

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

SAN FRANCISCO BAY REGION

SELF-MONITORING PROGRAM

FOR

MARIN MUNICIPAL WATER DISTRICT

DESALINATION PILOT PLANT

SAN RAFAEL, MARIN COUNTY

NPDES PERMIT NO. CA0038814

ORDER NO. R2-2005-0XXX

Consists of:

Part A, Adopted August 1993

(Not attached)

And

Part B, Effective March 17 , 2005

(Attached)

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I. Station Descriptions

<u>Station</u>	<u>Description</u>
INFLUENT	
A-001	At any point in the Marin Municipal Water District Desalination Pilot Plant's (the Pilot Plant) Seawater Holding tank at which all source water is present, and prior to any phase of treatment.
EFFLUENT	
E-001	At any point in the reverse osmosis concentrate (brine) pipelines, after the reverse osmosis desalination process, and prior to blending with the return waters.
E-001-D	At any point in the discharge pipe after the Pilot Plant's Return Water Pump at which all effluent tributary to that discharge pipe is present, and where adequate dechlorination is assured.

II. Schedule Of Sampling, Analyses And Observations

The schedule of sampling and analysis shall be that given in Table 1, below. Sampling and analysis of additional constituents is required pursuant to the Water Board's August 6, 2001 Letter titled *Requirement for Monitoring of Pollutants in Effluent and Receiving Water to Implement New Statewide Regulations and Policy*. This additional pollutant monitoring of the brine shall be carried out twice annually until the Discharger's application for reissuance of this NPDES permit.

Table 1. Schedule Of Sampling and Analyses.

SAMPLING STATION		A-001		E-001		E-001-D	
TYPE OF SAMPLE	Notes	G	C-24 [1]	G	C-24 [1]	G	C-24 [1]
Temperature (°F)		5/W					
Flow Rate (mgd)	[2]		Cont.				Cont.
Conductivity (µmhos/cm)		2/M		2/M			
Total Suspended Solids (mg/L)			2/M		2/M		2/M
Total Dissolved Solids (mg/L)		2/M			2/M	2/M	
pH (standard units)	[3]	5/W				5/W	
Total Chlorine Residual (mg/L)	[4]					Cont. or hourly	
Acute Toxicity (% survival)	[5]				2/Y	M	

LEGEND FOR TABLE 1

Types of Samples:

C-24= composite sample, 24-hour (includes continuous sampling, such as for flows)

Cont.= continuous sampling

G= grab sample

Frequency of Sampling:

Parameter and Unit Abbreviations

Cont. = continuous monitoring
M = once each month
2/M = twice each month
5/W = five days per week

TSS = Total Suspended Solids
mgd = million gallons per day
g/L = grams per liter
mg/L = milligrams per liter
(µmhos/cm) = micromhos per centimeter

FOOTNOTES FOR TABLE 1

- [1] Composite sampling: 24-hour composites may be made with up of discrete grabs collected over the course of a day and volumetrically or mathematically flow-weighted. Samples for inorganic pollutants may be combined prior to analysis. If only one grab sample will be collected, it should be collected during periods of maximum peak flows. Samples shall be taken on random days.
- [2] Flow Monitoring: Effluent flows shall be measured continuously at Outfalls A-001 and E-001, and recorded and reported daily
- [3] Daily minimum and maximum for pH shall be reported.
- [4] Chlorine Residual Monitoring: During all times when chlorination is used for disinfection of the effluent, effluent chlorine residual concentrations shall be monitored continuously, or by grab samples taken hourly. Chlorine residual concentrations shall be monitored and reported for sampling points both prior to and following dechlorination. Total chlorine dosage (mg/l & kg/day) shall be recorded on a daily basis.
- [5] Acute Toxicity:
E-001: Reverse osmosis concentrate (brine) shall be combined with wastewater effluent from the Central Marin Sanitation Agency at various concentrations to evaluate toxicity.

E-001-D: 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, ammonia nitrogen, and temperature. These results shall be reported. If a violation of acute toxicity requirements occurs, a new bioassay test shall be started as soon as practicable and testing should continue back to back until compliance is demonstrated.

III. Recording Requirements

- A. General Recording Requirements are described in Section E of Part A of the Self-Monitoring Program.
- B. Any overflow without adequate treatment discharged into the receiving water, or significant non-compliance incident shall be recorded according to Sections E.1. and E.2. of Part A.

IV. Reporting Requirements

- A. General Reporting Requirements are described in Section E of the Board's *Standard Provisions and Reporting Requirements for NPDES Surface Water Discharge Permits*, dated August 1993, and Part A of the Self-Monitoring Program.
- B. Modifications to Self-Monitoring Program, Part A:
1. If any discrepancies exist between Part A and Part B of the SMP, Part B prevails.
 2. Modify Section F.1 as follows:

Spill Reports

A report shall be made of any spill of oil or other hazardous material. The spill shall be reported by telephone as soon as possible and no later than 24 hours following occurrence or discharger's knowledge of occurrence. Spills shall be reported by telephone as follows:

During weekdays, during office hours of 8 am to 5 pm, to the Board: Current telephone number: (510) 622 - 2300, (510) 622-2460 (FAX).

During non-office hours, to the State Office of Emergency Services: Current telephone number: (800) 852 - 7550.

A report shall be submitted to the Board within five (5) working days following telephone notification, unless directed otherwise by Board staff. A report submitted by facsimile transmission is acceptable for this reporting.

3. Modify Section F.4 as follows:

Self-Monitoring Reports

For each calendar month, a self-monitoring report (SMR) shall be submitted to the Board in accordance with the requirements listed in Self-Monitoring Program, Part A. The purpose of the report is to document treatment performance, effluent quality and compliance with waste discharge requirements prescribed by this Order, as demonstrated by the monitoring program data and the Discharger's operation practices. The report shall be submitted to the Board by the first day of the second month after the month being reported on.

4. Add at the end of Section F.5, Annual Reporting, the following:

- d. A plan view drawing or map showing the Dischargers' facility, flow routing and sampling and observation station locations.
5. The Discharger is not subject to the requirements of Sections C.3 Storm Water, C.4 Receiving Waters, C.5 Bottom Sediment Samples and Sampling and Reporting Guidelines, D.2 Wastewater Effluent, D.3 Beach and Shoreline, D.4 Land Retention and Disposal Area, and D.5 Periphery of Waste Treatment and/or Disposal Facilities, of Part A of the SMP, which are not applicable to the Discharger's operation.

V. Self-Monitoring Program Certification

I, Bruce H. Wolfe, Executive Officer, hereby certify that the foregoing Self-Monitoring Program:

1. Has been developed in accordance with the procedure set forth in this Board's Resolution No. 73-16 in order to obtain data and document compliance with waste discharge requirements established in Board Order No. R2-2005-XXXX.
 2. May be reviewed at any time subsequent to the effective date upon written notice from the Executive Officer or request from the Discharger, and revisions will be ordered by the Executive Officer.
 3. Is effective as of March 17, 2005.
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Bruce H. Wolfe,
Executive Officer

Enclosure:

Chronic Toxicity – Definition of Terms and Screening Phase Requirements

CHRONIC TOXICITY
DEFINITION OF TERMS & SCREENING PHASE REQUIREMENTS

I. Definition of Terms

- A. No observed effect level (NOEL) for compliance determination is equal to IC₂₅ or EC₂₅. If the IC₂₅ or EC₂₅ 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. EC₂₅ is the concentration of toxicant (in percent effluent) that causes a response in 25% 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 non-lethal, non-quantal biological measurement, such as growth. For example, an IC₂₅ is the estimated concentration of toxicant that would cause a 25% reduction in average young per female or growth. IC values may be calculated using a linear interpolation method such as EPA'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 pretreatment, source control, and waste minimization efforts, or
 2. Prior to Permit issuance. Screening phase monitoring data shall be included in the NPDES Permit application for issuance. The information shall be as recent as possible.
- B. Design of the screening phase shall, at a minimum, consist of the following elements:
1. Use of test species specified in Tables 1 and 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 Table 1 (attached); and
 - 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; and
 4. Concurrent reference toxicant tests.
- C. The discharger shall submit a screening phase proposal to the Executive Officer for approval. The proposal shall address each of the elements listed above.

TABLE C 1
CRITICAL LIFE STAGE TOXICITY TESTS FOR ESTUARINE WATERS

SPECIES	SCIENTIFIC NAME	EFFECT	TEST DURATION	REFER- ENCE
alga	(<u>Skeletonema costatum</u>)	growth rate	4 days	1
	(<u>Thalassiosira pseudonana</u>)	growth rate		
red alga	(<u>Champia parvula</u>)	number of cystocarps	7-9 days	3
giant kelp	(<u>Macrocystis pyrifera</u>)	percent germination; germ tube length	48 hours	2
abalone	(<u>Haliotis rufescens</u>)	abnormal shell development	48 hours	2
oyster	(<u>Crassostrea gigas</u>)	abnormal shell development;	48 hours	2
mussel	(<u>Mytilus edulis</u>)	percent survival		2
echinoderms		percent fertilization	1 hour	2
urchins	(<u>Strongylocentrotus purpuratus</u> , <u>S. franciscanus</u>)	percent fertilization	1 hour	2
sand dollar	(<u>Dendraster excentricus</u>)	percent fertilization	1 hour	2
shrimp	(<u>Mysidopsis bahia</u>)	percent survival; growth; fecundity	7 days	3
silversides	(<u>Menidia beryllina</u>)	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. USEPA\600\R-95\136. 1995.
3. Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Marine and Estuarine Organisms as specified in 40CFR 136. Currently, this is USEPA/600/4-90/003, July 1994. Later editions may replace this version.

TABLE C 2
CRITICAL LIFE STAGE TOXICITY TESTS FOR FRESH WATERS

SPECIES REFERENCE	(Scientific name)	EFFECT	TEST DURATION	
fathead minnow	(<u>Pimephales promelas</u>)	survival; growth rate	7 days	6
water flea	(<u>Ceriodaphnia dubia</u>)	survival; number of young	7 days	6
alga	(<u>Selenastrum capricornutum</u>)	cell division rate	4 days	6

Toxicity Test Reference:

6. Horning, W.B. and C.I. Weber (eds.). 1989. Short-term methods for estimating the chronic toxicity of effluents and receiving waters to freshwater organisms. Second edition. U.S. EPA Environmental Monitoring Systems Laboratory, Cincinnati, Ohio. EPA/600/4-89/001.
