Multiple grabs samples for VOC, BNA, hexavalent chromium, and cyanide, must be made up of a minimum of four (4) discrete grab samples, collected equally spaced over the course of a 24-hour period, with each grab analyzed separately and the results mathematically flow-weighted or with grab samples combined (volumetrically flow-weighted) prior to analysis.
 - b. 24-hour composite sample may be made up discrete grab samples and may be combined (volumetrically flow-weighted) prior to analysis, or they should be mathematically flow-weighted. If automatic compositor is used, 24-hour composite samples must be obtained through flow-proportioned composite sampling.
 - c. Automatic compositors are allowed for mercury if either 1) the compositing equipment (hoses and containers) comply with ultraclean specifications, or 2) appropriate equipment blank samples demonstrate that the compositing equipment has not contaminated the sample. This direction is consistent with the Regional Water Board's October 22, 1999, letter on this subject.
 - d. Biosolids collection should comply with those requirements for sludge monitoring specified in Attachment H, Appendix H-3 of this of the Order for sludge monitoring. The biosolids analyzed shall be a composite sample of the biosolids for final disposal. The Discharger shall also comply with biosolids monitoring requirements required by 40 CFR 503.

X. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

The Discharger shall comply with the federal Standard Provisions (Attachment D) and the Regional Standard Provisions (Attachment G) related to monitoring, reporting, and recordkeeping.

B. Self Monitoring Reports (SMRs)

1. At any time during the term of this permit, the State or Regional Water Board may notify the Discharger to electronically submit SMRs using the State Water Board's California Integrated Water Quality System (CIWQS) Program website (<http://www.waterboards.ca.gov/ciwqs/index.html>). Until such notification is given, the Discharger shall submit hard copy SMRs. The CIWQS website will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.
2. The Discharger shall report in the SMR the results for all monitoring specified in this MRP under sections III through VIII. The Discharger shall submit monthly SMRs, including the results of all required monitoring using USEPA-approved test methods or other test methods specified in this Order. Monthly SMRs shall be due 30 days after the end of each calendar month. If the Discharger monitors any pollutant more frequently than required by this Order, the results of this monitoring shall be included in the calculations and reporting of the data submitted in the SMR. Annual SMRs shall be due by February 1 of each year, covering the previous calendar year. The report shall contain the items described in the Regional Standard Provisions (Attachment G).
3. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-6. Monitoring Periods

Sampling Frequency	Monitoring Period Begins On...	Monitoring Period
Continuous	Permit effective date	All
1/hour	Permit effective date	Every hour on the hour
1/day	Permit effective date	(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.
1/week	Permit effective date	Sunday through Saturday
1/month	Permit effective date	First day of calendar month through last day of calendar month
1/quarter	Permit effective date	Once during January 1 – March 31, April 1- June 30, July 1 – September 30, and October 1 – December 31
2/year	Permit effective date	Once during wet season (typically November 1 through April 30), once during dry season (typically May 1 through October 31)

4. The Discharger shall report with each sample result the applicable reported ML and the current Method Detection Limit (MDL), as determined by the procedure in 40 CFR 136. The

Discharger shall report the results of analytical determinations for the presence of chemical constituents in a sample using the following reporting protocols:

- a. Sample results greater than or equal to the reported ML shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).
- b. Sample results less than the Reporting Level (RL), but greater than or equal to the laboratory's MDL, shall be reported as "Detected, but Not Quantified," or DNQ. The estimated chemical concentration of the sample shall also be reported.

For the purposes of data collection, the laboratory shall write the estimated chemical concentration next to DNQ as well as the words "Estimated Concentration" (may be shortened to "Est. Conc."). The laboratory may, if such information is available, include numerical estimates of the data quality for the reported result. Numerical estimates of data quality may be percent accuracy (+ a percentage of the reported value), numerical ranges (low to high), or any other means considered appropriate by the laboratory.

- c. Sample results less than the laboratory's MDL shall be reported as "Not Detected," or ND.
- d. Dischargers are to instruct laboratories to establish calibration standards so that the ML value (or its equivalent if there is differential treatment of samples relative to calibration standards) is the lowest calibration standard. At no time is the Discharger to use analytical data derived from extrapolation beyond the lowest point of the calibration curve.
- e. Compliance Determination. Compliance with effluent limitations for priority pollutants shall be determined using sample reporting protocols defined above, Attachment A, and Table E-1, priority pollutant MLs of this Order. For purposes of reporting and administrative enforcement by the Regional and State Water Boards, the Discharger shall be deemed out of compliance with effluent limitations if the concentration of the priority pollutant in the monitoring sample is greater than the effluent limitation and greater than or equal to the RL.
- f. When determining compliance with an average monthly effluent limit (AMEL) (or an average weekly effluent limit) for priority pollutants and more than one sample result is available, the Discharger shall compute the arithmetic mean unless the data set contains one or more reported determinations of DNQ or ND. In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:
 - (1) The data set shall be ranked from low to high, ranking the reported ND determinations lowest, DNQ determinations next, followed by quantified values (if any). The order of the individual ND or DNQ determinations is unimportant.
 - (2) The median value of the data set shall be determined. If the data set has an odd number of data points, then the median is the middle value. If the data set has an even number of data points, then the median is the average of the two values around

the middle unless one or both of the points are ND or DNQ, in which case the median value shall be the lower of the two data points where DNQ is lower than a value and ND is lower than DNQ.

5. The Discharger shall submit SMRs in accordance with the following requirements: The Discharger shall arrange all reported data in a tabular format. The data shall be summarized to clearly illustrate whether the facility is operating in compliance with interim and/or final effluent limitations. The Discharger is not required to duplicate the submittal of data that is entered in a tabular format within CIWQS. When electronic submittal of data is required and CIWQS does not provide for entry into a tabular format within the system, the Discharger shall electronically submit the data in a tabular format as an attachment.

The Discharger shall attach a cover letter to the SMR. The information contained in the cover letter shall (1) clearly identify violations of the WDRs, (2) discuss corrective actions taken or planned, and (3) propose time schedule for corrective actions. Identified violations must include a description of the requirement that was violated and a description of the violation.

SMRs must be submitted to the Regional Water Board, signed and certified as required by the Standard Provisions (Attachment D), to the address listed below:

Executive Officer
 California Regional Water Quality Control Board
 San Francisco Bay Region
 1515 Clay Street, Suite 1400
 Oakland, CA 94612
 ATTN: NPDES Permit Division

C. Discharge Monitoring Reports (DMRs)

1. As described in Section XI.B.1 above, at any time during the term of this Order, the State or Regional Water Board may notify the Discharger to electronically submit SMRs that will satisfy federal requirements for submittal of DMRs. Until such notification is given, the Discharger shall submit DMRs in accordance with the requirements described below.
2. DMRs must be signed and certified as required by the standard provisions (Attachment D). The Discharge shall submit the original DMR and one copy of the DMR to one of the addresses listed below:

Standard Mail	FedEx/UPS/Other Private Carriers
State Water Resources Control Board Division of Water Quality c/o DMR Processing Center PO Box 100 Sacramento, CA 95812-1000	State Water Resources Control Board Division of Water Quality c/o DMR Processing Center 1001 I Street, 15 th Floor Sacramento, CA 95814

3. All discharge monitoring results must be reported on the official USEPA pre-printed DMR forms (EPA Form 3320-1). Forms that are self-generated will not be accepted unless they follow the exact same format of EPA Form 3320-1.

D. Other Reports

In the first monthly SMR following the respective due dates, the Discharger shall report the results of any special studies, monitoring, and reporting required by Section VI.C.2 (Special Studies, Technical Reports, and Additional Monitoring Requirements) of this Order. The Discharger shall include a report of progress towards meeting compliance schedules established by Section VI.C.7 of this Order.

APPENDIX E-1**CHRONIC TOXICITY
DEFINITION OF TERMS AND SCREENING PHASE REQUIREMENTS****I. Definition of Terms**

- A. No observed effect level (NOEL) for compliance determination is equal to IC_{25} or EC_{25} . If the IC_{25} or EC_{25} cannot be statistically determined, the NOEL shall be equal to the NOEC derived using hypothesis testing.
- B. Effective concentration (EC) is a point estimate of the toxicant concentration that would cause an adverse effect on a quantal, "all or nothing," response (such as death, immobilization, or serious incapacitation) in a given percent of the test organisms. If the effect is death or immobility, the term lethal concentration (LC) may be used. EC values may be calculated using point estimation techniques such as probit, logit, and Spearman-Kärber. EC_{25} is the concentration of toxicant (in percent effluent) that causes a response in 25 percent of the test organisms.
- C. Inhibition concentration (IC) is a point estimate of the toxicant concentration that would cause a given percent reduction in a nonlethal, nonquantal biological measurement, such as growth. For example, an IC_{25} is the estimated concentration of toxicant that would cause a 25 percent reduction in average young per female or growth. IC values may be calculated using a linear interpolation method such as USEPA's Bootstrap Procedure.
- D. No observed effect concentration (NOEC) is the highest tested concentration of an effluent or a toxicant at which no adverse effects are observed on the aquatic test organisms at a specific time of observation. It is determined using hypothesis testing.

II. Chronic Toxicity Screening Phase Requirements

- A. The Discharger shall perform screening phase monitoring:
 1. Subsequent to any significant change in the nature of the effluent discharged through changes in sources or treatment, except those changes resulting from reductions in pollutant concentrations attributable to source control efforts, or
 2. Prior to permit reissuance. Screening phase monitoring data shall be included in the NPDES permit application for reissuance. The information shall be as recent as possible, but may be based on screening phase monitoring conducted within 5 years before the permit expiration date.
- B. Design of the screening phase shall, at a minimum, consist of the following elements:
 1. Use of test species specified in Appendix E-2, attached, and use of the protocols referenced in those tables, or as approved by the Executive Officer.

2. Two stages:
 - a. Stage 1 shall consist of a minimum of one battery of tests conducted concurrently. Selection of the type of test species and minimum number of tests shall be based on Appendix E-2 (attached).
 - b. Stage 2 shall consist of a minimum of two test batteries conducted at a monthly frequency using the three most sensitive species based on the Stage 1 test results and as approved by the Executive Officer.
 3. Appropriate controls.
 4. Concurrent reference toxicant tests.
 5. Dilution series with a control and five effluent concentrations (including 100% effluent) and using a dilution factor ≥ 0.5 .
- C. The Discharger shall submit a screening phase proposal acceptable to the Executive Officer. The proposal shall address each of the elements listed above. If within 30 days, the Executive Officer does not comment, the Discharge shall commence with screening phase monitoring.

APPENDIX E-2

SUMMARY OF TOXICITY TEST SPECIES REQUIREMENTS

Table AE-1. Critical Life Stage Toxicity Tests for Estuarine Waters

Species	(Scientific Name)	Effect	Test Duration	Reference
Alga	(<i>Skeletonema costatum</i>) (<i>Thalassiosira pseudonana</i>)	Growth rate	4 days	1
Red alga	(<i>Champia parvula</i>)	Number of cystocarps	7-9 days	3
Giant kelp	(<i>Macrocystis pyrifera</i>)	Percent germination; germ tube length	48 hours	2
Abalone	(<i>Haliotis rufescens</i>)	Abnormal shell development	48 hours	2
Oyster Mussel	(<i>Crassostrea gigas</i>) (<i>Mytilus edulis</i>)	Abnormal shell development; percent survival	48 hours	2
Echinoderms - Urchins Sand dollar	(<i>Strongylocentrotus purpuratus</i> , <i>S. franciscanus</i>) (<i>Dendraster excentricus</i>)	Percent fertilization	1 hour	2
Shrimp	(<i>Mysidopsis bahia</i>)	Percent survival; growth	7 days	3
Shrimp	(<i>Holmesimysis costata</i>)	Percent survival; growth	7 days	2
Topsmelt	(<i>Atherinops affinis</i>)	Percent survival; growth	7 days	2
Silversides	(<i>Menidia beryllina</i>)	Larval growth rate; percent survival	7 days	3

Toxicity Test References:

1. American Society for Testing Materials (ASTM). 1990. Standard Guide for Conducting Static 96-Hour Toxicity Tests with Microalgae. Procedure E 1218-90. ASTM, Philadelphia, PA.
2. Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to West Coast Marine and Estuarine Organisms. EPA/600/R-95/136. August 1995.
3. Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Marine and Estuarine Organisms. EPA/600/4-90/003. July 1994.

Table AE-2. Critical Life Stage Toxicity Tests for Fresh Waters

Species	(Scientific Name)	Effect	Test Duration	Reference
Fathead minnow	(Pimephales promelas)	Survival; growth rate	7 days	4
Water flea	(Ceriodaphnia dubia)	Survival; number of young	7 days	4
Alga	(Selenastrum capricornutum)	Final cell density	4 days	4

Toxicity Test Reference:

4. Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, fourth Edition Chronic manual (EPA-821-R-02-013, October 2002).

Table AE-3. Toxicity Test Requirements for Stage One Screening Phase

Requirements	Receiving Water Characteristics		
	Discharges to Coast	Discharges to San Francisco Bay ^[2]	
	Ocean	Marine/Estuarine	Freshwater
Taxonomic diversity	1 Plant 1 invertebrate 1 fish	1 Plant 1 invertebrate 1 fish	1 Plant 1 invertebrate 1 fish
Number of tests of each salinity type: Freshwater ^[1] Marine/Estuarine	0 4	1 or 2 3 or 4	3 0
Total number of tests	4	5	3

1. The freshwater species may be substituted with marine species if:
 - a. The salinity of the effluent is above 1 part per thousand (ppt) greater than 95 percent of the time, or
 - b. The ionic strength (TDS or conductivity) of the effluent at the test concentration used to determine compliance is documented to be toxic to the test species.
2.
 - a. Marine/Estuarine refers to receiving water salinities greater than 1 ppt at least 95 percent of the time during a normal water year.
 - b. Fresh refers to receiving water with salinities less than 1 ppt at least 95 percent of the time during a normal water year.

ATTACHMENT F – FACT SHEET

Table of Contents

I.	Permit Information.....	F-3
II.	Facility Description.....	F-4
	A. Description of Wastewater and Biosolids Treatment or Controls.....	F-4
	1. Wastewater Treatment Processes.....	F-4
	2. Collection System.....	F-6
	3. Reclamation.....	F-6
	4. Storm Water Discharges.....	F-6
	B. Discharge Point and Receiving Water.....	F-6
	C. Summary of Previous Requirements and Self-Monitoring Data.....	F-7
	D. Compliance Summary.....	F-9
	E. Planned Changes.....	F-10
III.	Applicable Plans, Policies, and Regulations.....	F-10
	A. Legal Authorities.....	F-10
	B. California Environmental Quality Act (CEQA).....	F-10
	C. State and Federal Regulations, Policies, and Plans.....	F-10
	D. Impaired Water Bodies on CWA 303(d) List.....	F-12
IV.	Rationale For Effluent Limitations and Discharge Specifications.....	F-13
	A. Discharge Prohibitions.....	F-13
	B. Exceptions to Basin Plan Prohibitions.....	F-14
	1. Basin Plan Discharge Prohibition 1.....	F-14
	2. History of Granting Exception to Prohibition 1.....	F-14
	3. Compliance with State Water Board Order No. 90-5.....	F-15
	4. Rationale for Continuing to Grant Exception.....	F-16
	C. Effluent Limitations for Conventional and Non-Conventional Pollutants.....	F-17
	1. Scope and Authority of Technology-Based Effluent Limitations.....	F-17
	2. Applicable Effluent Limitations.....	F-18
	D. WQBELs.....	F-22
	1. Scope and Authority.....	F-22
	2. Applicable Beneficial Uses and WQC.....	F-23
	3. Determining the Need for WQBELs.....	F-25
	4. WQBEL Calculations.....	F-33
	5. Whole Effluent Acute Toxicity.....	F-40
	6. Whole Effluent Chronic Toxicity.....	F-40
	7. Antibacksliding/Antidegradation.....	F-41
	E. Interim Effluent Limitations.....	F-42
	1. Feasibility Evaluation and Interim Effluent Limits.....	F-42
	2. Compliance Schedule Requirements.....	F-42
	F. Land Discharge Specifications.....	F-43
	G. Reclamation Specifications.....	F-43
V.	Rationale for Receiving Water Limitations.....	F-44
	A. Surface Water.....	F-44
	B. Groundwater.....	F-44

VI. Rationale for Monitoring and Reporting Requirements.....	F-44
A. Influent Monitoring	F-45
B. Effluent Monitoring.....	F-45
C. Whole Effluent Toxicity Testing Requirements	F-45
D. Receiving Water Monitoring.....	F-46
E. Pretreatment and Biosolids Monitoring Requirements	F-46
VII. Rationale for Provisions.....	F-46
A. Standard Provisions (Provision VI.A).....	F-46
B. Monitoring and Reporting Requirements (Provision VI.B).....	F-47
C. Special Provisions (Provision VI.C)	F-47
1. Reopener Provisions.....	F-47
2. Special Studies and Additional Monitoring Requirements	F-47
3. Best Management Practices and Pollution Minimization Program.....	F-48
4. Construction, Operation, and Maintenance Specifications	F-48
5. Special Provisions for Municipal Facilities (POTWs Only).....	F-49
6. Other Special Provisions	F-50
VIII. Public Participation.....	F-50
A. Notification of Interested Parties.....	F-50
B. Written Comments	F-51
C. Public Hearing.....	F-51
D. Waste Discharge Requirements Petitions.....	F-51
E. Information and Copying	F-51
F. Register of Interested Persons	F-52
G. Additional Information.....	F-52

List of Tables

Table F-1. Facility Information.....	F-3
Table F-2. Outfall Location	F-7
Table F-3. Previous Effluent Limitations and Monitoring Data for Conventional and Non-Conventional Pollutants	F-8
Table F-4. Previous Effluent Limitations and Monitoring Data for Toxic Pollutants.....	F-9
Table F-5. Compliance with Numeric Effluent Limitations.....	F-9
Table F-6. Compliance with Previous Order Provisions	F-10
Table F-7. Beneficial Uses of South San Francisco Bay	F-11
Table F-8. Secondary Treatment Requirements	F-17
Table F-9. Summary of Effluent Limitations for Conventional and Non-Conventional Pollutants.....	F-18
Table F-10. Site-Specific Translators for Cu, Ni, Zn, Cr(VI), and Pb for South San Francisco Bay...	F-25
Table F-11. Summary of RPA Results	F-30

ATTACHMENT F – FACT SHEET

As described in Section II of this Order, this Fact Sheet includes the legal requirements and technical rationale that serve as the basis for the requirements of this Order.

This Order has been prepared under a standardized format to accommodate a broad range of discharge requirements for dischargers in California. Only those sections or subsections of this Order that are specifically identified as “not applicable” have been determined not to apply to this Discharger. Sections or subsections of this Order not specifically identified as “not applicable” are fully applicable to this Discharger.

I. PERMIT INFORMATION

The following table summarizes administrative information related to the facility.

Table F-1. Facility Information

WDID	2 438018001
CIWQS Place ID	259507
Discharger	City of Sunnyvale
Name of Facility	Sunnyvale Water Pollution Control Plant and its sewage collection system
Facility Address	1444 Borregas Avenue
	Sunnyvale, CA 94088
	Santa Clara County
Facility Contact, Title, Phone	Lorrie Gervin, Environmental Division Manager, (408) 730-7268
Authorized Person to Sign and Submit Reports	Lorrie Gervin, Environmental Division Manager, (408) 730-7268, or Marvin Rose, Director of Public Works, (408) 730-7441
Mailing Address	P.O. Box 3707, Sunnyvale, CA 94088
Billing Address	Same as Mailing Address
Type of Facility	Publicly Owned Treatment Works (POTW)
Major or Minor Facility	Major
Threat to Water Quality	1
Complexity	A
Pretreatment Program	Yes, under Order No. 94-069
Mercury Discharge Requirements	Yes, under Order No. R2-2007-0077
Reclamation Requirements	Yes
Facility Permitted Flow	29.5 million gallons per day (MGD)
Facility Design Flow	29.5 MGD (average dry weather flow design capacity) with full advanced-secondary treatment
	40 MGD (peak wet weather flow design capacity) with full secondary treatment
Watershed	Santa Clara Hydrologic Unit
Receiving Water	Moffett Channel (flows to South San Francisco Bay via Guadalupe Slough)
Receiving Water Type	Estuarine
Service Areas	City of Sunnyvale, Rancho Rinconada, and Moffett Field
Service Area Population	136,000

- A. The City of Sunnyvale owns and operates the Sunnyvale Water Pollution Control Plant (Plant) and its sewage collection system (collectively the facility). The facility provides advanced-secondary treatment of the wastewater collected from its service areas and discharges to Moffett Channel, a tributary to South San Francisco Bay via Guadalupe Slough.

For the purposes of this Order, references to the "discharger" or "permittee" in applicable federal and State laws, regulations, plans, or policy are held to be equivalent to references to the Discharger herein.

- B. The discharge of treated wastewater from the Plant to Moffett Channel, a water of the United States, has been regulated by Order No. R2-2003-0079 (previous Order) and NPDES Permit No. CA0037621, which was adopted on November 1, 2003, and expired on September 30, 2008.
- C. The Discharger filed a Report of Waste Discharge (ROWD) and submitted an application for reissuance of its Waste Discharge Requirements (WDRs) and NPDES permit on April 2, 2008. The application was deemed complete and the previous Order has been administratively extended.

II. FACILITY DESCRIPTION

A. Description of Wastewater and Biosolids Treatment or Controls

1. Wastewater Treatment Processes

The Discharger owns and operates the Plant, which provides primary, secondary, and advanced-secondary treatment of domestic and commercial wastewater collected from its service areas as indicated in Table F-1. The Discharger's current service area population is approximately 136,000.

Wastewater treatment processes at the Plant include grinding and grit removal, primary sedimentation, secondary and advanced secondary treatment through the use of oxidation ponds, fixed-film reactor nitrification, dissolved air flotation, dual-media filtration, disinfection (chlorine gas), and dechlorination (sulfur dioxide).

Influent Flow Management. The Plant has sufficient capacity for influent pumping, primary treatment, and flow equalization (in the oxidation ponds) to meet any expected maximum flow condition. Three main influent pumps have a total capacity of 45 MGD, and an auxiliary pump provides an additional capacity of 25 MGD, which provides a combined pumping capacity that exceeds the capacity of the influent sewer. In addition, an emergency gravity flow bypass line exists to route influent flows around the influent pumps to the oxidation ponds; however, the bypass line has not been used since its construction in 1984. Such use would be a bypass and would be subject to all restrictions and requirements applicable to a bypass.

Preliminary Treatment. Preliminary treatment consists of grinders located 30 feet below ground, removal of large debris from the raw sewage, followed by grit removal.

Primary Treatment. Following preliminary treatment, wastewater is pumped into rectangular primary clarifiers for the removal of floatable and settled material. The floatable material is skimmed off, the settled primary solids are removed from the bottom of the clarifiers, and primary sludge is pumped to the anaerobic digesters.

Biological Treatment. All wastewater flow receives biological (secondary) treatment. Primary effluent flows by gravity into 440 acres of mechanically aerated oxidation ponds.

As wastewater circulates through the pond system, aerobic and anaerobic mechanisms degrade the organic material. The average detention time for wastewater in the pond system is 30 to 45 days. The oxidation ponds simultaneously provide flow equalization for primary effluent so advanced treatment processes can be operated at a constant flow rate. The flow equalization capacity varies with pond depth, but is typically in the range of 50-100 million gallons.

Advanced Secondary Treatment. Following biological treatment, the wastewater is pumped to the fixed growth reactors (FGRs) for advanced secondary treatment. FGRs, or trickling filters, are a biological treatment process consisting of a tank filled with corrugated plates or plastic media on which a film of microorganisms (i.e., fixed growth) is allowed to develop. At the top of the tank a large wand rotates and trickles wastewater over the plates, where ammonia in the wastewater is converted to nitrate by the microorganism film. The effluent from the FGRs flows by gravity to the dissolved air flotation tanks (DAFTs). In this step, air and polymer are injected to coagulate and flocculate residual algae and other particulate matter, which rises to the top of the tank and is skimmed off. Skimmed material is sent to the anaerobic digesters or returned to the oxidation ponds. As a final polishing step, effluent from the DAFTs is percolated through dual media filters, which provide removal of remaining algae and particulate matter via gravity filtration. The filters are periodically backwashed, and the backwash water is returned to the oxidation ponds for treatment. The average dry weather design capacity of 29.5 MGD of the Plant reflects advanced-secondary treatment capacity; peak flow capacities of the primary and secondary treatment processes are greater than 40 MGD.

Disinfection. Effluent from the filters flows to the chlorine contact channels, where chlorine gas is added as a disinfectant. The contact time is at least one hour to achieve disinfection. Sulfur dioxide is then added to achieve dechlorination before discharging to Moffett Channel through an outfall pipe.

Recycled Water Production. The Plant may enter into two different treatment modes—slough discharge wastewater treatment and recycled water production. During periods of recycled water production in high recycled water demand seasons (typically 12–16 hours a day), the DAFT polymer dose, chlorine dose, and chlorine contact time are adjusted to meet Title 22 requirements (recycled water effluent turbidity needs to be below 2 NTU versus 10 NTU for slough discharge). The portion of the effluent that is diverted to the recycled water pump station is partially dechlorinated using sodium bisulfite. During recycled water production, there is no discharge to Moffett Channel.

Effluent Flow Measuring. There is no flow meter installed at the end of the treatment process (i.e., EFF-001 as described in the MRP [Attachment E]). Discharge flow is continuously metered by eight (8) flow meters installed after filtration and before disinfection and discharge. Diverted flows, which consist of tertiary recycled water and water used on site, are also continuously monitored. The total flow, minus the diverted flow, is used to calculate the discharge flow.

Solids Management. Solids removed from wastewater by primary treatment and floc skimmed from the DAFTs are treated in the primary anaerobic digesters for approximately 37-41 days at a temperature of 100°F, followed by an additional 16 days in an unheated

secondary digester. In the digesters, anaerobic bacteria consume the solid material, and produce methane gas, carbon dioxide, stabilized organic solids, and water as products of this process. Methane gas produced in the digesters is then used as fuel to generate the Plant's engines and generators. The biosolids that remain after treatment in the digesters are conditioned with a polymer and pumped to dewatering beds, which are beds of slotted tiles that allow water to drain by gravity back into the treatment system. The sludge is dried for 1-5 days to approximately 15-20 % solids, and is then spread on a tarmac to dry to approximately 50-70% solids. The biosolids are then hauled off-site by a contractor for land application or disposal at the City of Sunnyvale's Biosolids Monofill.

Plant Electricity Generation. Methane gas generated by the digesters is used to fuel the three engine-driven pumps and an on-site cogeneration facility that produces about 50-60% of the electricity used by the Plant. The cogeneration facility has two 16 cylinder engine generator sets (each one is capable of 800 kW power generation). The Plant also uses methane gas produced by an adjacent landfill to generate 20-30% of the electrical power. The rest is supplemented by PG&E natural gas.

2. Collection System.

The Discharger's collection system is 100 % separate sanitary sewer, and includes approximately 327 miles of sanitary sewer mains and one lift station.

3. Reclamation

A fraction of tertiary treated water is recycled and used by numerous businesses throughout the service area and by the Discharger for irrigation of landscape and golf courses, and in decorative ponds. Recycled water is also available for construction use at remote locations. Currently about 10 percent of the daily flow is diverted for reuse. Disinfected secondary recycled water is used at the facility for landscape irrigation. Water recycling is accomplished in accordance with Regional Water Board Order No. 94-069, Water Reclamation Requirements for the Discharger.

4. Storm Water Discharges

All storm water from within the Plant is directed to the headworks of the Plant; therefore, this Order regulates the discharges of storm water that originate on the grounds of the Plant, and coverage under the Statewide permit for discharges of storm water associated with industrial activities (NPDES General Permit No. CAS000001) is not required.

B. Discharge Point and Receiving Water

The location of the discharge point and the receiving water are shown in Table F-2 below.

Table F-2. Outfall Location

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Advanced-secondary treated municipal wastewater	37° 25' 13" N	122° 01' 00" W	Moffett Channel

Moffett Channel is located in the Palo Alto Hydrologic Area of the Santa Clara Hydrologic Unit and is tributary to South San Francisco Bay via Guadalupe Slough.

South San Francisco Bay is a unique and sensitive portion of the San Francisco Bay Estuary, in part due to the freshwater inflow being lower there than in the greater portion of San Francisco Bay. Tributaries to South San Francisco Bay are small in number and size. It is characterized by higher, more uniform salinities and is generally shallow, except for a deep central channel. Surrounding South San Francisco Bay is an extensive network of tidal mudflats, tidal sloughs, coastal salt marshes, diked salt marshes, brackish water marshes, salt ponds, and freshwater marshes. In general, water quality in the entire San Francisco Bay can be characterized as a concentration gradient, with the lowest concentrations in Central Bay and highest concentrations in South San Francisco Bay and the southern sloughs, due to less tidal mixing and flushing in South San Francisco Bay and the southern sloughs than elsewhere in San Francisco Bay.

C. Summary of Previous Requirements and Self-Monitoring Data

Effluent limitations contained in the previous Order for discharges to Moffett Channel and representative monitoring data from the term of the previous Order are presented in the following tables.

Table F-3. Previous Effluent Limitations and Monitoring Data for Conventional and Non-Conventional Pollutants

Parameter	(units)	Effluent Limitations			Monitoring Data (1/2003-1/2008)		
		Monthly Average	Weekly Average	Daily Maximum	Highest Monthly Average	Highest Weekly Average	Highest Daily Discharge
CBOD ₅	mg/L	10	---	20	7.9	---	11
TSS	mg/L	20	---	30	15.5	---	23.5
pH	standard units	6.5 – 8.5			Minimum – 6.5 Maximum – 8.1		
Oil and Grease	mg/L	5	---	10	3.9	---	3.9
Enterococci	colonies/ 100 mL	35 ⁽¹⁾	---	276 ⁽²⁾	23 ⁽¹⁾	---	488.4 ⁽²⁾
Total Chlorine Residual	mg/L	---	---	0.0 ⁽³⁾	---	---	0.0
Settleable Matter	mL/L-hr.	0.1	---	0.2	---	---	<0.1
Turbidity	NTU	---	---	10	---	---	9.92
Acute Toxicity	% survival	11-sample median value of not less than 90 percent survival and an 11-sample 90th percentile value of not less than 70 percent survival.			Minimum 11-sample median – 95% Minimum 11-sample 90th percentile – 100%		
Ammonia-N	mg/L	2 ⁽⁴⁾	---	5 ⁽⁴⁾	17.4	---	24.1

Footnotes for Table F-3:

“<” Analyte not detected in effluent; value given is the MDL as reported by the analytical laboratory.

- (1) As a 30-day geometric mean.
- (2) As a single sample maximum.
- (3) Requirement defined as below the limit of detection in standard test methods defined in the latest USEPA approved edition of *Standard Methods for the Examination of Water and Wastewater*.
- (4) Ammonia effluent limitations apply June through September only. Effluent data during June through September were in compliance with these effluent limits.

Table F-4. Previous Effluent Limitations and Monitoring Data for Toxic Pollutants

Parameter	Units	Final Limits		Interim Limits		Monitoring Data (From 1/2003 to 1/2008)
		Daily Maximum	Monthly Average	Daily Maximum	Monthly Average	Highest Daily Concentration
Copper	µg/L	20	10	---	---	6.9
Mercury	µg/L	---	---	2.1	0.012	0.007
Nickel	µg/L	40	24	---	---	5.1
Cyanide	µg/L	---	---	32	---	10
Chlorodibromomethane	µg/L	---	---	58	---	37.2
Dichlorobromomethane	µg/L	---	---	68	---	36
Tributyltin	µg/L	0.03	0.01	---	---	0.016
4,4'-DDE	µg/L	---	---	0.05	---	<0.002
Dieldrin	µg/L	---	---	0.01	---	<0.002
Heptachlor Epoxide	µg/L	---	---	0.01	---	<0.002
Benzo(b)Fluoranthene	µg/L	---	---	10.0	---	<0.02
Indeno(1,2,3-cd)Pyrene	µg/L	---	---	0.05	---	<0.02

"<" Analyte not detected in effluent; value given is the minimum detection limit (MDL) as reported by the analytical laboratory.

D. Compliance Summary

1. **Compliance with Previous Numeric Effluent Limits.** Exceedances of numeric effluent limitations for tributyltin and enterococci were observed during the previous permit term. The exceedances are summarized in Table F-5, below.

Table F-5. Compliance with Numeric Effluent Limitations

Date of Violation	Parameter	Units	Effluent Limitation	Reported Effluent Concentration
August 31, 2004	Tributyltin	µg/L	Monthly Average – 0.01	0.02
November 30, 2007	Tributyltin	µg/L	Monthly Average – 0.01	0.016
February 2, 2008	Enterococci	MPN/100 mL	Daily Maximum – 276	2,400

A mandatory minimum penalty of \$3,000 was assessed for the two tributyltin violations, in Order R2-2004-0091 (for the August 2004 violation), and in State Water Board Order SWB-2008-2-0030 (for the November 2007 violation). No enforcement action has yet been taken for the February 2008 enterococci violation.

2. **Compliance with Chronic Toxicity Trigger.** The chronic toxicity trigger of 2.0 chronic toxicity units (TUC) as a single-sample maximum was exceeded on 20 occasions (out of 97 samples), and the trigger of 1.0 TUC as a three-sample median was exceeded on 44 occasions out of 92 3-sample median values during the previous permit term (November 2003-March 2009). This Order imposes additional requirements for the Discharger to reduce chronic toxicity. See more discussed in Fact Sheet Sections IV.D.6.
3. **Compliance with Previous Provisions.** A list of special activities required by the previous Order and the status of those requirements are shown in Table F-6, below.

Table F-6. Compliance with Previous Order Provisions

Provision Number	Requirement	Status of Completion
E.2	Avian Botulism Control Program	Annual report submitted February 2004, and annually thereafter.
E.3	Chlorodibromomethane and Dichlorobromomethane Compliance Schedule	The "Final Report for Chlorodibromomethane and Dichlorobromomethane Study" was submitted February 28, 2006.
E.4	Cyanide Compliance Schedule and SSO Study	Annual Cyanide SSO report was submitted January 28, 2004, and annually thereafter, and Cyanide Compliance Attainability Evaluation was submitted August 19, 2005.
E.5	Mercury Special Study	Reports have been submitted annually by February 28, and final report was submitted December 15, 2007.
E.10	Copper-Nickel Water Quality Attainment Strategy	Reports have been submitted annually by February 28.
E.12	Receiving Water User Survey	Report was submitted December 31, 2004.
E.14	Operations and Maintenance Manual and Reliability Report Updates	Reports have been submitted annually by February 28.
E.15	Contingency Plan Update	Reports have been submitted annually by February 28.
E.16	Annual Status Reports	Reports have been submitted annually by February 28.
E.17	303(d)-listed Pollutants Site-Specific Objective and TMDL Status Review	Reports have been submitted annually by January 31.

E. Planned Changes

Not Applicable.

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

This Order's requirements are based on the requirements and authorities described in this Section.

A. Legal Authorities

This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the USEPA and chapter 5.5, division 7 of the California Water Code (CWC or Water Code, commencing with section 13370). It shall serve as a NPDES permit for point source discharges from this facility to surface waters. This Order also serves as WDRs pursuant to article 4, chapter 4, division 7 of the CWC (commencing with section 13260).

B. California Environmental Quality Act (CEQA)

Under CWC section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA.

C. State and Federal Regulations, Policies, and Plans

- Water Quality Control Plans.** *The Water Quality Control Plan for the San Francisco Bay Basin* (the Basin Plan) is the Regional Water Board's master water quality control planning document. It designates beneficial uses and water quality objectives (WQOs) for waters of the state, including surface waters and groundwater. It also includes programs of

implementation to achieve WQOs. The Basin Plan was adopted by the Regional Water Board and approved by the State Water Board, USEPA, and the Office of Administrative Law (OAL), as required. Requirements of this Order implement the Basin Plan.

The Basin Plan does not specifically identify present and potential beneficial uses for Moffett Channel, which is a narrow inlet within South San Francisco Bay. It does identify beneficial uses for South San Francisco Bay, to which Moffett Channel is tributary via Guadalupe Slough. The Basin Plan states that the beneficial uses of any specifically identified water body generally apply to all its tributaries (Basin Plan tributary rule). Table F-7 identifies existing and potential beneficial uses of South San Francisco Bay. These beneficial uses also apply to Moffett Channel in accordance with the Basin Plan tributary rule.

State Water Board Resolution No. 88-63 establishes State policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply (MUN). Monitoring data at Guadalupe Slough station C-1-3 (about 7,000 feet downstream of the discharge outfall) ranged from 220 mg/L to 26,800 mg/L (with an average of above 11,000 mg/L), thereby meeting an exception to Resolution No. 88-63. The MUN designation is therefore not applicable to Moffett Channel.

Although South San Francisco Bay is listed to support shellfish harvesting, according to a City of San Jose report, *Alternative Effluent Bacteriological Standards Pilot Study, 2003*, representatives from the California Department of Fish and Game have stated that no shellfish harvesting occurs in the San Francisco Bay south of Foster City. In addition, the Shellfish Harvesting (SHELL) beneficial use likely does not exist in Moffett Channel or Guadalupe Slough. Both water bodies are characterized with soft mudflats and subtidal marsh, which are not suitable shellfish habitats. The Discharger's 2003 beneficial use survey of Moffett Channel and Guadalupe Slough found no attempts by the public at shellfish harvesting over a period of 18 months.

Table F-7. Beneficial Uses of South San Francisco Bay

Discharge Point	Receiving Water Name	Beneficial Uses of South San Francisco Bay
001	Moffett Channel (tributary to South San Francisco Bay via Guadalupe Slough)	Industrial Service Supply (IND) Ocean, Commercial, and Sport Fishing (COMM) Shellfish Harvesting (SHELL) Estuarine Habitat (EST) Fish Migration (MIGR) Preservation of Rare and Endangered Species (RARE) Fish Spawning (SPWN) Wildlife Habitat (WILD) Non-contact Water Recreation (REC2) Contact Recreation (REC1) Navigation (NAV)

- National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA adopted the NTR on December 22, 1992, and amended it on May 4, 1995, and November 9, 1999. About forty criteria in the NTR applied in California. On May 18, 2000, USEPA adopted the CTR. The CTR promulgated new toxics criteria for California and, in addition, incorporated the previously adopted NTR criteria that were applicable in the state. The CTR was amended on

February 13, 2001. These rules contain water quality criteria (WQC) for priority toxic pollutants, which are applicable to South San Francisco Bay.

3. **State Implementation Policy (SIP).** On March 2, 2000, the State Water Board adopted the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California* (State Implementation Policy or SIP). The SIP became effective on April 28, 2000, with respect to the priority pollutant criteria promulgated for California by the USEPA through the NTR and to the priority pollutant objectives established by the Regional Water Board in the Basin Plan. The SIP became effective on May 18, 2000, with respect to the priority pollutant criteria promulgated by the USEPA through the CTR. The State Water Board adopted amendments to the SIP on February 24, 2005, that became effective on July 13, 2005. The SIP establishes implementation provisions for priority pollutant criteria and objectives and provisions for chronic toxicity control. Requirements of this Order implement the SIP.
4. **Alaska Rule.** On March 30, 2000, USEPA revised its regulation that specifies when new and revised state and tribal water quality standards (WQS) become effective for CWA purposes [65 Fed. Reg. 24641 (April 27, 2000), codified at 40 CFR 131.21]. Under the revised regulation (also known as the Alaska Rule), new and revised standards submitted to USEPA after May 30, 2000, must be approved by USEPA before being used for CWA purposes. The final rule also provides that standards already in effect and submitted to USEPA by May 30, 2000, may be used for CWA purposes, whether or not approved by USEPA.
5. **Antidegradation Policy.** 40 CFR 131.12 requires that the state WQS include an antidegradation policy consistent with the federal policy. The State Water Board established California's antidegradation policy in State Water Board Resolution No. 68-16. Resolution No. 68-16 incorporates the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing water quality be maintained unless degradation is justified based on specific findings. The Regional Water Board's Basin Plan implements, and incorporates by reference, both the State and federal antidegradation policies. The permitted discharge must be consistent with the antidegradation provision of 40 CFR 131.12 and State Water Board Resolution No. 68-16.
6. **Anti-Backsliding Requirements.** 402(o)(2) and 303(d)(4) of the CWA and federal regulations at 40 CFR 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require that effluent limitations in a reissued permit must be as stringent as those in the previous permit, with some exceptions in which limitations may be relaxed.

D. Impaired Water Bodies on CWA 303(d) List

In November 2006, the USEPA approved a revised list of impaired water bodies prepared by the State [the 303(d) list] pursuant to provisions of CWA section 303(d), which requires identification of specific water bodies where it is expected that WQS will not be met after implementation of technology-based effluent limitations on point sources. Moffett Channel and Guadalupe Slough are not identified as impaired waterbodies; however, South San Francisco Bay is listed as an impaired waterbody for chlordane, DDT, dieldrin, dioxin compounds, exotic species, furan compounds, mercury, PCBs and dioxin-like PCBs, and selenium. The SIP

requires final effluent limitations for all 303(d)-listed pollutants to be consistent with total maximum daily loads (TMDLs) and associated waste load allocations (WLAs).

The Regional Water Board plans to adopt TMDLs for pollutants on the 303(d) list in South San Francisco Bay within the next ten years (a TMDL for mercury became effective on February 12, 2008).

TMDLs will establish WLAs for point sources and load allocations (LAs) for non-point sources, and will be established to achieve the WQS for impaired waterbodies. The discharge of mercury from the Plant is regulated by the Regional Water Board Order No. R2-2007-0077, which implements the mercury TMDL and contains monitoring and reporting requirements.

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

The CWA requires point source dischargers to control the amount of conventional, non-conventional, and toxic pollutants that are discharged into the waters of the United States. The control of pollutants discharged is established through effluent limitations and other requirements in NPDES permits. There are two principal bases for effluent limitations in 40 CFR: section 122.44(a) requires that permits include applicable technology-based limitations and standards; and section 122.44(d) requires that permits include water quality-based effluent limitations (WQBELs) to attain and maintain applicable numeric and narrative WQC to protect the beneficial uses of the receiving water. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established.

Several specific factors affecting the development of limitations and requirements in this Order are discussed as below:

A. Discharge Prohibitions

1. **Discharge Prohibitions III.A (No discharge other than that described in this Order):** This prohibition is the same as in the previous permit and is based on CWC section 13260, which requires filing a Report of Waste Discharge (ROWD) before discharges can occur. Discharges not described in the ROWD, and subsequently in this Order, are prohibited.
2. **Discharge Prohibition III.B (No bypass except as provided for in the conditions stated in Subsections I.G.2 and I.G.4 of Attachment D of this Order):** This prohibition is based on 40 CFR 122.41(m)(4) (see Federal Standard Provisions, section G, Attachment D) and is retained from the previous Order.
3. **Discharge Prohibition III.C (The average dry weather effluent flow shall not exceed 29.5 MGD):** Exceedance of the treatment Plant's average dry weather flow design capacity may result in lowering the reliability of achieving compliance with water quality requirements. This prohibition is meant to ensure effective wastewater treatment by limiting flows to the Plant's design treatment capability. The average dry weather effluent flow is to be determined over three consecutive dry weather months each year and is to include both flows discharged and recycled.
4. **Discharge Prohibition III.D (No sanitary sewer overflows to waters of the United States).** Discharge Prohibition No. 15 from Basin Plan Table 4-1 and the CWA prohibit the

discharge of wastewater to surface waters except as authorized under an NPDES permit. POTWs must achieve secondary treatment, at a minimum, and any more stringent limitations that are necessary to achieve WQS [33 U.S.C. § 1311 (b)(1)(B and C)]. Therefore, a sanitary sewer overflow that results in the discharge of raw sewage, or sewage not meeting secondary treatment requirements, is prohibited under the CWA and the Basin Plan.

B. Exceptions to Basin Plan Prohibitions

1. Basin Plan Discharge Prohibition 1

Discharge prohibition 1 in Table 4-1 of the Basin Plan states that it shall be prohibited to discharge:

- 1. Any wastewater which has particular characteristics of concern to beneficial uses at any point at which the wastewater does not receive a minimum initial dilution of at least 10:1, or into any nontidal water, dead-end slough, similar confined waters, or any immediate tributaries thereof.*

Basin Plan section 4.2 provides for exceptions to this prohibition in the following circumstances:

- An inordinate burden would be placed on the discharger relative to beneficial uses protected and an equivalent level of environmental protection can be achieved by alternate means, such as an alternative discharge site, a higher level of treatment, and/or improved treatment reliability; or
- A discharge is approved as part of a reclamation project; or
- It can be demonstrated that net environmental benefits will be derived as a result of the discharge; or
- A discharge is approved as part of a groundwater clean-up project....

2. History of Granting Exception to Prohibition 1

The treated wastewater discharges from the Sunnyvale, San Jose/Santa Clara, and Palo Alto wastewater treatment plants are discharged to confined waters and do not receive a minimum initial dilution of 10:1. In 1973, these dischargers formed the South Bay Dischargers Authority to jointly consider relocating their outfalls to a location north of the Dumbarton Bridge, but instead, based on studies they conducted between 1981 through 1986, they concluded that their discharges provided a net environmental benefit.

At the same time, the Regional Water Board amended the Basin Plan to establish several new WQOs. Due to the unique hydrodynamic environment of the South Bay, however, the 1986 Basin Plan exempted the South Bay from the new WQOs, instead calling for the development of site-specific objectives (SSOs).

In 1988, the Regional Water Board reissued the Sunnyvale and Palo Alto permits (Order No. 88-176 and Order No. 88-175, respectively), concurring that these discharges provided a net environmental benefit. It therefore granted exceptions to the Basin Plan discharge prohibition

provided that the dischargers would conduct studies addressing salt marsh conversion, development of SSOs and effluent limitations for metals, ammonia removal, and avian botulism control. However, the Regional Water Board concluded that discharges from the San Jose/Santa Clara wastewater treatment plant did not provide a net environmental benefit. Nevertheless, the Regional Water Board found that the discharge could provide a net environmental benefit under specific circumstances, and reissued the NPDES permit (Order No. 89-012) for the San Jose/Santa Clara facility.

Interested parties objected to all three permits and petitioned the State Water Board for review. The State Water Board responded in 1990 through Order No. WQ 90-5. It concluded that all three dischargers had failed to demonstrate a net environmental benefit. Specifically, nutrient loading in South San Francisco Bay was a problem, avian botulism was harming wildlife and estuarine habitat, and metals discharges were potentially contributing to San Francisco Bay impairment.

Through Order No. WQ 90-5, the State Water Board acknowledged that relocation of the discharges north of the Dumbarton Bridge was not economically or environmentally sound. The State Water Board "strongly encouraged" the Regional Water Board and the South Bay Dischargers Authority to pursue wastewater reclamation projects as a means to reduce discharges to San Francisco Bay, and it also concluded that exceptions to the Basin Plan discharge prohibitions could be granted on the basis of "equivalent protection" (i.e., protection equivalent to relocating the discharges to a location north of the Dumbarton Bridge), provided that certain conditions were met. It stated that exceptions could be granted if (a) the discharge permits were to include numeric WQBELs for toxic pollutants, (b) the dischargers (San Jose/Santa Clara and Sunnyvale) were to continue efforts to control avian botulism, and (c) the dischargers (San Jose/Santa Clara in particular) were to properly protect threatened and endangered species. (Attachment I provides a chronological description of the actions taken by the State and Regional Water Boards and the Discharger related to the requirements of Order No. 90-5. The summary also clarifies the origin of some provisions that appear in this Order).

3. Compliance with State Water Board Order No. 90-5

The following is a summary of the Discharger's past and on-going efforts in complying with State Water Board Order No. WQ 90-5, which required (a) numeric WQBELs for toxic pollutants, (b) efforts to control avian botulism, and (c) protection of threatened and endangered species.

- (a) **Toxic Pollutants.** This Order contains WQBELs for toxic pollutants with reasonable potential, including copper, nickel, cyanide, dioxin-TEQ, chlorodibromomethane, endrin, and tributyltin. As shown in Table F-4, the Discharger routinely complied with WQBELs in the previous permit. The Discharger will maintain its current performance and monitoring program for both effluent and receiving water to ensure that conditions will not degrade. As discussed in IV.D, below, compliance with all the WQBELs in this Order is expected to be feasible, with the exception of dioxin-TEQ. This Order requires specific measures to allow the Discharger to come into compliance with new dioxin-TEQ limits.
- (b) **Avian botulism control.** The Discharger has maintained an avian botulism control program by monitoring Moffett Channel, Guadalupe Slough, the vicinity of the oxidation pond, and South San Francisco Bay for the presence of avian botulism since 1982. Annual avian

botulism monitoring reports submitted by both the Discharger and the San Jose/Santa Clara Water Pollution Control Plant indicate that the most recent botulism outbreak in the South Bay occurred in September 2004. Although the South Bay ecosystem is susceptible to avian botulism outbreaks, when considering the constant wastewater discharge from wastewater treatment plants the cause of these episodic outbreaks seems to lie with other environmental factors.

While treatment plant discharge is unlikely to cause botulism outbreaks, monitoring for and removing dead birds to minimize the potential for an outbreak is an appropriate environmental stewardship program to control the severity and extent of the disease. Because waterfowl are a highly mobile group of birds and are most heavily affected by avian botulism, outbreaks could quickly spread throughout the region if no action were taken. For these reasons, continuing the monitoring program and collecting dead and injured birds on Plant property and areas along Moffett Channel and Guadalupe Slough is a worthwhile public endeavor. This Order requires the Discharger to maintain its avian botulism program and continue to conduct avian botulism surveys.

4. Rationale for Continuing to Grant Exception

The following is a summary of the Discharger's past and on-going efforts in meeting the requirements for an exception to Basin Plan Prohibition 1. The Basin Plan allows exceptions when there would otherwise be an inordinate burden placed on a discharger and an equivalent level of protection is possible through such means as providing a higher level of treatment. Likewise, the Basin Plan provides for an exception when a discharge is part of a reclamation project. As discussed below, compliance with Prohibition 1 would place an undue burden on the Discharger, particularly considering the advanced treatment provided, its water recycling efforts, and its pollution prevention and pretreatment programs. The discharge qualifies for exceptions to Prohibition 1.

- (a) **Undue Burden.** For the Discharger to reliably provide at least a 10:1 dilution for its effluent, it would need to construct an outfall far and deep into San Francisco Bay. However, through Order No. WQ 90-5, the State Water Board acknowledged that relocation of the discharge to a location north of the Dumbarton Bridge was not an economically or environmentally sound solution to the concerns associated with the South Bay discharges.
- (b) **Advanced Treatment.** The Discharger provides advanced secondary treatment for all its discharges. In addition to meeting secondary treatment standards, the Plant removes ammonia and provides filtration of the wastewater, which constitutes "advanced" secondary treatment. This Order contains more stringent effluent limits for BOD, TSS, and turbidity than those imposed on plants that provide only secondary treatment. These more stringent effluent limits will ensure that this advanced level of treatment continues.
- (c) **Water Recycling.** The Discharger has invested over \$20 million in a water recycling program that produces and delivers disinfected tertiary recycled water for use in parks, golf courses, commercial landscaping, street medians, and dual plumbed systems in the northern and central sections of the City of Sunnyvale. The system consists of approximately 43,000 feet of 12-inch through 36-inch transmission pipelines, 34,000 feet of 8-inch distribution pipelines, two pump stations, and a 2 million gallon storage tank. In addition, the Discharger updated the Plant's polymer feed, disinfection, dechlorination, and associated control

systems to facilitate production of recycled water and to meet California Department of Public Health Title 22 requirements for water quality and system reliability. During the dry season, approximately 1.2 million gallons are delivered daily to over 100 customers.

- (d) **Pollution Prevention and Pretreatment.** The Discharger continues to implement an aggressive Pollution Prevention and Minimization Program that targets industrial, commercial and residential sectors. The goal of the program is to create awareness of and respect for the watershed in which people live, work, and attend school, and to provide information that leads to opportunities to improve water pollution prevention and water conservation behaviors. The Discharger communicates public outreach messages through several media outlets, including on-screen theater ads, emails, newsletter articles, community cable TV, newspaper ads, door hangers, and utility bill inserts. The Discharger also participates in numerous community and business events throughout the year to promote pollution prevention messages to residents, the general public, youth, and corporate employees. In addition to community events, the Discharger reaches the youth audience through classroom presentations, creek education field trips and treatment plant tours. To leverage resources the Discharger also participates in regional outreach campaigns.

The Discharger's Pretreatment Program staff inspects permitted industrial users and commercial businesses in 15 categories, including dental offices. The Discharger conducted a series of pollution prevention studies in the 1990s in response to Cease and Desist Order No. 93-086, which culminated in a new City Ordinance for industrial dischargers to implement reasonable source control measures, and a reduction in local limits for both copper and nickel. These actions resulted in a permanent reduction in the Plant influent and effluent copper and nickel concentrations, as documented in source identification reports submitted as part of the Discharger's Annual Pretreatment Report.

Because the Discharger has met all the historical requirements of both the State and Regional Water Boards for obtaining an exception to the Basin Plan prohibition, and continues to meet these requirements as discussed above, the Regional Water Board continues to grant an exception to Basin Plan Prohibition 1.

C. Effluent Limitations for Conventional and Non-Conventional Pollutants

1. Scope and Authority of Technology-Based Effluent Limitations

CWA section 301(b) and 40 CFR 122.44 require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable WQS. The discharge authorized by this Order must meet minimum federal technology-based requirements based on Secondary Treatment Standards at 40 CFR 133. These Secondary Treatment Regulations include the following minimum requirements for POTWs.

Table F-8. Secondary Treatment Requirements

Parameters	30-Day Average	7-Day Average
BOD ₅ ⁽¹⁾	30 mg/L	45 mg/L
CBOD ₅ ⁽¹⁾⁽²⁾	25 mg/L	40 mg/L
TSS ⁽¹⁾	30 mg/L	45 mg/L
pH	6.0 – 9.0	

Footnotes for Table F-8:

- (1) The 30-day average percent removal, by concentration, shall not be less than 85 percent.
- (2) At the option of the permitting authority, these effluent limitations for CBOD₅ may be substituted for limitations for BOD₅.

San Francisco Bay south of the Dumbarton Bridge is a unique water body, with a limited capacity to assimilate wastewater. Due to limited circulation, wastewater discharges to this area may take several months to reach the ocean. In addition, the unique wetlands and ambient conditions of South San Francisco Bay sometimes result in natural dissolved oxygen levels that are lower than the Basin Plan's receiving water limit of a minimum of 5.0 mg/L. The limited assimilative capacity of South San Francisco Bay necessitates effluent BOD and TSS limitations that are more restrictive than those required for secondary treatment.

The Discharger constructed advanced secondary wastewater treatment facilities in the late 1970's and has consistently met limits on conventional pollutants that are more stringent than the secondary treatment standards.

2. Applicable Effluent Limitations

This Order retains the following effluent limitations for conventional and non-conventional pollutants, applicable to Discharge Point 001, from the previous Order.

Table F-9. Summary of Effluent Limitations for Conventional and Non-Conventional Pollutants

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
CBOD ₅	mg/L	10	---	20	---	---
TSS	mg/L	20	---	30	---	---
CBOD ₅ and TSS	% Removal	85	---	---	---	---
Oil and Grease	mg/L	5	---	10	---	---
pH	s.u.	---	---	---	6.5	8.5
Total Chlorine Residual	mg/L	---	---	---	---	0.0 ⁽¹⁾
Turbidity	NTU	---	---	---	---	10
Enterococcus Bacteria	Colonies/100 mL	35 ⁽²⁾	---	---	---	---
Ammonia Nitrogen (Jun-Sep)	mg/L as nitrogen	2.0	---	5.0	---	---
Ammonia Nitrogen (Oct-May)	mg/L as nitrogen	18	---	26	---	---

Footnotes for Table F-9:

- (1) The Discharger may elect to use a continuous on-line monitoring system for measuring flow, chlorine, and sulfur dioxide dosage (including a safety factor) and concentration to prove that chlorine residual exceedances are false positives. Convincing evidence must be provided to Regional Water Board staff to conclude these false positive exceedances are not violations of this permit.

- (2) Expressed as a 30-day geometric mean.

This Order does not retain the previous Order's technology-based effluent limitations for settleable matter because Basin Plan Table 4-2 no longer requires them for POTWs.

- a. **CBOD₅ and TSS.** The effluent limitations for CBOD₅ and TSS, including the 85 percent removal requirement are unchanged from the previous Order. These limitations are technologically feasible for advanced wastewater treatment technologies. 40 CFR 122.45(d) specifies that discharge limitations for POTWs shall be stated as average weekly limitations and average monthly limitations, unless impracticable. Expressing effluent limitations for CBOD₅ and TSS as maximum daily limitations instead of average weekly limitations effectively results in more stringent limits, as effluent variability is not averaged out over a period of a week. Self-monitoring data show the Discharger has been able to consistently comply with these CBOD₅ and TSS effluent limits.
- b. **Oil and Grease.** The effluent limitations for oil and grease are technology-based and are unchanged from the previous Order. These limitations are based on Basin Plan Table 4-2 for shallow water dischargers. Self-monitoring data show the Discharger has been able to consistently comply with these oil and grease effluent limits.
- c. **pH.** The effluent limitations for pH are water quality-based and are unchanged from the previous Order. These limitations are based on Basin Plan Table 4-2 for shallow water dischargers. Self-monitoring data show the Discharger has been able to consistently comply with these pH effluent limits.
- d. **Total chlorine residual.** The effluent limitation for total chlorine residual is based on water quality and on Basin Plan Table 4-2. It is unchanged from the previous Order. The Discharger may use a continuous on-line monitoring system to measure flow, chlorine, and sodium bisulfite concentration and dosage to prove that chlorine residual exceedances are false positives. If convincing evidence is provided, Regional Water Board staff may conclude that these false positives of chlorine residual exceedances are not violations of the limitation. Self-monitoring effluent data show the Discharger can comply with this effluent limit.
- e. **Turbidity.** The effluent limitation for turbidity is unchanged from the previous Order and is representative of adequate and reliable advanced-secondary level wastewater treatment. This limitation is technologically feasible for advanced secondary wastewater treatment technologies. Self-monitoring data show the Discharger has been able to consistently comply with this turbidity effluent limit.
- f. **Enterococcus bacteria.** The 30-day geometric mean effluent limitation for enterococcus bacteria is unchanged from the previous Order; however, the single sample maximum limit of 276 colonies per 100 mL is not retained to be consistent with other recently adopted NPDES permits and USEPA criteria. Basin Plan Table 3-2 cites the 30-day geometric mean enterococcus bacteria limit, which is based on the USEPA criteria at 40 CFR 131.41 for coastal recreational waters, including costal estuaries, in California.

These water quality criteria became effective on December 16, 2004 [69 Fed. Register 67218 (November 16, 2006)].

Although USEPA also established single sample maximum criteria for enterococci bacteria, this Order implements only the geometric mean criterion of 35 colonies per 100 milliliters as an effluent limitation. When these water quality criteria were promulgated, USEPA expected that the single sample maximum values would be used for making beach notification and beach closure decisions. "Other than in the beach notification and closure decision context, the geometric mean is the more relevant value for assuring that appropriate actions are taken to protect and improve water quality because it is a more reliable measure, being less subject to random variation ..." [69 Fed Reg. 67224 (November 16, 2004)].

The removal of the daily maximum bacteria limit is consistent with the exception to the Clean Water Act's backsliding provisions, expressed at CWA 402(o)(2)(B)(ii) for technical mistakes.

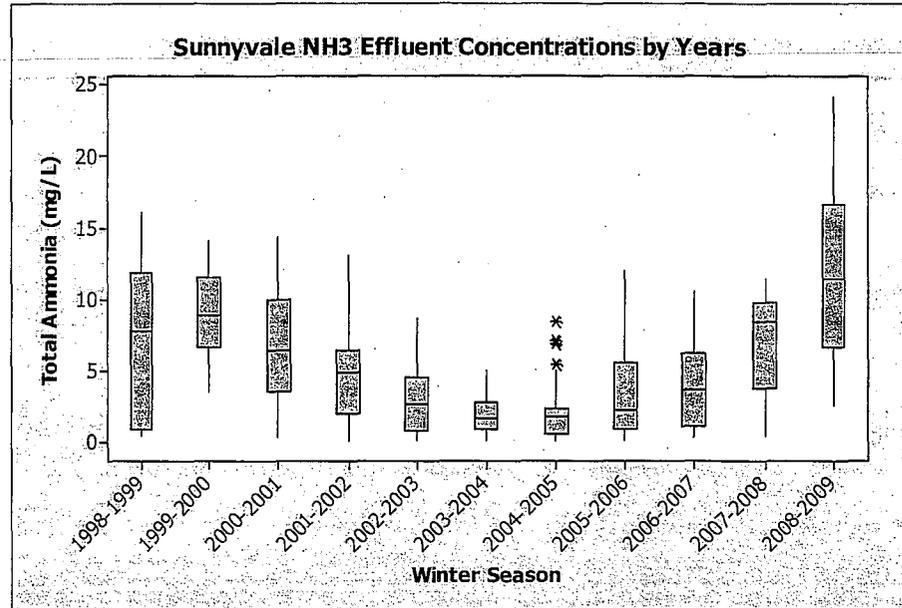
The Discharger has previously conducted a study, from June 2003 to December 2004, and submitted results in a final report, *City of Sunnyvale Water Pollution Control Plant Receiving Water User Survey Confirmation Study*, dated December 23, 2004, demonstrating that the "lightly used" water contact category is conservative for both Moffett Channel and Guadalupe Slough. Therefore effluent limitations for enterococcus bacteria are protective of water contact beneficial uses of the receiving water.

Self-monitoring data show the Discharger has been able to consistently comply with this enterococcus 30-day geometric mean effluent limit.

Although South San Francisco Bay is listed to support shellfish harvesting, as explained under Section III.C.1, shellfish harvesting does not exist in the South San Francisco Bay south of Foster City, nor does it exist near the vicinity of the discharge outfall. Therefore, this Order does not establish fecal coliform effluent limits for protecting shellfish harvesting.

- g. **Total Ammonia.** The effluent limits during June through September are retained from the previous Order. In addition, this Order includes new performance-based ammonia effluent limits for colder weather months, October through May. The new performance-based effluent limits are intended to ensure that the Discharger maintains its Plant's existing ammonia removal performance and that current ammonia conditions are maintained in the receiving water. Effluent monitoring data from 1998 through 2009 during the winter months (November through March) indicate that ammonia effluent concentrations vary from year to year. There were years that ammonia effluent concentrations showed a decreasing trend, but there were times that ammonia effluent concentrations showed an increasing trend. The box plot below illustrates the general trend of ammonia effluent concentrations during the winter seasons of 1998 through 2009. Average total ammonia concentrations during these winter seasons were 7.0, 8.9, 6.7, 4.6, 2.9, 1.8, 2.0, 3.3, 3.8, 6.7, and 11.6 mg/L for 1998-1999, 1999-2000, 2000-2001, 2001-2002, 2002-2003, 2003-2004, 2004-2005, 2005-2006, 2006-2007, 2007-2008, and

2008-2009, respectively. Effluent limits are necessary to prevent Plant performance from deteriorating as seen in recent years.



How to read a box plot: The box plot has a box, with two whiskers extending upward and downward of the box, and stars beyond the whiskers. The bottom of the box is the first quartile (Q1, or 25% of the data values are less than or equal to this value) and the top box is the third quartile (Q3) – 75% of the data values are less than or equal to this value. The upper whisker extends to the highest data value within the upper limit (upper limit = $Q3 + 1.5(Q3 - Q1)$); the lower whisker extends to the lowest value within the lower limit (lower limit = $Q1 + 1.5(Q3 - Q1)$). The stars are unusually large or small observations. Values beyond the whiskers are considered outliers. The line in the middle of the box is the median of the data, which half of the observations are less than or equal to. The little circle inside the box is the mean value.

The new winter performance-based effluent limits are based on cold-weather (October through May) Plant performance from November 2003 through March 2009. The daily maximum effluent concentrations and monthly average concentrations for those months fit a lognormal distribution after data transformation (the 0.3 root of daily maximum concentrations and the square root of monthly average concentrations were taken). The 99.87th percentile (three standard deviations above the mean) of the maximum daily concentrations is 26 mg/L; this value is established as the daily maximum effluent limit. The 99th percentile of the monthly average concentrations is 18 mg/L; this value is established as the monthly average effluent limit. The maximum daily effluent concentration during October through May of 2003-2009 ranged from <0.08 mg/L to 24.1 mg/L. Monthly average concentrations during this period ranged from 0.1 mg/L to 17.4 mg/L. Therefore, the Discharger is expected to be able to comply with these new effluent limits.

D. WQBELs

WQBELs have been derived to implement WQOs that protect beneficial uses. Both the beneficial uses and the WQOs have been approved pursuant to federal law. The procedures for calculating individual WQBELs are based on the SIP, which was approved by the USEPA prior to May 1, 2001, or Basin Plan provisions approved by the USEPA on May 29, 2000. Most beneficial uses and WQOs contained in the Basin Plan were approved under state law and submitted to and approved by the USEPA prior to May 30, 2000. Any WQOs and beneficial uses submitted to the USEPA prior to May 30, 2000, but not approved by the USEPA before that date, are nonetheless "applicable water quality standards for purposes of the [Clean Water] Act" pursuant to 40 CFR 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than the applicable WQS for purposes of the CWA.

1. Scope and Authority

- a. 40 CFR 122.44(d)(1)(i) mandates that permits include effluent limitations for all pollutants that are or may be discharged at levels that have the reasonable potential to cause or contribute to an exceedance of a WQS, including numeric and narrative objectives within a standard. As specified in 40 CFR 122.44(d)(1)(i), permits are required to include WQBELs for all pollutants "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 State water quality standard." Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, WQBELs must be established using (1) USEPA criteria guidance under CWA section 304(a), supplemented where necessary by other relevant information; (2) an indicator parameter for the pollutant of concern; or (3) a calculated numeric WQC, such as a proposed state criterion or policy interpreting the state's narrative criterion, supplemented with other relevant information, as provided in section 122.44(d)(1)(vi).

The process for determining "reasonable potential" and calculating WQBELs when necessary is intended to protect the designated uses of the receiving water as specified in the Basin Plan, and achieve applicable WQOs/WQC that are contained in other State plans and policies, and applicable WQC contained in the CTR and NTR.

- b. NPDES regulations and the SIP provide the basis to establish maximum daily effluent limitations (MDELs).
 - (1) **NPDES Regulations.** NPDES regulations at 40 CFR 122.45(d) state: "For continuous discharges all permit effluent limitations, standards, and prohibitions, including those necessary to achieve water quality standards, shall *unless impracticable* be stated as maximum daily and average monthly discharge limitations for all discharges other than publicly owned treatment works."
 - (2) **SIP.** The SIP (Section 1.4) requires WQBELs to be expressed as MDELs and average monthly effluent limitations (AMELs).
- c. MDELs are used in this Order to protect against acute water quality effects. The MDELs are necessary for preventing fish kills or mortality to aquatic organisms.

2. Applicable Beneficial Uses and WQC

The WQC applicable to the receiving waters for this discharge are from the Basin Plan; the CTR, established by USEPA at 40 CFR 131.38; and the NTR, established by USEPA at 40 CFR 131.36. Some pollutants have WQC established by more than one of these three sources.

- a. **Basin Plan.** The Basin Plan specifies numeric WQOs for 10 priority toxic pollutants, for all marine and freshwaters *except for* South San Francisco Bay, south of Dumbarton Bridge. For this portion of South Bay, the CTR WQC apply, except SSOs have been adopted for copper and nickel for marine and estuarine waters of South San Francisco Bay, south of Dumbarton Bridge. Site-specific objectives for cyanide have been adopted for all segments of San Francisco Bay.
- b. **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, including South San Francisco Bay south of the Dumbarton Bridge.
- c. **NTR.** The NTR establishes numeric aquatic life criteria for selenium and numeric human health criteria for 33 toxic organic pollutants for waters of San Francisco Bay upstream to, and including Suisun Bay and the Delta. These NTR WQC are applicable to South San Francisco Bay.
- d. **Narrative Objectives for Water Quality-Based Toxics Controls.** Where numeric objectives have not been established or updated in the Basin Plan, NPDES regulations at 40 CFR 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 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 SIP.

- e. **Basin Plan Receiving Water Salinity Policy.** The Basin Plan and CTR state that the salinity characteristics (i.e., freshwater versus saltwater) of the receiving water shall be considered in determining the applicable WQOs. Freshwater criteria shall apply to discharges to waters with salinities equal to or less than 1 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 waters with salinities in between these two categories, or tidally influenced fresh waters that support estuarine beneficial uses, the WQOs shall be the lower of the salt- or freshwater criteria (the freshwater criteria for some metals are calculated based on ambient hardness) for each substance.