CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD

CENTRAL VALLEY REGION

11020 Sun Center Drive #200, Rancho Cordova, California 95670-6114
Phone (916) 464-3291 • FAX (916) 464-4645
http://www.waterboards.ca.gov/centralvalley

ORDER NO. R5-2008-XXXX
NPDES NO. CA0082309

WASTE DISCHARGE REQUIREMENTS FOR THE
GWF POWER SYSTEMS, L.P.
WILBUR AVENUE EAST POWER PLANT ANTIOCH (SITE IV)
CONTRA COSTA COUNTY

The following Discharger is subject to waste discharge requirements as set forth in this Order:

Table 1. Discharger Information

Discharger	GWF Power Systems, L.P.
Name of Facility	Wilbur Avenue East Power Plant Antioch (Site IV)
Facility Address	3400 Wilbur Avenue
	Antioch, CA 94509
	Contra Costa
The U.S. Environmental Protection Agency (USEPA) and the Regional Water Quality Control Board have classified this discharge as a **minor** discharge.	

The discharge by the Owner from the discharge point identified below is subject to waste discharge requirements as set forth in this Order:

Table 2. Discharge Location

Discharge Point	Effluent Description	Discharge Point Latitude	Discharge Point Longitude	Receiving Water
001	Cooling tower blowdown water	38°01'12" N	121°45'26" W	San Joaquin River

Table 3. Administrative Information

This Order was adopted by the Regional Water Quality Control Board on:	**<Adoption Date>**
This Order shall become effective on:	**<Effective Date>**
This Order shall expire on:	**<Expiration Date>**
The Discharger shall file a Report of Waste Discharge in accordance with title 23, California Code of Regulations, as application for issuance of new waste discharge requirements no later than:	**<u>180 days prior to the Order expiration date</u>**

IT IS HEREBY ORDERED, that Order No. R5-2002-0155 is rescinded upon the effective date of this Order except for enforcement purposes, and, in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations adopted thereunder, and the provisions of the federal Clean Water Act (CWA) and regulations and guidelines adopted thereunder, the Discharger shall comply with the requirements in this Order.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify that this Order with all attachments is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on **<Adoption Date>**.

_____

PAMELA C. CREEDON, Executive Officer

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I. FACILITY INFORMATION

The following Discharger is subject to waste discharge requirements as set forth in this Order:

Table 4. Facility Information

Discharger	GWF Power Systems, L.P.
Name of Facility	Wilbur Avenue East Power Plant Antioch (Site IV)
Facility Address	3400 Wilbur Avenue
	Antioch, CA 94509
	Contra Costa
Facility Contact, Title, and Phone	Mark Kehoe, Director, Environmental Health and Safety (925) 431-1440
Mailing Address	4300 Railroad Avenue, Pittsburgh, CA 94565
Type of Facility	Industrial Power Generation Facility
Facility Design Flow	0.125 mgd

II. FINDINGS

The California Regional Water Quality Control Board, Central Valley Region (hereinafter Regional Water Board), finds:

A. Background. GWF Power Systems, L.P. (hereinafter Discharger) is currently discharging pursuant to Order No. R5-2002-0155 and National Pollutant Discharge Elimination System (NPDES) Permit No. CA 0082309. The Discharger submitted a Report of Waste Discharge, dated 15 January 2007**,** and applied for a NPDES permit renewal to discharge up to 0.125 mgd of cooling tower blowdown from the Wilbur Avenue East Power Plant Antioch (Site IV)**,** hereinafter Facility. The application was deemed complete.

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. Facility Description. The Discharger owns and operates a steam electric power generation facility that generates up to 19.2 megawatts of net electrical power from the burning of petroleum coke as its primary fuel. The fluid bed combustor industrial boiler is started on natural gas and number 2 fuel oil. Water is used for the production of steam and also for cooling using cooling towers. The City of Antioch municipal water supply is used for make-up water to the cooling tower along with boiler blowdown, gland steam condensate, auxiliary cooling system water, reverse osmosis (RO) reject water, and clean water from the oil water separator which collects water from equipment cleaning activities and storm water secondary containment structures. Municipal water is also the supply source for the RO demineralizer system boiler water make up. The cooling towers are maintained between 6 and 8 cycles controlled by blowdown that becomes

the Effluent. The Effluent is treated to reduce metals in the discharge. The treatment system consists of a membrane filter for solids removal followed by activated carbon and/or ion exchange resin or equivalent media to remove metals. Wastewater is discharged from Discharge Point 001 (see table on cover page) to the San Joaquin River, a water of the United States, within the Sacramento-San Joaquin Delta. Attachment B provides a map of the area around the Facility. Attachment C provides a flow schematic of the Facility and the treatment system.

C. Legal Authorities. This Order is issued pursuant to section 402 of the federal Clean Water Act (CWA) and implementing regulations adopted by the U.S. Environmental Protection Agency (USEPA) and chapter 5.5, division 7 of the California 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 Waste Discharge Requirements (WDRs) pursuant to article 4, chapter 4, Division 7 of the Water Code (commencing with section 13260).

D. Background and Rationale for Requirements. The Regional Water Board developed the requirements in this Order based on information submitted as part of the application, through monitoring and reporting programs, and other available information. The Fact Sheet (Attachment F), which contains background information and rationale for Order requirements, is hereby incorporated into this Order and constitutes part of the Findings for this Order. Attachments A through E and G are also incorporated into this Order.

E. California Environmental Quality Act (CEQA). Under Water Code section 13389, this action to adopt an NPDES permit is exempt from the provisions of CEQA, Public Resources Code sections 21100-21177.

F. Technology-based Effluent Limitations*.* Section 301(b) of the CWA and implementing USEPA permit regulations at section 122.44, title 40 of the Code of Federal Regulations (CFR)[1] require that permits include conditions meeting applicable technology-based requirements at a minimum, and any more stringent effluent limitations necessary to meet applicable water quality standards. The discharge authorized by this Order must meet minimum federal technology-based requirements for steam electric power generating facilities based on Effluent Limitations Guidelines and Standards for Steam Electric Power Generating Facilities at 40CFR Section 423. A detailed discussion of the technology-based effluent limitations development is included in the Fact Sheet (Attachment F).

G. Water Quality-based Effluent Limitations. Section 301(b) of the CWA and section 122.44(d) require that permits include limitations more stringent than applicable federal technology-based requirements where necessary to achieve applicable water quality standards. Section 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 water quality standard, including numeric

[1] All further statutory references are to title 40 of the Code of Federal Regulations unless otherwise indicated.

and narrative objectives within a standard. Where reasonable potential has been established for a pollutant, but there is no numeric criterion or objective for the pollutant, water quality-based effluent limitations (WQBELs) must be established using: (1) EPA 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 water quality criterion, such as a proposed State criterion or policy interpreting the State's narrative criterion, supplemented with other relevant information, as provided in 40 CFR section 122.44(d)(1)(vi).

H. Water Quality Control Plans. The Regional Water Board adopted a *Water Quality Control Plan, Fourth Edition (Revised August 2006), for the Sacramento and San Joaquin River Basins* (hereinafter Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. In addition, the Basin Plan implements State Water Resources Control Board (State Water Board) Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Beneficial uses applicable to the San Joaquin River are as follows: municipal and domestic supply; agricultural supply, including stock watering; industrial service supply; industrial process supply; navigation; water contact recreation, non-contact water recreation, including aesthetic enjoyment; commercial and sport fishing; aquaculture; warm freshwater habitat; cold freshwater habitat; warm migration of aquatic organisms; cold migration of aquatic organisms; warm spawning, reproduction, and/or early development; and wildlife habitat.

In addition, the Basin Plan implements State Water Resources Control Board (State Water Board) Resolution No. 88-63, which established state policy that all waters, with certain exceptions, should be considered suitable or potentially suitable for municipal or domestic supply. Thus, as discussed in detail in the Fact Sheet, beneficial uses applicable to the San Joaquin River are as follows:

Table 5. Basin Plan Beneficial Uses

Discharge Point	Receiving Water Name	Beneficial Use(s)
001	**San Joaquin River**	Existing: Warm freshwater habitat (WARM); Cold freshwater habitat (COLD); Agricultural supply (AGR); Wildlife habitat (WILD), Municipal and domestic water supply (MUN), Navigation (NAV); Industrial service supply (IND); Industrial process supply (PROC); Contact (REC-1) and Non-contact (REC-2) water recreation.

The Basin Plan includes a list of Water Quality Limited Segments (WQLSs), which are defined as "…those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources (40 CFR 130, et seq.)." The Basin Plan also states, "Additional treatment beyond minimum federal standards

will be imposed on dischargers to WQLSs. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment." The Delta Waterways Central Portion, which includes the San Joaquin River near Antioch, is listed as a WQLS for chlorpyrifos, DDT, diazinon, exotic species, Group A pesticides, mercury and unknown toxicity in the 303(d) list of impaired water bodies. None of these constituents are present in the effluent based on the Report of Waste Discharge.

The State Water Board adopted a *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California* (Thermal Plan) on May 18, 1972, and amended this plan on September 18, 1975. This plan contains temperature objectives for surface waters. Requirements of this Order implement the Thermal Plan.

Requirements of this Order specifically implement the applicable Water Quality Control Plans.

I. **National Toxics Rule (NTR) and California Toxics Rule (CTR).** USEPA adopted the NTR on December 22, 1992, and later 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 for priority pollutants.

J. **State Implementation Policy.** 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.

K. **Compliance Schedules and Interim Requirements.** In general, an NPDES permit must include final effluent limitations that are consistent with Clean Water Act section 301 and with 40 CFR 122.44(d). There are exceptions to this general rule. The State Water Board has concluded that where the Regional Water Board's Basin Plan allows for schedules of compliance and the Regional Water Board is newly interpreting a narrative standard, it may include schedules of compliance in the permit to meet effluent limits that implement a narrative standard. See In the Matter of Waste Discharge Requirements for Avon Refinery (State Board Order WQ 2001-06 at pp. 53-55). See also Communities for a Better Environment et al. v. State Water Resources Control Board, 34 Cal.Rptr.3d 396, 410 (2005). The Basin Plan for the Sacramento and San

Joaquin Rivers includes a provision that authorizes the use of compliance schedules in NPDES permits for water quality objectives that are adopted after the date of adoption of the Basin Plan, which was September 25, 1995 (See Basin Plan at page IV-16). Consistent with the State Water Board's Order in the CBE matter, the Regional Water Board has the discretion to include compliance schedules in NPDES permits when it is including an effluent limitation that is a "new interpretation" of a narrative water quality objective. This conclusion is also consistent with the United States Environmental Protection Agency policies and administrative decisions. See, e.g., Whole Effluent Toxicity (WET) Control Policy. The Regional Water Board, however, is not required to include a schedule of compliance, but may issue a Time Schedule Order pursuant to Water Code section 13300 or a Cease and Desist Order pursuant to Water Code section 13301 where it finds that the discharger is violating or threatening to violate the permit. The Regional Water Board will consider the merits of each case in determining whether it is appropriate to include a compliance schedule in a permit, and, consistent with the Basin Plan, should consider feasibility of achieving compliance, and must impose a schedule that is as short as practicable to achieve compliance with the objectives, criteria, or effluent limit based on the objective or criteria.

For CTR constituents, Section 2.1 of the SIP provides that, based on a Discharger's request and demonstration that it is infeasible for an existing Discharger to achieve immediate compliance with an effluent limitation derived from a CTR criterion, compliance schedules may be allowed in an NPDES permit. Unless an exception has been granted under section 5.3 of the SIP, a compliance schedule may not exceed 5 years from the date that the permit is issued or reissued, nor may it extend beyond 10 years from the effective date of the SIP (or May 18, 2010) to establish and comply with CTR criterion-based effluent limitations. Where a compliance schedule for a final effluent limitation that exceeds 1 year, the Order must include interim numeric limitations for that constituent or parameter. Where allowed by the Basin Plan, compliance schedules and interim effluent limitations or discharge specifications may also be granted to allow time to implement a new or revised water quality objective.

L. 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. (40 C.F.R. § 131.21; 65 Fed. Reg. 24641 (April 27, 2000).) 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.

M. Stringency of Requirements for Individual Pollutants. This Order contains both technology-based and water quality-based effluent limitations for individual pollutants. The technology-based limitations consist of restrictions on free available chlorine, oil and grease, priority pollutants, zinc, chromium, and TSS. The water quality-based effluent limitations consist of restrictions on aluminum, copper, barium, chloride, cyanide, electrical conductivity, fluoride, iron, molybdenum, selenium, sulfate, total dissolved solids, dibromochloromethane, nitrate, pH, and acute toxicity. This Order's

technology-based pollutant restrictions implement the minimum, applicable federal technology-based requirements.

Water quality-based effluent limitations have been scientifically derived to implement water quality objectives that protect beneficial uses. Both the beneficial uses and the water quality objectives have been approved pursuant to federal law and are the applicable federal water quality standards. To the extent that toxic pollutant water quality-based effluent limitations were derived from the CTR, the CTR is the applicable standard pursuant to 40 CFR section 131.38. The scientific procedures for calculating the individual water quality-based effluent limitations are based on the CTR-SIP, which was approved by USEPA on May 1, 2001. All beneficial uses and water quality objectives contained in the Basin Plan were approved under state law and submitted to and approved by USEPA prior to May 30, 2000. Any water quality objectives and beneficial uses submitted to USEPA prior to May 30, 2000, but not approved by USEPA before that date, are nonetheless "*applicable water quality standards for purposes of the [Clean Water] Act*" pursuant to 40 CFR section 131.21(c)(1). Collectively, this Order's restrictions on individual pollutants are no more stringent than required to implement the technology-based requirements of the CWA and the applicable water quality standards for purposes of the CWA.

N. Antidegradation Policy. Section 131.12 requires that the state water quality standards 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 is consistent with the federal antidegradation policy where the federal policy applies under federal law. Resolution No. 68-16 requires that existing quality of waters 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. As discussed in detail in the Fact Sheet the permitted discharge is consistent with the antidegradation provision of section 131.12 and State Water Board Resolution No. 68-16.

N. Anti-Backsliding Requirements. Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at title 40, Code of Federal Regulations section 122.44(l) prohibit backsliding in NPDES permits. These anti-backsliding provisions require effluent limitations in a reissued permit to be as stringent as those in the previous permit, with some exceptions where limitations may be relaxed. As discussed in detail in the Fact Sheet, the permitted discharge is consistent with the Anti-backsliding requirements.

P. Monitoring and Reporting. Section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorizes the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program establishes monitoring and reporting requirements to implement federal and State requirements. This Monitoring and Reporting Program is provided in Attachment E.

Q. Standard and Special Provisions. Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to

specified categories of permits in accordance with section 122.42, are provided in Attachment D. The discharger must comply with all standard provisions and with those additional conditions that are applicable under section 122.42. The Regional Water Board has also included in this Order special provisions applicable to the Discharger. A rationale for the special provisions contained in this Order is provided in the attached Fact Sheet.

R. Provisions and Requirements Implementing State Law. The provisions/requirements in subsections IV.C of this Order are included to implement state law only. These provisions/requirements are not required or authorized under the federal CWA; consequently, violations of these provisions/requirements are not subject to the enforcement remedies that are available for NPDES violations.

S. Notification of Interested Parties. The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe Waste Discharge Requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Details of notification are provided in the Fact Sheet of this Order.

T. Consideration of Public Comment. The Regional Water Board, in a public meeting, heard and considered all comments pertaining to the discharge. Details of the Public Hearing are provided in the Fact Sheet of this Order.

III. DISCHARGE PROHIBITIONS

A. Discharge of wastewater at a location or in a manner different from that described in the Findings is prohibited.

B. The by-pass or overflow of wastes to surface waters is prohibited, except as allowed by Federal Standard Provisions I.G. and I.H. (Attachment D).

C. Neither the discharge nor its treatment shall create a nuisance as defined in Section 13050 of the California Water Code.

IV. EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

A. Effluent Limitations

1. Final Effluent Limitations – Discharge Point 001

The Discharger shall maintain compliance with the following effluent limitations at Discharge Point 001, with compliance measured at Monitoring Location EFF-001 as described in the attached MRP (Attachment E):

a. The Discharger shall maintain compliance with the effluent limitations specified in Table 6:

Table 6. Effluent Limitations – Discharge Point 001

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Total Suspended Solids	mg/L	30	--	100	--	--
	lbs/day[1]	15.2	--	104.3	--	--
pH	standard units	--	--	--	6.5	8.5
Oil and Grease	mg/L	15	--	20	--	--
Electrical Conductivity	µmhos/cm	--	--	4650	--	--
Total Dissolved Solids	mg/L	--	--	3255	--	--
Aluminum	µg/L	72	--	141	--	--
Barium	µg/L	--	--	590	--	--
Chloride	mg/L	--	--	1060	--	--
Copper	µg/L	41	--	62	--	--
Cyanide	µg/L	25	--	43	--	--
Fluoride	mg/L	--	--	10	--	--
Iron	µg/L	--	--	300	--	--
Molybdenum	µg/L	--	--	49	--	--
Selenium	µg/L	9.8	--	26	--	--
	lbs/day	0.005	--	0.027	--	--
Sulfate	mg/L	--	--	1240	--	--
Dibromochloromethane	µg/L	4.0	--	8.0	--	--
Nitrate	mg/L	42	--	--	--	--
Chromium[2, 4]	mg/L	0.2	--	0.2	--	--
Zinc[2, 4]	mg/L	1.0	--	1.0	--	--
Priority Pollutants[2, 4]	µg/L	ND[3]	--	ND[3]	--	--
Free Available Chlorine	mg/L	0.2	--	0.5	--	--

1 Based on an average monthly discharge flow of 60,748 gpd, and a maximum daily flow of 125,000 gpd.

2 Limitation applies to chemicals added to cooling tower for maintenance. Compliance may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR Part 136

3 ND indicates non-detect

4 Chemicals added as corrosion inhibitors and biocides in the cooling tower shall not cause the effluent to exceed these effluent limits.

b. **Acute Whole Effluent Toxicity.** Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

   i. 70%, minimum for any one bioassay; and
   ii. 90%, median for any three consecutive bioassays.

c. **Temperature.** The maximum temperature of the discharge shall not exceed the natural receiving water temperature by more than 20°F and shall not exceed 86 ºF.

d. **Discharge Flow.** The Maximum Daily Discharge Flow shall not exceed 125,000 gallons per day.

B. Land Discharge Specifications

1. The pH in the storm water basin shall not be less than 6.5 or greater than 8.5.

2. The dissolved oxygen concentration of the storm water contained in the storm water basin shall not be less than 1.0 mg/l for 8 hours in any 24-hour period.

3. Two feet (2') of freeboard shall be maintained in the storm water basin at all times.

4. Storm water that is not used as cooling tower makeup water or for dust control shall remain within the designated disposal area at all times.

C. Reclamation Specifications – Not Applicable

V. RECEIVING WATER LIMITATIONS

A. Surface Water Limitations

Receiving water limitations are based on water quality objectives contained in the Basin Plan and are a required part of this Order. The discharge shall not cause the following in the San Joaquin River:

1. **Biostimulatory Substances**. Water to contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses.

2. **Chemical Constituents**. Chemical constituents to be present in concentrations that adversely affect beneficial uses.

3. **Color**. Discoloration that causes nuisance or adversely affects beneficial uses.

4. **Dissolved Oxygen**. The dissolved oxygen concentration to be reduced below 7.0 mg/L at any time.

5. **Floating Material**. Floating material to be present in amounts that cause nuisance or adversely affect beneficial uses.

6. **Oil and Grease**. Oils, greases, waxes, or other materials to be present in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses.

7. **pH**. The pH to be depressed below 6.5, raised above 8.5, nor changed by more than 0.5. A one-month averaging period may be applied when calculating the pH

change of 0.5 units.

8. **Pesticides**:

   a. Pesticides to be present, individually or in combination, in concentrations that adversely affect beneficial uses;
   b. Pesticides to be present in bottom sediments or aquatic life in concentrations that adversely affect beneficial uses;
   c. Total identifiable persistent chlorinated hydrocarbon pesticides to be present in the water column at concentrations detectable within the accuracy of analytical methods approved by USEPA or the Executive Officer**.**
   d. Pesticide concentrations to exceed those allowable by applicable antidegradation policies (see State Water Board Resolution No. 68-16 and 40 CFR §131.12.).
   e. Pesticide concentrations to exceed the lowest levels technically and economically achievable.
   f. Pesticides to be present in concentration in excess of the maximum contaminant levels set forth in California Code of Regulations, Title 22, Division 4, Chapter 15.
   g. Thiobencarb to be present in excess of 1.0 µg/L.

9. **Radioactivity**:

   a. Radionuclides to be present in concentrations that are harmful to human, plant, animal, or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal, or aquatic life.
   b. Radionuclides to be present in excess of the maximum contaminant levels specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations.

10. **Suspended Sediments**. The suspended sediment load and suspended sediment discharge rate of surface waters to be altered in such a manner as to cause nuisance or adversely affect beneficial uses.

11. **Settleable Substances**. Substances to be present in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses.

12. **Suspended Material**. Suspended material to be present in concentrations that cause nuisance or adversely affect beneficial uses.

13. **Taste and Odors**. Taste- or odor-producing substances to be present in concentrations that impart undesirable tastes or odors to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.

14. **Temperature**. The Thermal Plan is applicable to this discharge. The Thermal Plan requires that the discharge shall not cause the following in the San Joaquin River:

i. The creation of a zone, defined by water temperatures of more than 1°F above natural receiving water temperature, which exceeds 25 percent of the cross-sectional area of the river channel at any point.

ii. A surface water temperature to rise greater than 4°F above the natural temperature of the receiving water at any time or place

15. **Toxicity**. Toxic substances to be present, individually or in combination, in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.

16. **Turbidity**. The turbidity to increase as follows:

a. More than 1 Nephelometric Turbidity Unit (NTU) where natural turbidity is between 0 and 5 NTUs.
b. More than 20 percent where natural turbidity is between 5 and 50 NTUs.
c. More than 10 NTU where natural turbidity is between 50 and 100 NTUs.
d. More than 10 percent where natural turbidity is greater than 100 NTUs.

17. **Salinity**.

a. Maximum mean daily chloride concentration of 150 mg/L for at least the number of days shown during the Calendar Year. Must be provided in intervals of not less than two weeks duration (Percentage of Calendar Year shown in parenthesis)

Year Type	No. days each cal. Year < 150 mg/L Cl^-
Wet	240 (66%)
Above Normal	190 (52%)
Below Normal	175 (48%)
Dry	165 (45%)
Critical	155 (42%)

Note: Water year type is determined based on Figure III-2 in the Basin Plan.

b. If the SJ River TDS (EC) concentration is higher than 450 mg/l (700 μmhos/cm) then the discharge shall not cause an increase by more than 10% in TDS and in EC between receiving water monitoring stations RSW-001 and RSW-002. Compliance with these receiving water limitations will be verified by the receiving water monitoring, which will only be required when the Mirant Delta Power Plant is not discharging.

B. Groundwater Limitations

The discharge shall not cause the underlying groundwater to be degraded.

VI. PROVISIONS

A. Standard Provisions

1. The Discharger shall comply with all Standard Provisions included in Attachment D of this Order.

2. The Discharger shall comply with the following provisions:

   a. If the Discharger's wastewater treatment plant is publicly owned or subject to regulation by California Public Utilities Commission, it shall be supervised and operated by persons possessing certificates of appropriate grade according to Title 23, CCR, Division 3, Chapter 26.

   b. After notice and opportunity for a hearing, this Order may be terminated or modified for cause, including, but not limited to:

      i. violation of any term or condition contained in this Order;

      ii. obtaining this Order by misrepresentation or by failing to disclose fully all relevant facts;

      iii. a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge; and

      iv. a material change in the character, location, or volume of discharge.

      The causes for modification include:

      - *New regulations.* New regulations have been promulgated under Section 405(d) of the Clean Water Act, or the standards or regulations on which the permit was based have been changed by promulgation of amended standards or regulations or by judicial decision after the permit was issued.
      - *Land application plans.* When required by a permit condition to incorporate a land application plan for beneficial reuse of sewage sludge, to revise an existing land application plan, or to add a land application plan.
      - *Change in sludge use or disposal practice.* Under 40 Code of Federal Regulations (CFR) 122.62(a)(1), a change in the Discharger's sludge use or disposal practice is a cause for modification of the permit. It is cause for revocation and reissuance if the Discharger requests or agrees.

      The Regional Water Board may review and revise this Order at any time upon application of any affected person or the Regional Water Board's own motion.

   c. If a toxic effluent standard or prohibition (including any scheduled compliance specified in such effluent standard or prohibition) is established under Section 307(a) of the CWA, or amendments thereto, for a toxic pollutant that is present in the discharge authorized herein, and such standard or prohibition is more stringent than any limitation upon such pollutant in this Order, the Regional Water

Board will revise or modify this Order in accordance with such toxic effluent standard or prohibition.

The Discharger shall comply with effluent standards and prohibitions within the time provided in the regulations that establish those standards or prohibitions, even if this Order has not yet been modified.

d. This Order shall be modified, or alternately revoked and reissued, to comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a)(2) of the CWA, if the effluent standard or limitation so issued or approved:

   i. contains different conditions or is otherwise more stringent than any effluent limitation in the Order; or

   ii. controls any pollutant limited in the Order.

   The Order, as modified or reissued under this paragraph, shall also contain any other requirements of the CWA then applicable.

e. The provisions of this Order are severable. If any provision of this Order is found invalid, the remainder of this Order shall not be affected.

f. The Discharger shall take all reasonable steps to minimize any adverse effects to waters of the State or users of those waters resulting from any discharge or sludge use or disposal in violation of this Order. Reasonable steps shall include such accelerated or additional monitoring as necessary to determine the nature and impact of the non-complying discharge or sludge use or disposal.

g. The Discharger shall ensure compliance with any existing or future pretreatment standard promulgated by USEPA under Section 307 of the CWA, or amendment thereto, for any discharge to the municipal system.

h. The discharge of any radiological, chemical or biological warfare agent or high-level, radiological waste is prohibited.

i. A copy of this Order shall be maintained at the discharge facility and be available at all times to operating personnel. Key operating personnel shall be familiar with its content.

j. Safeguard to electric power failure:

   i. The Discharger shall provide safeguards to assure that, should there be reduction, loss, or failure of electric power, the discharge shall comply with the terms and conditions of this Order.

   ii. Upon written request by the Regional Water Board the Discharger shall submit a written description of safeguards. Such safeguards may include alternate power sources, standby generators, retention capacity, operating procedures, or other means. A description of the safeguards provided shall include an analysis of the frequency, duration, and impact of power failures

experienced over the past five years on effluent quality and on the capability of the Discharger to comply with the terms and conditions of the Order. The adequacy of the safeguards is subject to the approval of the Regional Water Board.

iii. Should the treatment works not include safeguards against reduction, loss, or failure of electric power, or should the Regional Water Board not approve the existing safeguards, the Discharger shall, within ninety days of having been advised in writing by the Regional Water Board that the existing safeguards are inadequate, provide to the Regional Water Board and USEPA a schedule of compliance for providing safeguards such that in the event of reduction, loss, or failure of electric power, the Discharger shall comply with the terms and conditions of this Order. The schedule of compliance shall, upon approval of the Regional Water Board, become a condition of this Order.

k. The Discharger, upon written request of the Regional Water Board, shall file with the Board a technical report on its preventive (failsafe) and contingency (cleanup) plans for controlling accidental discharges, and for minimizing the effect of such events. This report may be combined with that required under Regional Water Board Standard Provision VI.A.2.m.

The technical report shall:

i. Identify the possible sources of spills, leaks, untreated waste by-pass, and contaminated drainage. Loading and storage areas, power outage, waste treatment unit outage, and failure of process equipment, tanks and pipes should be considered.

ii. Evaluate the effectiveness of present facilities and procedures and state when they became operational.

iii. Predict the effectiveness of the proposed facilities and procedures and provide an implementation schedule containing interim and final dates when they will be constructed, implemented, or operational.

The Regional Water Board, after review of the technical report, may establish conditions which it deems necessary to control accidental discharges and to minimize the effects of such events. Such conditions shall be incorporated as part of this Order, upon notice to the Discharger.

l. A publicly owned treatment works (POTW) whose waste flow has been increasing, or is projected to increase, shall estimate when flows will reach hydraulic and treatment capacities of its treatment and disposal facilities. The projections shall be made in January, based on the last three years' average dry weather flows, peak wet weather flows and total annual flows, as appropriate. When any projection shows that capacity of any part of the facilities may be exceeded in four years, the Discharger shall notify the Regional Water Board by 31 January. A copy of the notification shall be sent to appropriate local elected officials, local permitting agencies and the press. Within 120 days of the

notification, the Discharger shall submit a technical report showing how it will prevent flow volumes from exceeding capacity or how it will increase capacity to handle the larger flows. The Regional Water Board may extend the time for submitting the report.

m. The Discharger shall submit technical reports as directed by the Executive Officer. All technical reports required herein that involve planning, investigation, evaluation, or design, or other work requiring interpretation and proper application of engineering or geologic sciences, shall be prepared by or under the direction of persons registered to practice in California pursuant to California Business and Professions Code, sections 6735, 7835, and 7835.1. To demonstrate compliance with Title 16, CCR, sections 415 and 3065, all technical reports must contain a statement of the qualifications of the responsible registered professional(s). As required by these laws, completed technical reports must bear the signature(s) and seal(s) of the registered professional(s) in a manner such that all work can be clearly attributed to the professional responsible for the work.

n. Laboratories that perform sample analyses must be identified in all monitoring reports submitted to the Regional Water Board and USEPA.

o. The Discharger shall conduct analysis on any sample provided by USEPA as part of the Discharge Monitoring Quality Assurance (DMQA) program. The results of any such analysis shall be submitted to USEPA's DMQA manager.

p. Effluent samples shall be taken downstream of the last addition of wastes to the treatment or discharge works where a representative sample may be obtained prior to mixing with the receiving waters. Samples shall be collected at such a point and in such a manner to ensure a representative sample of the discharge.

q. All monitoring and analysis instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary, at least yearly, to ensure their continued accuracy.

r. The Discharger shall file with the Regional Water Board technical reports on self-monitoring performed according to the detailed specifications contained in the Monitoring and Reporting Program attached to this Order.

s. The results of all monitoring required by this Order shall be reported to the Regional Water Board, and shall be submitted in such a format as to allow direct comparison with the limitations and requirements of this Order. Unless otherwise specified, discharge flows shall be reported in terms of the monthly average and the daily maximum discharge flows.

t. The Regional Water Board is authorized to enforce the terms of this permit under several provisions of the CWC, including, but not limited to, sections 13385, 13386, and 13387.

u. For POTWs, prior to making any change in the point of discharge, place of use, or purpose of use of treated wastewater that results in a decrease of flow in any

portion of a watercourse, the Discharger must file a petition with the State Water Board, Division of Water Rights, and receive approval for such a change. (CWC section 1211).

v. In the event the Discharger does not comply or will be unable to comply for any reason, with any prohibition, maximum daily effluent limitation, 1-hour average effluent limitation, or receiving water limitation contained in this Order, the Discharger shall notify the Regional Water Board by telephone (916) 464-3291 within 24 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within five days, unless the Regional Water Board waives confirmation. The written notification shall include the information required by Attachment D, Section V.E.1 [40 CFR section 122.41(l)(6)(i)].

B. Monitoring and Reporting Program (MRP) Requirements

1. The Discharger shall comply with the MRP, and future revisions thereto, in Attachment E of this Order.

C. Special Provisions

1. Reopener Provisions

a. This Order may be reopened for modification, or revocation and reissuance, as a result of the detection of a reportable priority pollutant generated by special conditions included in this Order. These special conditions may be, but are not limited to, fish tissue sampling, whole effluent toxicity, monitoring requirements on internal waste stream(s), and monitoring for surrogate parameters. Additional requirements may be included in this Order as a result of the special condition monitoring data.

b. Conditions that necessitate a major modification of a permit are described in 40 CFR section 122.62, including:

   i. If new or amended applicable water quality standards are promulgated or approved pursuant to Section 303 of the CWA, or amendments thereto, this permit may be reopened and modified in accordance with the new or amended standards.

   ii. When new information, that was not available at the time of permit issuance, would have justified different permit conditions at the time of issuance.

c. **Whole Effluent Toxicity.** As a result of a Toxicity Reduction Evaluation (TRE), this Order may be reopened to include a chronic toxicity limitation, a new acute toxicity limitation, and/or a limitation for a specific toxicant identified in the TRE. Additionally, if the State Water Board revises the SIP's toxicity control provisions that would require the establishment of numeric chronic toxicity effluent limitations, this Order may be reopened to include a numeric chronic toxicity effluent limitation based on the new provisions.

d. **Water Effects Ratios (WER) and Metal Translators.** A default WER of 1.0 has been used in this Order for calculating CTR criteria for applicable priority pollutant inorganic constituents. In addition, default dissolved-to-total metal translators have been used to convert water quality objectives from dissolved to total recoverable when developing effluent limitations for <constituent(s)>. If the Discharger performs studies to determine site-specific WERs and/or site-specific dissolved-to-total metal translators, this Order may be reopened to modify the effluent limitations for the applicable inorganic constituents.

2. Special Studies, Technical Reports and Additional Monitoring Requirements

a. **Chronic Whole Effluent Toxicity.** For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct chronic whole effluent toxicity testing, as specified in the Monitoring and Reporting Program (Attachment E, Section V.). Furthermore, this Provision requires the Discharger to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity. If the discharge exceeds the toxicity numeric monitoring trigger established in this Provision, the Discharger is required to initiate a Toxicity Reduction Evaluation (TRE), in accordance with an approved TRE Work Plan, and take actions to mitigate the impact of the discharge and prevent reoccurrence of toxicity. A TRE is a site-specific study conducted in a stepwise process to identify the source(s) of toxicity and the effective control measures for effluent toxicity. TREs are designed to identify the causative agents and sources of whole effluent toxicity, evaluate the effectiveness of the toxicity control options, and confirm the reduction in effluent toxicity. This Provision includes requirements for the Discharger to develop and submit a TRE Work Plan and includes procedures for accelerated chronic toxicity monitoring and TRE initiation.

i. **Toxicity Reduction Evaluation (TRE) Work Plan. Within 180 days of the effective date of this Order,** the Discharger shall submit to the Regional Water Board a TRE Work Plan for approval by the Executive Officer. The TRE Work Plan shall outline the procedures for identifying the source(s) of, and reducing or eliminating effluent toxicity. The TRE Work Plan must be developed in accordance with EPA guidance[2] and be of adequate detail to allow the Discharger to immediately initiate a TRE as required in this Provision.

ii. **Accelerated Monitoring and TRE Initiation.** When the numeric toxicity monitoring trigger is exceeded during regular chronic toxicity monitoring, and the testing meets all test acceptability criteria, the Discharger shall initiate accelerated monitoring as required in the Accelerated Monitoring Specifications. WET testing results exceeding the monitoring trigger during accelerated monitoring demonstrates a pattern of toxicity and requires the Discharger to initiate a TRE to address the effluent toxicity.

[2] See Attachment F (Fact Sheet) Section VII.B.2.a. for a list of EPA guidance documents that must be considered in development of the TRE Workplan.

iii. **Numeric Monitoring Trigger.** The numeric toxicity monitoring trigger is > **8 TUc** (where TUc = 100/NOEC). The monitoring trigger is not an effluent limitation; it is the toxicity threshold at which the Discharger is required to begin accelerated monitoring and/or initiate a TRE.

iv. **Accelerated Monitoring Specifications.** If the monitoring trigger is exceeded during regular chronic toxicity testing, within 14-days of notification by the laboratory of the test results, the Discharger shall initiate accelerated monitoring. Accelerated monitoring shall consist of four (4) chronic toxicity tests in a six-week period (i.e. one test every two weeks) using the species that exhibited toxicity. The following protocol shall be used for accelerated monitoring and TRE initiation:

a) If the results of four (4) consecutive accelerated monitoring tests do not exceed the monitoring trigger, the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring. However, notwithstanding the accelerated monitoring results, if there is adequate evidence of a pattern of effluent toxicity, the Executive Officer may require that the Discharger initiate a TRE.

b) If the source(s) of the toxicity is easily identified (i.e. temporary plant upset), the Discharger shall make necessary corrections to the facility and shall continue accelerated monitoring until four (4) consecutive accelerated tests do not exceed the monitoring trigger. Upon confirmation that the effluent toxicity has been removed, the Discharger may cease accelerated monitoring and resume regular chronic toxicity monitoring.

c) If the result of any accelerated toxicity test exceeds the monitoring trigger, the Discharger shall cease accelerated monitoring and initiate a TRE to investigate the cause(s) of, and identify corrective actions to reduce or eliminate effluent toxicity. Within thirty (30) days of notification by the laboratory of the test results exceeding the monitoring trigger during accelerated monitoring, the Discharger shall submit a TRE Action Plan to the Regional Water Board including, at minimum:

1) Specific actions the Discharger will take to investigate and identify the cause(s) of toxicity, including TRE WET monitoring schedule;

2) Specific actions the Discharger will take to mitigate the impact of the discharge and prevent the recurrence of toxicity; and

3) A schedule for these actions.

3. Best Management Practices and Pollution Prevention

a. **Salinity Evaluation and Minimization Plan.** The Discharger shall prepare and implement a salinity evaluation and minimization plan to address sources of salinity in its discharge to the San Joaquin River. The plan shall be completed and submitted to the Regional Water Board **within 9 months of the effective date of this Order** for approval by the Executive Officer. The plan shall identify

best management practices for limiting the salinity in the cooling water effluent discharges to the San Joaquin River.

4. Construction, Operation and Maintenance Specifications – Not Applicable

5. Special Provisions for Municipal Facilities (POTWs Only) – Not Applicable

6. Other Special Provisions

a. In the event of any change in control or ownership of land or waste discharge facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Regional Water Board.

To assume operation under this Order, the succeeding owner or operator must apply in writing to the Executive Officer requesting transfer of the Order. The request must contain the requesting entity's full legal name, the State of incorporation if a corporation, address and telephone number of the persons responsible for contact with the Regional Water Board and a statement. The statement shall comply with the signatory and certification requirements in the Federal Standard Provisions (Attachment D, Section V.B.) and state that the new owner or operator assumes full responsibility for compliance with this Order. Failure to submit the request shall be considered a discharge without requirements, a violation of the California Water Code. Transfer shall be approved or disapproved in writing by the Executive Officer.

7. Compliance Schedules – Not Applicable

VII. COMPLIANCE DETERMINATION

Compliance with the effluent limitations contained in section IV of this Order will be determined as specified below:

A. **Aluminum Effluent Limitations**. Compliance with the final effluent limitations for aluminum can be demonstrated using either total or acid-soluble (inductively coupled plasma/atomic emission spectrometry or inductively coupled plasma/mass spectrometry) analysis methods, as supported by US EPA's Ambient Water Quality Criteria for Aluminum document (EPA 440/5-86-008), or other standard methods that exclude aluminum silicate particles as approved by the Executive Officer.

ATTACHMENT A – DEFINITIONS

Arithmetic Mean (μ), also called the average, is the sum of measured values divided by the number of samples. For ambient water concentrations, the arithmetic mean is calculated as follows:

Arithmetic mean = $\mu = \Sigma x / n$ where: Σx is the sum of the measured ambient water concentrations, and n is the number of samples.

Average Monthly Effluent Limitation (AMEL): the highest allowable average of daily discharges over a calendar month, calculated as the sum of all daily discharges measured during a calendar month divided by the number of daily discharges measured during that month.

Average Weekly Effluent Limitation (AWEL): the highest allowable average of daily discharges over a calendar week (Sunday through Saturday), calculated as the sum of all daily discharges measured during a calendar week divided by the number of daily discharges measured during that week.

Best Practicable Treatment or Control (BPTC): BPTC is a requirement of State Water Resources Control Board Resolution 68-16 – "Statement of Policy with Respect to Maintaining High Quality of Waters in California" (referred to as the "Antidegradation Policy"). BPTC is the treatment or control of a discharge necessary to assure that, *"(a) a pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained."* Pollution is defined in CWC Section 13050(l). In general, an exceedance of a water quality objective in the Basin Plan constitutes "pollution".

Bioaccumulative pollutants are those substances taken up by an organism from its surrounding medium through gill membranes, epithelial tissue, or from food and subsequently concentrated and retained in the body of the organism.

Carcinogenic pollutants are substances that are known to cause cancer in living organisms.

Coefficient of Variation (*CV*) is a measure of the data variability and is calculated as the estimated standard deviation divided by the arithmetic mean of the observed values.

Daily Discharge: Daily Discharge is defined as either: (1) the total mass of the constituent discharged over the calendar day (12:00 am through 11:59 pm) or any 24-hour period that reasonably represents a calendar day for purposes of sampling (as specified in the permit), for a constituent with limitations expressed in units of mass or; (2) the unweighted arithmetic mean measurement of the constituent over the day for a constituent with limitations expressed in other units of measurement (e.g., concentration).

The daily discharge may be determined by the analytical results of a composite sample taken over the course of one day (a calendar day or other 24-hour period defined as a day) or by the

arithmetic mean of analytical results from one or more grab samples taken over the course of the day.

For composite sampling, if 1 day is defined as a 24-hour period other than a calendar day, the analytical result for the 24-hour period will be considered as the result for the calendar day in which the 24-hour period ends.

Detected, but Not Quantified (DNQ) are those sample results less than the RL, but greater than or equal to the laboratory's MDL.

Dilution Credit is the amount of dilution granted to a discharge in the calculation of a water quality-based effluent limitation, based on the allowance of a specified mixing zone. It is calculated from the dilution ratio or determined through conducting a mixing zone study or modeling of the discharge and receiving water.

Effluent Concentration Allowance (ECA) is a value derived from the water quality criterion/objective, dilution credit, and ambient background concentration that is used, in conjunction with the coefficient of variation for the effluent monitoring data, to calculate a long-term average (LTA) discharge concentration. The ECA has the same meaning as waste load allocation (WLA) as used in U.S. EPA guidance (Technical Support Document For Water Quality-based Toxics Control, March 1991, second printing, EPA/505/2-90-001).

Enclosed Bays means indentations along the coast that enclose an area of oceanic water within distinct headlands or harbor works. Enclosed bays include all bays where the narrowest distance between the headlands or outermost harbor works is less than 75 percent of the greatest dimension of the enclosed portion of the bay. Enclosed bays include, but are not limited to, Humboldt Bay, Bodega Harbor, Tomales Bay, Drake's Estero, San Francisco Bay, Morro Bay, Los Angeles-Long Beach Harbor, Upper and Lower Newport Bay, Mission Bay, and San Diego Bay. Enclosed bays do not include inland surface waters or ocean waters.

Estimated Chemical Concentration is the estimated chemical concentration that results from the confirmed detection of the substance by the analytical method below the ML value.

Estuaries means waters, including coastal lagoons, located at the mouths of streams that serve as areas of mixing for fresh and ocean waters. Coastal lagoons and mouths of streams that are temporarily separated from the ocean by sandbars shall be considered estuaries. Estuarine waters shall be considered to extend from a bay or the open ocean to a point upstream where there is no significant mixing of fresh water and seawater. Estuarine waters include~~d~~, but are not limited to, the Sacramento-San Joaquin Delta, as defined in Water Code section 12220, Suisun Bay, Carquinez Strait downstream to the Carquinez Bridge, and appropriate areas of the Smith, Mad, Eel, Noyo, Russian, Klamath, San Diego, and Otay rivers. Estuaries do not include inland surface waters or ocean waters.

Inland Surface Waters are all surface waters of the State that do not include the ocean, enclosed bays, or estuaries.

Instantaneous Maximum Effluent Limitation: the highest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous maximum limitation).

Instantaneous Minimum Effluent Limitation: the lowest allowable value for any single grab sample or aliquot (i.e., each grab sample or aliquot is independently compared to the instantaneous minimum limitation).

Maximum Daily Effluent Limitation (MDEL) means the highest allowable daily discharge of a pollutant, over a calendar day (or 24-hour period). For pollutants with limitations expressed in units of mass, the daily discharge is calculated as the total mass of the pollutant discharged over the day. For pollutants with limitations expressed in other units of measurement, the daily discharge is calculated as the arithmetic mean measurement of the pollutant over the day.

Median is the middle measurement in a set of data. The median of a set of data is found by first arranging the measurements in order of magnitude (either increasing or decreasing order). If the number of measurements (n) is odd, then the median = $X_{(n+1)/2}$. If n is even, then the median = $(X_{n/2} + X_{(n/2)+1})/2$ (i.e., the midpoint between the $n/2$ and $n/2+1$).

Method Detection Limit (MDL) is the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero, as defined in title 40 of the Code of Federal Regulations, Part 136, Attachment B, revised as of July 3, 1999.

Minimum Level (ML) is the concentration at which the entire analytical system must give a recognizable signal and acceptable calibration point. The ML is the concentration in a sample that is equivalent to the concentration of the lowest calibration standard analyzed by a specific analytical procedure, assuming that all the method specified sample weights, volumes, and processing steps have been followed.

Mixing Zone is a limited volume of receiving water that is allocated for mixing with a wastewater discharge where water quality criteria can be exceeded without causing adverse effects to the overall water body.

Not Detected (ND) are those sample results less than the laboratory's MDL.

Persistent pollutants are substances for which degradation or decomposition in the environment is nonexistent or very slow.

Pollutant Minimization Program (PMP) means waste minimization and pollution prevention actions that include, but are not limited to, product substitution, waste stream recycling, alternative waste management methods, and education of the public and businesses. The goal of the PMP shall be to reduce all potential sources of a priority pollutant(s) through pollutant minimization (control) strategies, including pollution prevention measures as appropriate, to maintain the effluent concentration at or below the water quality-based effluent limitation. Pollution prevention measures may be particularly appropriate for persistent bioaccumulative priority pollutants where there is evidence that beneficial uses are being

impacted. The Regional Water Board may consider cost effectiveness when establishing the requirements of a PMP. The completion and implementation of a Pollution Prevention Plan, if required pursuant to Water Code section 13263.3(d), shall be considered to fulfill the PMP requirements.

Pollution Prevention means any action that causes a net reduction in the use or generation of a hazardous substance or other pollutant that is discharged into water and includes, but is not limited to, input change, operational improvement, production process change, and product reformulation (as defined in Water Code section 13263.3). Pollution prevention does not include actions that merely shift a pollutant in wastewater from one environmental medium to another environmental medium, unless clear environmental benefits of such an approach are identified to the satisfaction of the State or Regional Water Board.

Reporting Level (RL) is the ML (and its associated analytical method) chosen by the Discharger for reporting and compliance determination from the MLs included in this Order. The MLs included in this Order correspond to approved analytical methods for reporting a sample result that are selected by the Regional Water Board either from Appendix 4 of the SIP in accordance with section 2.4.2 of the SIP or established in accordance with section 2.4.3 of the SIP. The ML is based on the proper application of method-based analytical procedures for sample preparation and the absence of any matrix interferences. Other factors may be applied to the ML depending on the specific sample preparation steps employed. For example, the treatment typically applied in cases where there are matrix-effects is to dilute the sample or sample aliquot by a factor of ten. In such cases, this additional factor must be applied to the ML in the computation of the RL.

Source of Drinking Water is any water designated as municipal or domestic supply (MUN) in a Regional Water Board Basin Plan.

Standard Deviation (σ) is a measure of variability that is calculated as follows:

$$\sigma = (\sum[(x - \mu)^2]/(n - 1))^{0.5}$$

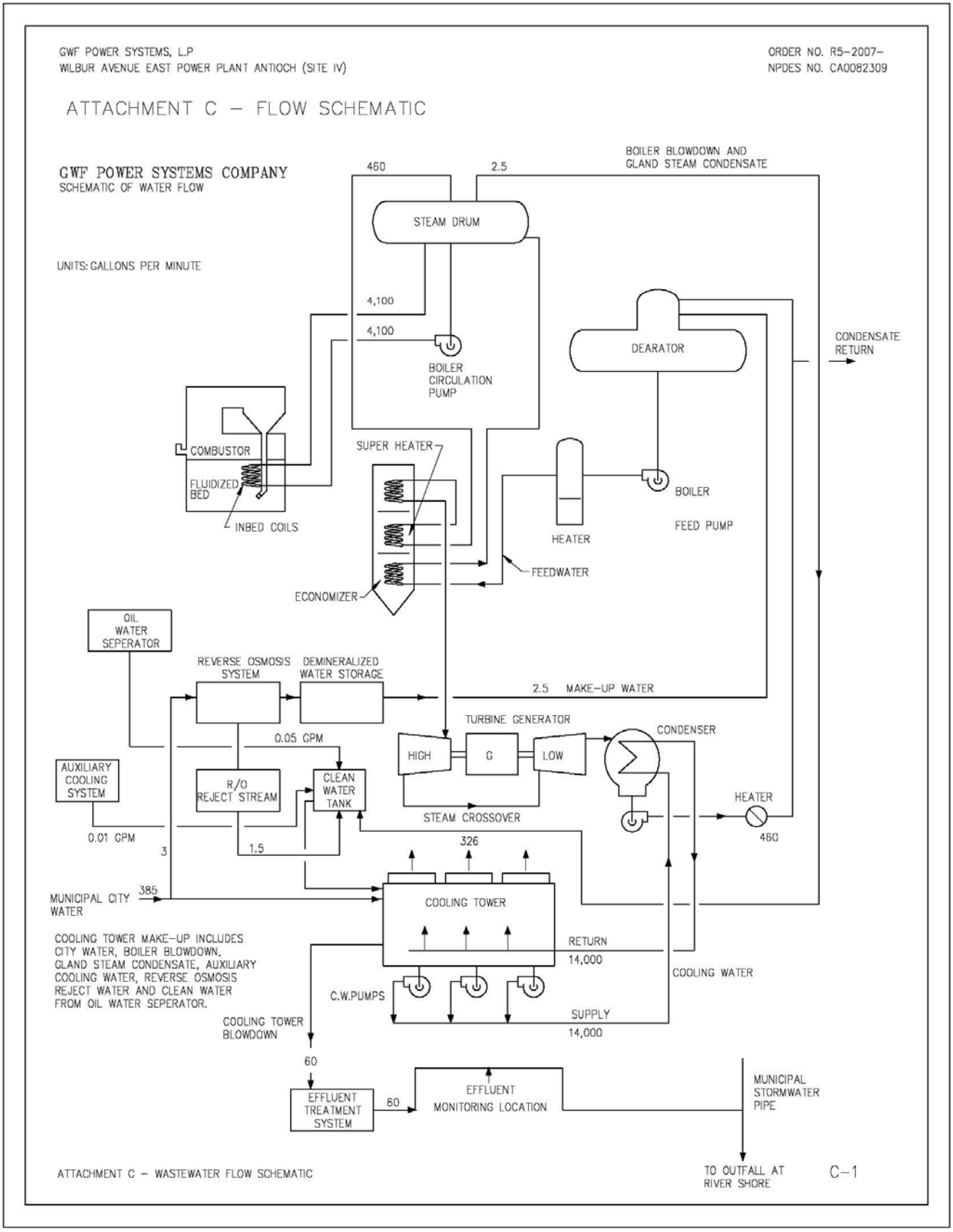
where:

x is the observed value;
μ is the arithmetic mean of the observed values; and
n is the number of samples.

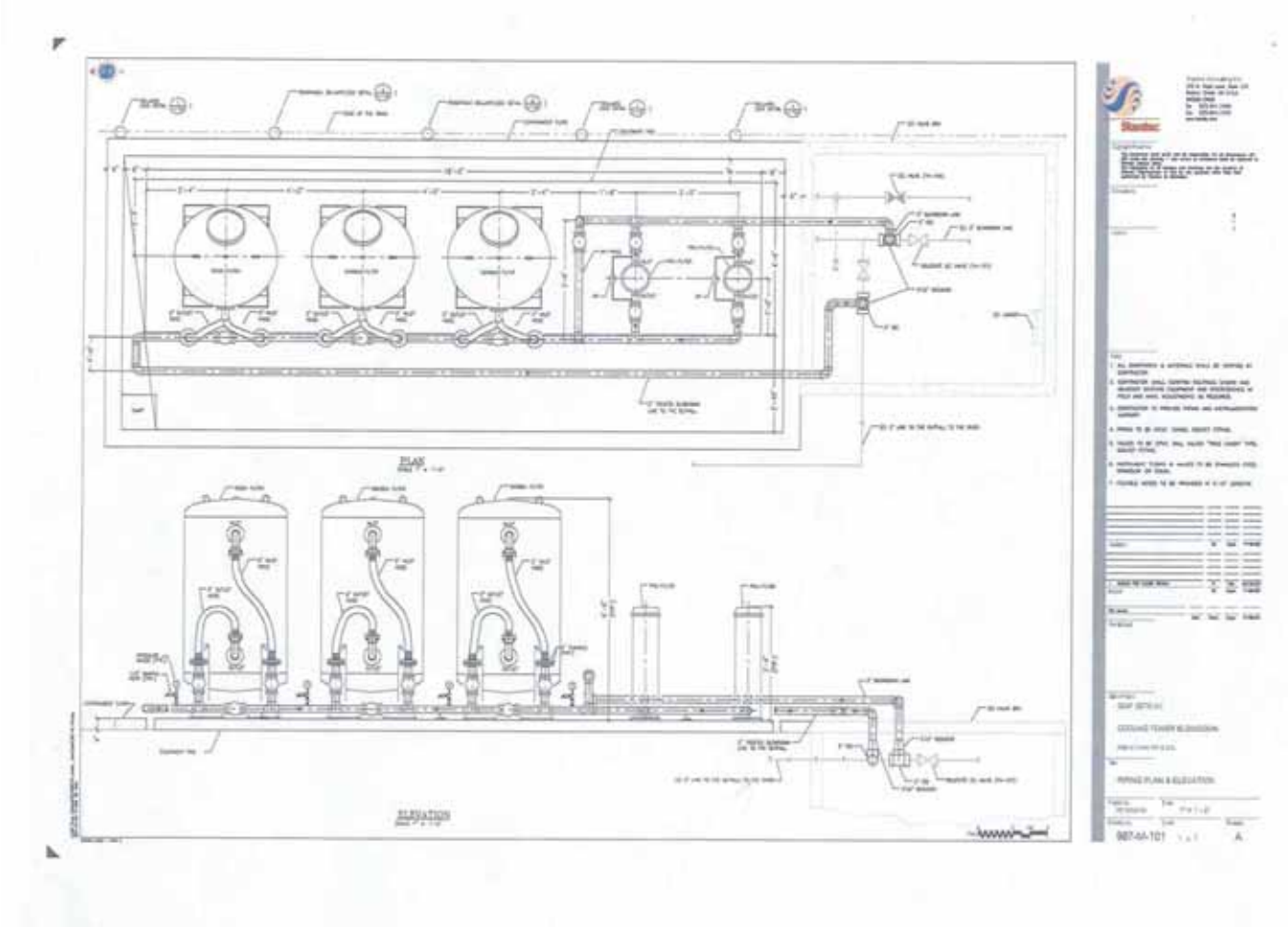
Toxicity Reduction Evaluation (TRE) is a study conducted in a step-wise process designed to identify the causative agents of effluent or ambient toxicity, isolate the sources of toxicity, evaluate the effectiveness of toxicity control options, and then confirm the reduction in toxicity. The first steps of the TRE consist of the collection of data relevant to the toxicity, including additional toxicity testing, and an evaluation of facility operations and maintenance practices, and best management practices. A Toxicity Identification Evaluation (TIE) may be required as part of the TRE, if appropriate. (A TIE is a set of procedures to identify the specific chemical(s) responsible for toxicity. These procedures are performed in three phases (characterization, identification, and confirmation) using aquatic organism toxicity tests.)

ATTACHMENT B – MAP

ATTACHMENT C – FLOW SCHEMATIC



METALS TREATMENT SYSTEM FLOW SCHEMATIC



ATTACHMENT D –STANDARD PROVISIONS

I. STANDARD PROVISIONS – PERMIT COMPLIANCE

A. Duty to Comply

1. The Discharger must comply with all of the conditions of this Order. Any noncompliance constitutes a violation of the Clean Water Act (CWA) and the California Water Code and is grounds for enforcement action, for permit termination, revocation and reissuance, or modification; or denial of a permit renewal application. (40 C.F.R. § 122.41(a).)

2. The Discharger shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants and with standards for sewage sludge use or disposal established under Section 405(d) of the CWA within the time provided in the regulations that establish these standards or prohibitions, even if this Order has not yet been modified to incorporate the requirement. (40 C.F.R. § 122.41(a)(1).)

B. Need to Halt or Reduce Activity Not a Defense

It shall not be a defense for a Discharger in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this Order. (40 C.F.R. § 122.41(c).)

C. Duty to Mitigate

The Discharger shall take all reasonable steps to minimize or prevent any discharge or sludge use or disposal in violation of this Order that has a reasonable likelihood of adversely affecting human health or the environment. (40 C.F.R. § 122.41(d).)

D. Proper Operation and Maintenance

The Discharger shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also includes adequate laboratory controls and appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems that are installed by a Discharger only when necessary to achieve compliance with the conditions of this Order. (40 C.F.R. § 122.41(e).)

E. Property Rights

1. This Order does not convey any property rights of any sort or any exclusive privileges. (40 C.F.R. § 122.41(g).)

2. The issuance of this Order does not authorize any injury to persons or property or invasion of other private rights, or any infringement of state or local law or regulations. (40 C.F.R. § 122.5(c).)

F. Inspection and Entry

The Discharger shall allow the Regional Water Board, State Water Board, United States Environmental Protection Agency (USEPA), and/or their authorized representatives (including an authorized contractor acting as their representative), upon the presentation of credentials and other documents, as may be required by law, to (40 C.F.R. § 122.41(i); Wat. Code, § 13383):

1. Enter upon the Discharger's premises where a regulated facility or activity is located or conducted, or where records are kept under the conditions of this Order (40 C.F.R. § 122.41(i)(1));

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order (40 C.F.R. § 122.41(i)(2));

3. Inspect and photograph, at reasonable times, any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order (40 C.F.R. § 122.41(i)(3)); and

4. Sample or monitor, at reasonable times, for the purposes of assuring Order compliance or as otherwise authorized by the CWA or the Water Code, any substances or parameters at any location. (40 C.F.R. § 122.41(i)(4).)

G. Bypass

1. Definitions

   a. “Bypass” means the intentional diversion of waste streams from any portion of a treatment facility. (40 C.F.R. § 122.41(m)(1)(i).)

   b. “Severe property damage” means substantial physical damage to property, damage to the treatment facilities, which causes them to become inoperable, or substantial and permanent loss of natural resources that can reasonably be expected to occur in the absence of a bypass. Severe property damage does not mean economic loss caused by delays in production. (40 C.F.R. § 122.41(m)(1)(ii).)

2. Bypass not exceeding limitations. The Discharger may allow any bypass to occur which does not cause exceedances of effluent limitations, but only if it is for essential maintenance to assure efficient operation. These bypasses are not subject to the provisions listed in Standard Provisions – Permit Compliance I.G.3, I.G.4, and I.G.5 below. (40 C.F.R. § 122.41(m)(2).)

3. Prohibition of bypass. Bypass is prohibited, and the Regional Water Board may take enforcement action against a Discharger for bypass, unless (40 C.F.R. § 122.41(m)(4)(i)):

    a. Bypass was unavoidable to prevent loss of life, personal injury, or severe property damage (40 C.F.R. § 122.41(m)(4)(i)(A));

    b. There were no feasible alternatives to the bypass, such as the use of auxiliary treatment facilities, retention of untreated wastes, or maintenance during normal periods of equipment downtime. This condition is not satisfied if adequate back-up equipment should have been installed in the exercise of reasonable engineering judgment to prevent a bypass that occurred during normal periods of equipment downtime or preventive maintenance (40 C.F.R. § 122.41(m)(4)(i)(B)); and

    c. The Discharger submitted notice to the Regional Water Board as required under Standard Provisions – Permit Compliance I.G.5 below. (40 C.F.R. § 122.41(m)(4)(i)(C).)

4. The Regional Water Board may approve an anticipated bypass, after considering its adverse effects, if the Regional Water Board determines that it will meet the three conditions listed in Standard Provisions – Permit Compliance I.G.3 above. (40 C.F.R. § 122.41(m)(4)(ii).)

5. Notice

    a. Anticipated bypass. If the Discharger knows in advance of the need for a bypass, it shall submit a notice, if possible at least 10 days before the date of the bypass. (40 C.F.R. § 122.41(m)(3)(i).)

    b. Unanticipated bypass. The Discharger shall submit notice of an unanticipated bypass as required in Standard Provisions - Reporting V.E below (24-hour notice). (40 C.F.R. § 122.41(m)(3)(ii).)

H. Upset

Upset means an exceptional incident in which there is unintentional and temporary noncompliance with technology based permit effluent limitations because of factors beyond the reasonable control of the Discharger. An upset does not include noncompliance to the extent caused by operational error, improperly designed treatment facilities, inadequate treatment facilities, lack of preventive maintenance, or careless or improper operation. (40 C.F.R. § 122.41(n)(1).)

1. Effect of an upset. An upset constitutes an affirmative defense to an action brought for noncompliance with such technology based permit effluent limitations if the requirements of Standard Provisions – Permit Compliance I.H.2 below are met. No determination made during administrative review of claims that noncompliance was

caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review. (40 C.F.R. § 122.41(n)(2).).

2. Conditions necessary for a demonstration of upset. A Discharger who wishes to establish the affirmative defense of upset shall demonstrate, through properly signed, contemporaneous operating logs or other relevant evidence that (40 C.F.R. § 122.41(n)(3)):

   a. An upset occurred and that the Discharger can identify the cause(s) of the upset (40 C.F.R. § 122.41(n)(3)(i));

   b. The permitted facility was, at the time, being properly operated (40 C.F.R. § 122.41(n)(3)(ii));

   c. The Discharger submitted notice of the upset as required in Standard Provisions – Reporting V.E.2.b below (24-hour notice) (40 C.F.R. § 122.41(n)(3)(iii)); and

   d. The Discharger complied with any remedial measures required under Standard Provisions – Permit Compliance I.C above. (40 C.F.R. § 122.41(n)(3)(iv).)

3. Burden of proof. In any enforcement proceeding, the Discharger seeking to establish the occurrence of an upset has the burden of proof. (40 C.F.R. § 122.41(n)(4).)

II. STANDARD PROVISIONS – PERMIT ACTION

A. General

This Order may be modified, revoked and reissued, or terminated for cause. The filing of a request by the Discharger for modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any Order condition. (40 C.F.R. § 122.41(f).)

B. Duty to Reapply

If the Discharger wishes to continue an activity regulated by this Order after the expiration date of this Order, the Discharger must apply for and obtain a new permit. (40 C.F.R. § 122.41(b).)

C. Transfers

This Order is not transferable to any person except after notice to the Regional Water Board. The Regional Water Board may require modification or revocation and reissuance of the Order to change the name of the Discharger and incorporate such other requirements as may be necessary under the CWA and the Water Code. (40 C.F.R. § 122.41(l)(3); § 122.61.)

III. STANDARD PROVISIONS – MONITORING

A. Samples and measurements taken for the purpose of monitoring shall be representative of the monitored activity. (40 C.F.R. § 122.41(j)(1).)

B. Monitoring results must be conducted according to test procedures under Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 503 unless other test procedures have been specified in this Order. (40 C.F.R. § 122.41(j)(4); § 122.44(i)(1)(iv).)

IV. STANDARD PROVISIONS – RECORDS

A. Except for records of monitoring information required by this Order related to the Discharger's sewage sludge use and disposal activities, which shall be retained for a period of at least five years (or longer as required by Part 503), the Discharger shall retain records of all monitoring information, including all calibration and maintenance records and all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used to complete the application for this Order, for a period of at least three (3) years from the date of the sample, measurement, report or application. This period may be extended by request of the Regional Water Board Executive Officer at any time. (40 C.F.R. § 122.41(j)(2).)

B. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements (40 C.F.R. § 122.41(j)(3)(i));

2. The individual(s) who performed the sampling or measurements (40 C.F.R. § 122.41(j)(3)(ii));

3. The date(s) analyses were performed (40 C.F.R. § 122.41(j)(3)(iii));

4. The individual(s) who performed the analyses (40 C.F.R. § 122.41(j)(3)(iv));

5. The analytical techniques or methods used (40 C.F.R. § 122.41(j)(3)(v)); and

6. The results of such analyses. (40 C.F.R. § 122.41(j)(3)(vi).)

C. Claims of confidentiality for the following information will be denied (40 C.F.R. § 122.7(b)):

1. The name and address of any permit applicant or Discharger (40 C.F.R. § 122.7(b)(1)); and

2. Permit applications and attachments, permits and effluent data. (40 C.F.R. § 122.7(b)(2).)

V. STANDARD PROVISIONS – REPORTING

A. Duty to Provide Information

The Discharger shall furnish to the Regional Water Board, State Water Board, or USEPA within a reasonable time, any information which the Regional Water Board, State Water Board, or USEPA may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order or to determine compliance with this Order. Upon request, the Discharger shall also furnish to the Regional Water Board, State Water Board, or USEPA copies of records required to be kept by this Order. (40 C.F.R. § 122.41(h); Wat. Code, § 13267.)

B. Signatory and Certification Requirements

1. All applications, reports, or information submitted to the Regional Water Board, State Water Board, and/or USEPA shall be signed and certified in accordance with Standard Provisions – Reporting V.B.2, V.B.3, V.B.4, and V.B.5 below. (40 C.F.R. § 122.41(k).)

2. All permit applications shall be signed by a responsible corporate officer. For the purpose of this section, a responsible corporate officer means: (i) A president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy- or decision-making functions for the corporation, or (ii) the manager of one or more manufacturing, production, or operating facilities, provided, the manager is authorized to make management decisions which govern the operation of the regulated facility including having the explicit or implicit duty of making major capital investment recommendations, and initiating and directing other comprehensive measures to assure long term environmental compliance with environmental laws and regulations; the manager can ensure that the necessary systems are established or actions taken to gather complete and accurate information for permit application requirements; and where authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures. (40 C.F.R. § 122.22(a)(1).)

3. All reports required by this Order and other information requested by the Regional Water Board, State Water Board, or USEPA shall be signed by a person described in Standard Provisions – Reporting V.B.2 above, or by a duly authorized representative of that person. A person is a duly authorized representative only if:

    a. The authorization is made in writing by a person described in Standard Provisions – Reporting V.B.2 above (40 C.F.R. § 122.22(b)(1));

    b. The authorization specifies either an individual or a position having responsibility for the overall operation of the regulated facility or activity such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative

may thus be either a named individual or any individual occupying a named position.) (40 C.F.R. § 122.22(b)(2)); and

c. The written authorization is submitted to the Regional Water Board and State Water Board. (40 C.F.R. § 122.22(b)(3).)

4. If an authorization under Standard Provisions – Reporting V.B.3 above is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Standard Provisions – Reporting V.B.3 above must be submitted to the Regional Water Board and State Water Board prior to or together with any reports, information, or applications, to be signed by an authorized representative. (40 C.F.R. § 122.22(c).)

5. Any person signing a document under Standard Provisions – Reporting V.B.2 or V.B.3 above shall make the following certification:

   "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations." (40 C.F.R. § 122.22(d).)

C. Monitoring Reports

1. Monitoring results shall be reported at the intervals specified in the Monitoring and Reporting Program (Attachment E) in this Order. (40 C.F.R. § 122.22(l)(4).)

2. Monitoring results must be reported on a Discharge Monitoring Report (DMR) form or forms provided or specified by the Regional Water Board or State Water Board for reporting results of monitoring of sludge use or disposal practices. (40 C.F.R. § 122.41(l)(4)(i).)

3. If the Discharger monitors any pollutant more frequently than required by this Order using test procedures approved under Part 136 or, in the case of sludge use or disposal, approved under Part 136 unless otherwise specified in Part 503, or as specified in this Order, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR or sludge reporting form specified by the Regional Water Board. (40 C.F.R. § 122.41(l)(4)(ii).)

4. Calculations for all limitations, which require averaging of measurements, shall utilize an arithmetic mean unless otherwise specified in this Order. (40 C.F.R. § 122.41(l)(4)(iii).)

D. Compliance Schedules

Reports of compliance or noncompliance with, or any progress reports on, interim and final requirements contained in any compliance schedule of this Order, shall be submitted no later than 14 days following each schedule date. (40 C.F.R. § 122.41(l)(5).)

E. Twenty-Four Hour Reporting

1. The Discharger shall report any noncompliance that may endanger health or the environment. Any information shall be provided orally within 24 hours from the time the Discharger becomes aware of the circumstances. A written submission shall also be provided within five (5) days of the time the Discharger becomes aware of the circumstances. The written submission shall contain a description of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance. (40 C.F.R. § 122.41(l)(6)(i).)

2. The following shall be included as information that must be reported within 24 hours under this paragraph (40 C.F.R. § 122.41(l)(6)(ii)):

   a. Any unanticipated bypass that exceeds any effluent limitation in this Order. (40 C.F.R. § 122.41(l)(6)(ii)(A).)

   b. Any upset that exceeds any effluent limitation in this Order. (40 C.F.R. § 122.41(l)(6)(ii)(B).)

3. The Regional Water Board may waive the above-required written report under this provision on a case-by-case basis if an oral report has been received within 24 hours. (40 C.F.R. § 122.41(l)(6)(iii).)

F. Planned Changes

The Discharger shall give notice to the Regional Water Board as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required under this provision only when (40 C.F.R. § 122.41(l)(1)):

1. The alteration or addition to a permitted facility may meet one of the criteria for determining whether a facility is a new source in section 122.29(b) (40 C.F.R. § 122.41(l)(1)(i)); or

2. The alteration or addition could significantly change the nature or increase the quantity of pollutants discharged. This notification applies to pollutants that are subject neither to effluent limitations in this Order nor to notification requirements under section 122.42(a)(1) (see Additional Provisions—Notification Levels VII.A.1). (40 C.F.R. § 122.41(l)(1)(ii).)

3. The alteration or addition results in a significant change in the Discharger's sludge use or disposal practices, and such alteration, addition, or change may justify the

application of permit conditions that are different from or absent in the existing permit, including notification of additional use or disposal sites not reported during the permit application process or not reported pursuant to an approved land application plan. (40 C.F.R.§ 122.41(l)(1)(iii).)

G. Anticipated Noncompliance

The Discharger shall give advance notice to the Regional Water Board or State Water Board of any planned changes in the permitted facility or activity that may result in noncompliance with General Order requirements. (40 C.F.R. § 122.41(l)(2).)

H. Other Noncompliance

The Discharger shall report all instances of noncompliance not reported under Standard Provisions – Reporting V.C, V.D, and V.E above at the time monitoring reports are submitted. The reports shall contain the information listed in Standard Provision – Reporting V.E above. (40 C.F.R. § 122.41(l)(7).)

I. Other Information

When the Discharger becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or in any report to the Regional Water Board, State Water Board, or USEPA, the Discharger shall promptly submit such facts or information. (40 C.F.R. § 122.41(l)(8).)

VI. STANDARD PROVISIONS – ENFORCEMENT

A. The Regional Water Board is authorized to enforce the terms of this permit under several provisions of the Water Code, including, but not limited to, sections 13385, 13386, and 13387.

VII. ADDITIONAL PROVISIONS – NOTIFICATION LEVELS

A. Non-Municipal Facilities

Existing manufacturing, commercial, mining, and silvicultural Dischargers shall notify the Regional Water Board as soon as they know or have reason to believe (40 C.F.R. § 122.42(a)):

1. That any activity has occurred or will occur that would result in the discharge, on a routine or frequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following "notification levels" (40 C.F.R. § 122.42(a)(1)):

    a. 100 micrograms per liter (µg/L) (40 C.F.R. § 122.42(a)(1)(i));

b. 200 µg/L for acrolein and acrylonitrile; 500 µg/L for 2,4-dinitrophenol and 2-methyl-4,6-dinitrophenol; and 1 milligram per liter (mg/L) for antimony (40 C.F.R. § 122.42(a)(1)(ii));

c. Five (5) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 C.F.R. § 122.42(a)(1)(iii)); or

d. The level established by the Regional Water Board in accordance with section 122.44(f). (40 C.F.R. § 122.42(a)(1)(iv).)

2. That any activity has occurred or will occur that would result in the discharge, on a non-routine or infrequent basis, of any toxic pollutant that is not limited in this Order, if that discharge will exceed the highest of the following “notification levels" (40 C.F.R. § 122.42(a)(2)):

a. 500 micrograms per liter (µg/L) (40 C.F.R. § 122.42(a)(2)(i));

b. 1 milligram per liter (mg/L) for antimony (40 C.F.R. § 122.42(a)(2)(ii));

c. Ten (10) times the maximum concentration value reported for that pollutant in the Report of Waste Discharge (40 C.F.R. § 122.42(a)(2)(iii)); or

d. The level established by the Regional Water Board in accordance with section 122.44(f). (40 C.F.R. § 122.42(a)(2)(iv).)

ATTACHMENT E – MONITORING AND REPORTING PROGRAM

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ATTACHMENT E – MONITORING AND REPORTING PROGRAM (MRP)

The Code of Federal Regulations section 122.48 requires that all NPDES permits specify monitoring and reporting requirements. Water Code Sections 13267 and 13383 also authorize the Regional Water Quality Control Board (Regional Water Board) to require technical and monitoring reports. This MRP establishes monitoring and reporting requirements, which implement the federal and state regulations.

I. GENERAL MONITORING PROVISIONS

A. Samples and measurements taken as required herein shall be representative of the volume and nature of the monitored discharge. All samples shall be taken at the monitoring locations specified below and, unless otherwise specified, before the monitored flow joins or is diluted by any other waste stream, body of water, or substance. Monitoring locations shall not be changed without notification to and the approval of this Regional Water Board.

B. Chemical, bacteriological, and bioassay analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. In the event a certified laboratory is not available to the Discharger, analyses performed by a noncertified laboratory will be accepted provided a Quality Assurance-Quality Control Program is instituted by the laboratory. A manual containing the steps followed in this program must be kept in the laboratory and shall be available for inspection by Regional Water Board staff. The Quality Assurance-Quality Control Program must conform to USEPA guidelines or to procedures approved by the Regional Water Board.

C. All analyses shall be performed in a laboratory certified to perform such analyses by the California Department of Health Services. Laboratories that perform sample analyses shall be identified in all monitoring reports.

D. Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. All monitoring instruments and devices used by the Discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year to ensure continued accuracy of the devices.

E. Monitoring results, including noncompliance, shall be reported at intervals and in a manner specified in this Monitoring and Reporting Program.

II. MONITORING LOCATIONS

The Discharger shall establish the following monitoring locations to demonstrate compliance with the effluent limitations, discharge specifications, and other requirements in this Order:

Table E-1. Monitoring Station Locations

Discharge Point Name	Monitoring Location Name	Monitoring Location Description (include Latitude and Longitude when available)
001	EFF-001	Effluent prior to entering Contra Costa County municipal stormwater pipe
	LND-001	Stormwater Basin
	RSW-001	San Joaquin River – 328 ft East of Discharge Point 001
	RSW-002	San Joaquin River – 328 ft West of Discharge Point 001

III. INFLUENT MONITORING REQUIREMENTS – NOT APPLICABLE

IV. EFFLUENT MONITORING REQUIREMENTS

A. Monitoring Location EFF- 001

1. The Discharger shall monitor final effluent discharge downstream from the last connection through which wastes can be admitted by the Facility into the municipal stormwater pipe. Effluent samples should be representative of the total volume and quality of the discharge. Date and time of collection of samples shall be recorded and reported.

Table E-2. Effluent Monitoring

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method and (Minimum Level, units), respectively
Flow	mgd	Meter	Continuous	
Total Residual Chlorine[1]	mg/L	Grab	1/day	
Temperature	°F	Grab	1/day	
pH	pH units	Grab	1/day	
Total Suspended Solids	mg/L	Grab	2/month	
Oil and Grease	mg/L	Grab	1/month	
Turbidity	NTU	Meter	1/month	
Ammonia (as N)[2]	mg/L	Grab	1/month	
Nitrate (as N)	mg/L	Grab	1/month	
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/month	
Total Dissolved Solids	mg/L	Grab	1/month	
Aluminum, Total	µg/L	Grab	1/month	
Barium	µg/L	Grab	1/month	
Molybdenum	µg/L	Grab	1/month	
Iron	µg/L	Grab	1/month	
Selenium (total recoverable)	µg/L	Grab	1/month	
Fluoride	mg/L	Grab	1/month	
Copper (total recoverable)	µg/L	Grab	1/month	

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method and (Minimum Level, units), respectively
Standard Minerals[4]	mg/L	Grab	1/permit term[6]	
Priority Pollutants[3, 5]	µg/L	Grab	1/permit term[6]	

[1] Total residual chlorine monitoring only required when chlorine is used at the Facility. If required to monitor, it must be monitored with a method sensitive to and accurate at 0.01 mg/L.

[2] Report as total.

[3] For priority pollutant constituents with effluent limitations, detection limits shall be below the effluent limitations. If the lowest minimum level (ML) published in Appendix 4 of the Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California (State Implementation Plan or SIP) is not below the effluent limitation, the detection limit shall be the lowest ML. For priority pollutant constituents without effluent limitations, the detection limits shall be equal to or less than the lowest ML published in Appendix 4 of the SIP.

[4] Standard minerals shall include the following: boron, calcium, iron, magnesium, potassium, sodium, chloride, manganese, phosphorus, total alkalinity (including alkalinity series), and hardness, and include verification that the analysis is complete (i.e. cation/anion balance).

[5] Concurrent with receiving surface water sampling.

[6] Shall be conducted during the 3rd year of the permit.

If the discharge is intermittent rather than continuous, then on the first day of each such intermittent discharge, the Discharger shall monitor and record data for all of the constituents listed above, after which the frequencies of analysis given in the schedule shall apply for the duration of each such intermittent discharge. In no event shall the Discharger be required to monitor and record data more often than twice the frequencies listed in the schedule.

V. WHOLE EFFLUENT TOXICITY TESTING REQUIREMENTS

A. **Acute Toxicity Testing.** The Discharger shall conduct acute toxicity testing to determine whether the effluent is contributing acute toxicity to the receiving water. The Discharger shall meet the following acute toxicity testing requirements:

1. *Monitoring Frequency* – the Discharger shall perform quarterly acute toxicity testing.

2. *Sample Types* – the samples shall be grab samples and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent monitoring location EFF-001.

3. *Test Species* – Test species shall be fathead minnows (*Pimephales promelas*).

4. *Methods* – The acute toxicity testing samples shall be analyzed using EPA-821-R-02-012, Fifth Edition. Temperature, total residual chlorine, and pH shall be recorded at the time of sample collection. No pH adjustment may be made unless approved by the Executive Officer.

5. *Test Failure* – If an acute toxicity test does not meet all test acceptability criteria, as specified in the test method, the Discharger must re-sample and re-test as soon as possible, not to exceed 7 days following notification of test failure.

B. **Chronic Toxicity Testing**. The Discharger shall conduct three species chronic toxicity testing to determine whether the effluent is contributing chronic toxicity to the receiving water. The Discharger shall meet the following chronic toxicity testing requirements:

1. *Monitoring Frequency* – the Discharger shall perform semi- annual (even years in July and October, odd years in January and April) three species chronic toxicity testing. The Discharger shall also conduct an additional test within 30 days of a change in the use of microbiocides.

2. *Sample Types* – Effluent samples shall be grab samples and shall be representative of the volume and quality of the discharge. The effluent samples shall be taken at the effluent monitoring location specified in the Monitoring and Reporting Program. The receiving water control shall be a grab sample obtained from the RSW-001 sampling location, as identified in the Monitoring and Reporting Program.

3. *Sample Volumes* – Adequate sample volumes shall be collected to provide renewal water to complete the test in the event that the discharge is intermittent.

4. *Test Species* – Chronic toxicity testing measures sublethal (e.g. reduced growth, reproduction) and/or lethal effects to test organisms exposed to an effluent compared to that of the control organisms. The Discharger shall conduct chronic toxicity tests with:

   - The cladoceran, water flea, *Ceriodaphnia dubia* (survival and reproduction test);
   - The fathead minnow, *Pimephales promelas* (larval survival and growth test); and
   - The green alga, *Selenastrum capricornutum* (growth test).

   The fresh water species may be substituted with marine species, namely the mysid *Americamysis bahia*, *Pimephales promelas* and *Selenastrum capricornutum* (3rd edition EPA-600-4-91-002) if the EC levels in the effluent are above 8750 µmhos/cm greater than 75% of the time, or 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.

5. *Methods* – The presence of chronic toxicity shall be estimated as specified in *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition,* EPA/821-R-02-013, October 2002.

6. *Reference Toxicant* – As required by the SIP, all chronic toxicity tests shall be conducted with concurrent testing with a reference toxicant and shall be reported with the chronic toxicity test results.

7. *Dilutions* – The chronic toxicity testing shall be performed using the dilution series identified in Table E-3, below. The receiving water control shall be used as the diluent (unless the receiving water is toxic).

8. *Test Failure* –The Discharger must re-sample and re-test as soon as possible, but no later than fourteen (14) days after receiving notification of a test failure. A test failure is defined as follows:

   a. The reference toxicant test or the effluent test does not meet all test acceptability criteria as specified in the *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms, Fourth Edition*, EPA/821-R-02-013, October 2002 (Method Manual), and its subsequent amendments or revisions; or

   b. The percent minimum significant difference (PMSD) measured for the test exceeds the upper PMSD bound variability criterion in Table 6 on page 52 of the Method Manual. (A retest is only required in this case if the test results do not exceed the monitoring trigger specified in Special Provisions VI. C.2.a.iii).

Table E-3. Chronic Toxicity Testing Dilution Series

Sample	Dilutions (%)					Controls	
	50	25	12.5	6.25	3.12	Receiving Water	Laboratory Water
% Effluent	50	25	12.5	6.25	3.12	0	0
% Receiving Water	50	75	87.5	93.75	96.88	100	0
% Laboratory Water	0	0	0	0	0	0	100

C. **WET Testing Notification Requirements**. The Discharger shall notify the Regional Water Board within 24-hrs after the receipt of test results exceeding the monitoring trigger during regular or accelerated monitoring, or an exceedance of the acute toxicity effluent limitation.

D. **WET Testing Reporting Requirements**. All toxicity test reports shall include the contracting laboratory's complete report provided to the Discharger and shall be in accordance with the appropriate "Report Preparation and Test Review" sections of the method manuals. At a minimum, whole effluent toxicity monitoring shall be reported as follows:

   1. **Chronic WET Reporting.** Regular chronic toxicity monitoring results shall be reported to the Regional Water Board within 30 days following completion of the test, and shall contain, at minimum:

      a. The results expressed in TUc, measured as 100/NOEC, and also measured as $100/LC_{50}$, $100/EC_{25}$, $100/IC_{25}$, and $100/IC_{50}$, as appropriate.

      b. The statistical methods used to calculate endpoints;

c. The statistical output page, which includes the calculation of the percent minimum significant difference (PMSD);

d. The dates of sample collection and initiation of each toxicity test; and

e. The results compared to the numeric toxicity monitoring trigger.

Additionally, the monthly discharger self-monitoring reports shall contain an updated chronology of chronic toxicity test results expressed in TUc, and organized by test species, type of test (survival, growth or reproduction), and monitoring frequency, i.e., either quarterly, monthly, accelerated, or TRE.

2. **Acute WET Reporting.** Acute toxicity test results shall be submitted with the monthly discharger self-monitoring reports and reported as percent survival.

3. **TRE Reporting.** Reports for Toxicity Reduction Evaluations shall be submitted in accordance with the schedule contained in the Discharger's approved TRE Work Plan.

4. **Quality Assurance (QA).** The Discharger must provide the following information for QA purposes (If applicable):

   a. Results of the applicable reference toxicant data with the statistical output page giving the species, NOEC, LOEC, type of toxicant, dilution water used, concentrations used, PMSD, and dates tested.

   b. The reference toxicant control charts for each endpoint, which include summaries of reference toxicant tests performed by the contracting laboratory.

   c. Any information on deviations or problems encountered and how they were dealt with.

VI. LAND DISCHARGE MONITORING REQUIREMENTS – LND-001

Table E-4. Stormwater Basin Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Freeboard	feet	Staff gage	1/month	
pH	Standard Units	Grab	1/month	
Electrical Conductivity @ 25°C	µmhos/cm	Grab	2/year[1]	
Dissolved Oxygen	mg/L	Grab	1/month	

[1] Storm water samples shall be collected during the first hour of discharge from the first storm event of the wet season (October 1 through May 30) and at least one other storm event in the wet season that results in a storm water discharge to the storm water basin.

VII. RECLAMATION MONITORING REQUIREMENTS – NOT APPLICABLE

VIII. RECEIVING WATER MONITORING REQUIREMENTS – SURFACE WATER AND GROUNDWATER

A. Monitoring Location – RSW-001 and RSW-002

The Discharger shall schedule receiving water monitoring events when Mirant Delta Contra Costa Power Plant is not discharging[5]. The Discharger shall monitor the Receiving Water at RSW-001 and RSW-002 as follows:

Table E-5. Receiving Water Monitoring Requirements

Parameter	Units	Sample Type	Minimum Sampling Frequency	Required Analytical Test Method
Temperature	°F (°C)	Grab	1/quarter	
Electrical Conductivity @ 25°C	µmhos/cm	Grab	1/quarter	
Chloride[1]	mg/L	Grab	1/quarter	
Dissolved Oxygen	mg/L	Grab	1/quarter	
pH	Standard Units	Grab	1/quarter	
Turbidity	NTU	Grab	1/quarter	
Hardness (as $CaCO_3$)[2]	mg/L	Grab	1/permit[4]	
Priority Pollutants[3]	µg/L	Grab	1/permit[4]	

1 Monitoring for chloride only required at RSW-002
2 Concurrent with sampling for priority pollutants
3 Monitoring for priority pollutants only required at RSW-001. Monitoring should take place concurrently with effluent monitoring for priority pollutants.
4 Shall be conducted during the 3rd year of the permit.
5 Monitoring only required when the Mirant Delta Contra Costa Power Plant has ceased discharging for a period of at least 48 hours.

In conducting the receiving water sampling, a log shall be kept of the receiving water conditions throughout the reach bounded by Stations RSW-001 and RSW-002. Attention shall be given to the presence or absence of:

a. Floating or suspended matter
b. Discoloration
c. Bottom deposits
d. Aquatic life
e. Visible films, sheens or coatings
f. Fungi, slimes, or objectionable growths
g. Potential nuisance conditions

Notes on receiving water conditions shall be summarized in the monitoring report.

IX. OTHER MONITORING REQUIREMENTS – NOT APPLICABLE

X. REPORTING REQUIREMENTS

A. General Monitoring and Reporting Requirements

1. The Discharger shall comply with all Standard Provisions (Attachment D) related to monitoring, reporting, and recordkeeping.

1. Upon written request of the Regional Water Board, the Discharger shall submit a summary monitoring report. The report shall contain both tabular and graphical summaries of the monitoring data obtained during the previous year(s).

2. **Compliance Time Schedules.** For compliance time schedules included in the Order, the Discharger shall submit to the Regional Water Board, on or before each compliance due date, the specified document or a written report detailing compliance or noncompliance with the specific date and task. If noncompliance is reported, the Discharger shall state the reasons for noncompliance and include an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Regional Water Board by letter when it returns to compliance with the compliance time schedule.

3. The Discharger shall report to the Regional Water Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986.

4. **Reporting Protocols.** The Discharger shall report with each sample result the applicable Reporting Level (RL) and the current Method Detection Limit (MDL), as determined by the procedure in Part 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 RL shall be reported as measured by the laboratory (i.e., the measured chemical concentration in the sample).

   b. Sample results less than the 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.

5. **Multiple Sample Data.** When determining compliance with an AMEL or MDEL 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 "Detected, but Not Quantified" (DNQ) or "Not Detected" (ND). In those cases, the Discharger shall compute the median in place of the arithmetic mean in accordance with the following procedure:

   a. 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.

   b. 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.

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 Self-Monitoring Reports (SMRs) using the State Water Board's California Integrated Water Quality System (CIWQS) Program Web site (http://www.waterboards.ca.gov/ciwqs/index.html). Until such notification is given, the Discharger shall submit hard copy SMRs. The CIWQS Web site will provide additional directions for SMR submittal in the event there will be service interruption for electronic submittal.

2. Monitoring results shall be submitted to the Regional Water Board by the **first day** of the second month following sample collection. Quarterly and annual monitoring results shall be submitted by the **first day of the second month following each calendar quarter, semi-annual period, and year**, respectively.

3. In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements. The highest daily maximum for the month, monthly averages, and medians shall be determined and recorded as needed to demonstrate compliance.

4. With the exception of flow, all constituents monitored on a continuous basis (metered), shall be reported as daily maximums, daily minimums, and daily averages; flow shall be reported as the total volume discharged per day for each day of discharge.

5. If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

6. A letter transmitting the self-monitoring reports shall accompany each report. Such a letter shall include a discussion of requirement violations found during the reporting period, and actions taken or planned for correcting noted violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions and/or a time schedule for implementing the corrective actions, reference to the previous correspondence will be satisfactory. The transmittal letter shall contain the penalty of perjury statement by the Discharger, or the Discharger's authorized agent, as described in the Standard Provisions.

7. 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:

   Regional Water Quality Control Board
   Central Valley Region
   11020 Sun Center Dr., Suite #200
   Rancho Cordova, CA 95670-6114

8. Monitoring periods and reporting for all required monitoring shall be completed according to the following schedule:

Table E-6. Monitoring Periods and Reporting Schedule

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period	SMR Due Date
Continuous	**<Permit effective date>**	**All**	**Submit with monthly SMR**
Daily	**<Permit effective date>**	**(Midnight through 11:59 PM) or any 24-hour period that reasonably represents a calendar day for purposes of sampling.**	**Submit with monthly SMR**
Monthly	**First day of calendar month following permit effective date or on permit effective date if that date is first day of the month**	**1st day of calendar month through last day of calendar month**	**Submit with monthly SMR**
Quarterly	**Closest of January 1, April 1, July 1, or October 1 following (or on) permit effective date**	**January 1 through March 31 April 1 through June 30 July 1 through September 30 October 1 through December 31**	**Submit with monthly SMR**
Semiannually	**Closest of January 1 or July 1 following (or on) permit effective date**	**January 1 through June 30 July 1 through December 31**	**Submit with monthly SMR**
Annually	**January 1 following (or on) permit effective date**	**January 1 through December 31**	**Submit with monthly SMR**

Sampling Frequency	Monitoring Period Begins On…	Monitoring Period	SMR Due Date
1 / 5 years	**Permit Effective Date**	**3rd year of permit period**	**3rd year of permit period**

C. Discharge Monitoring Reports (DMRs) – Not Applicable

D. Other Reports

1. Within **60 days** of permit adoption, the Discharger shall submit a report outlining minimum levels, method detection limits, and analytical methods for approval, with a goal to achieve detection levels below applicable water quality criteria. At a minimum, the Discharger shall comply with the monitoring requirements for CTR constituents as outlined in Section 2.3 and 2.4 of the *Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays, and Estuaries of California*, adopted 2 March 2000 by the State Water Resources Control Board. All peaks identified by analytical methods shall be reported.

2. **Annual Operations Report**. By **30 January** of submit a written report to the Executive Officer containing the following:

   a. The names and general responsibilities of all persons each year, the Discharger employed at the Facility.

   b. The names and telephone numbers of persons to contact regarding the plant for emergency and routine situations.

   c. A statement certifying when the flow meter(s) and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration.

   d. A statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the wastewater treatment plant as currently constructed and operated, and the dates when these documents were last revised and last reviewed for adequacy.

   e. The Discharger may also be requested to submit an annual report to the Regional Water Board with both tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

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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	
Discharger	GWF Power Systems, L.P.
Name of Facility	Wilbur Avenue East Power Plant Antioch (Site IV)
Facility Address	3400 Wilbur Avenue
	Antioch, CA 94509
	Contra Costa County
Facility Contact, Title and Phone	Mark Kehoe, Director, Environmental Safety Programs (925) 431-1440
Authorized Person to Sign and Submit Reports	Mark Kehoe, Director, Environmental Safety Programs (925) 431-1440
Mailing Address	4300 Railroad Ave. Pittsburgh, CA 94565
Billing Address	4300 Railroad Ave. Pittsburgh, CA 94565
Type of Facility	Electrical Power Generation (SIC 4911)
Major or Minor Facility	Minor
Threat to Water Quality	
Complexity	
Pretreatment Program	N/A
Reclamation Requirements	N/A
Facility Permitted Flow	0.125 mgd
Facility Design Flow	N/A
Watershed	Sacramento-San Joaquin Delta
Receiving Water	San Joaquin River
Receiving Water Type	Inland Surface Waters

A. GWF Power Systems, L.P. (hereinafter Discharger) is the owner and operator of the Wilbur Avenue East Power Plant Antioch (Site IV) (hereinafter Facility), an electrical power generation facility.
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 Facility discharges wastewater to the San Joaquin River, a water of the United States, and is currently regulated by Order R5-2002 0155 which was adopted on 6 September 2002 and expired on 1 September 2007. The terms and conditions of the current Order have been automatically continued and remain in effect until the new Waste Discharge Requirements and NPDES permit are adopted pursuant to this Order.

C. The Discharger filed a report of waste discharge and submitted an application for renewal of its Waste Discharge Requirements (WDRs) and National Pollutant Discharge Elimination System (NPDES) permit on 15 January 2007. Supplemental information was requested and received on 26 June 2007. A site visit was conducted on 17 June 2007 to tour the facility and observe operations.

II. FACILITY DESCRIPTION

The facility generates up to 19.2 megawatts of net electrical power from the burning of petroleum coke as its primary fuel. The fluid bed combustor is started up on natural gas and number-2 fuel oil. Coal is a potential alternative fuel. Water is used for cooling purposes and also for the production of steam. The source of water is the City of Antioch water supply as its primary source, and Site III's effluent as a secondary source (as cooling tower makeup only). As shown in Attachment C the water used for steam first enters a Reverse Osmosis System for purification, and then is fed into a deaerator. Water is then pumped to a heater followed by a fluidized bed combustor and finally a super heater where steam is produced.

A. Description of Wastewater and Biosolids Treatment or Controls

Make-up water (influent) to the cooling towers consists primarily of municipal water from the City of Antioch with minor contributions from boiler blowdown, gland steam condensate, auxiliary cooling system water, reverse osmosis reject water, and water from the oil/water separator, which collects water from equipment cleaning activities and stormwater secondary containment structures. Refer to Attachment B. The water in the cooling tower system is recycled approximately 6 to 8 times through the cooling tower before being discharged. The cooling tower blowdown results in a discharge of up to 125,000 gallons per day of wastewater. The effluent is discharged to the San Joaquin River via a 48 inch stormwater drain. Prior to discharge, the effluent passes through a membrane filter to remove biosolids, then activated carbon filter(s) and/or ion exchange resin or equivalent media to remove metals from the discharge.

The residual material from GWF's fluid bed combustor is considered a co-product of the process. The co-product consists of calcium sulfate, calcium oxide and minor amounts

of silicates. The co-product is marketed as Synthetic Gypsum to cement manufacturing industry.

B. Discharge Points and Receiving Waters

1. The Facility is located in Section 21, T2N, R2E, MDB&M, as shown in Attachment B (Figure B-1), a part of this Order.

2. Cooling tower blowdown water is discharged to a Contra Costa stormwater drain that discharges at Discharge Point 001 to the San Joaquin River, a water of the United States, at a point 38° 01' 12" North Latitude, 121° 45' 26" West Longitude, within the Sacramento-San Joaquin Delta.

C. Summary of Existing Requirements and Self-Monitoring Report (SMR) Data

Effluent limitations/Discharge Specifications contained in the existing Order for discharges from 001 (Monitoring Location EFF-001) and representative monitoring data from the term of the previous Order are as follows:

Table F-2. Historic Effluent Limitations and Monitoring Data

Parameter	Units	Effluent Limitation			Interim Effluent Limitation	Monitoring Data (From September 2003 – September 2006)		
		Average Monthly	Average Weekly	Maximum Daily	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
Flow	mgd			0.125				
Total Suspended Solids (TSS)	mg/L	30		100				36
	lbs/day[1]	31		104				
Total Dissolved Solids (TDS)	mg/L			3500				2500
	lbs/day[1]			3651				
Oil and Grease	mg/L	15		20				<5
	lbs/day[1]	15.6		20.9				
Aluminum	µg/L	87[2]		200	564			365
	lbs/day[1]	0.091		0.21	0.6			
Chloride	mg/L			830				790
	lbs/day[1]			866				
Chromium	µg/L			50				7.9
	lbs/day[1]			0.052				
Copper (freshwater)	µg/L	Variable[3]		Variable[3]	310			34
	lbs/day				0.32			
Copper (saltwater)[4]	µg/L	2.9		5.8				
	lbs/day	0.003		0.006				
Electrical Conductivity	µmhos/cm			5450				3900
Fluoride	mg/L			10				6.6

Parameter	Units	Effluent Limitation			Interim Effluent Limitation	Monitoring Data (From September 2003 – September 2006)		
		Average Monthly	Average Weekly	Maximum Daily	Maximum Daily	Highest Average Monthly Discharge	Highest Average Weekly Discharge	Highest Daily Discharge
	lbs/day[1]			10.4				
Iron	µg/L			300	4935			4800
	lbs/day[1]			0.31	5.15			
Lead	µg/L	Variable[3]		Variable[3]	28			1.5
	lbs/day[1]				0.03			
Molybdenum	µg/L			90				230
	lbs/day[1]			0.09				
Nickel	µg/L	21.3		43				17
	lbs/day[1]	0.022		0.045				
Selenium	µg/L	10		20	235			48
	lbs/day[1]	0.01		0.02	28			
Sulfate	mg/L			2620				1100
	lbs/day[1]			2733				
Thallium	µg/L	1.7		3.4	28			<2
	lbs/day[1]	0.0018		0.0034	0.03			
Zinc	µg/L	Variable[3]		Variable[3]	564			51
	lbs/day[1]				0.59			

[1] Mass limits based on maximum daily flow of 0.125 mgd
[2] 4-day average
[3] Effluent limitation varies with receiving water hardness
[4] Saltwater copper limit applied when EC in the receiving water is above 8750 µmhos/ cm. This condition never occurred during the permit period, therefore this effluent limitation was never applied.

D. Compliance Summary

Four serious violations of the effluent limitation for molybdenum were reported between 1 April 2004 and 31 March 2004. An Administrative Civil Liability Order in the amount of $12,000 was issued to the Discharger on 25 June 2004 for violating the effluent limitation for molybdenum and the penalty was paid by the Discharger.

E. Planned Changes

[Not Applicable]

III. APPLICABLE PLANS, POLICIES, AND REGULATIONS

The requirements contained in this Order are based on the applicable plans, policies, and regulations identified in section II of the Limitations and Discharge Requirements (Findings). This section provides supplemental information, where appropriate, for the plans, policies, and regulations relevant to the discharge.

A. Legal Authority

See Limitations and Discharge Requirements - Findings, Section II.C.

B. California Environmental Quality Act (CEQA)

See Limitations and Discharge Requirements - Findings, Section II.E.

C. State and Federal Regulations, Policies, and Plans

1. **Water Quality Control Plans**. The Regional Water Board adopted a *Water Quality Control Plan, Fourth Edition (Revised August 2006), for the Sacramento and San Joaquin River Basins* (Basin Plan) that designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve those objectives for all waters addressed through the plan. In addition, State Water Board Resolution No. 88-63 requires that, with certain exceptions, the Regional Water Board assign the municipal and domestic supply use to water bodies that do not have beneficial uses listed in the Basin Plan. The beneficial uses of the San Joaquin River downstream of the discharge are municipal and domestic supply, agricultural irrigation, agricultural stock watering, industrial process water supply, industrial service supply, water contact recreation, other non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm and cold fish migration habitat, warm spawning habitat, wildlife habitat, and navigation.

   The Basin Plan on page II-1.00 states: "*Protection and enhancement of existing and potential beneficial uses are primary goals of water quality planning…*" and with respect to disposal of wastewaters states that "...*disposal of wastewaters is [not] a prohibited use of waters of the State; it is merely a use which cannot be satisfied to the detriment of beneficial uses.*"

   The federal CWA section 101(a)(2), states: "*it is the national goal that wherever attainable, an interim goal of water quality which provides for the protection and propagation of fish, shellfish, and wildlife, and for recreation in and on the water be achieved by July 1, 1983.*" Federal Regulations, developed to implement the requirements of the CWA, create a rebuttable presumption that all waters be designated as fishable and swimmable. Federal Regulations, 40 CFR sections 131.2 and 131.10, require that all waters of the State regulated to protect the beneficial uses of public water supply, protection and propagation of fish, shell fish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation. Section 131.3(e), 40 CFR, defines existing beneficial uses as those uses actually attained after November 28, 1975, whether or not they are included in the water quality standards. Federal Regulation, 40 CFR section 131.10 requires that uses be obtained by implementing effluent limitations, requires that all downstream uses be protected and states that in no case shall a state adopt waste transport or waste assimilation as a beneficial use for any waters of the United States.

2. **Thermal Plan.** The State Water Board adopted a *Water Quality Control Plan for Control of Temperature in the Coastal and Interstate Water and Enclosed Bays and Estuaries of California* (Thermal Plan) on May 18, 1972, and amended this plan on September 18, 1975. This plan contains temperature objectives for surface waters. The cooling system blowdown water is classified as an elevated temperature waste under the Thermal Plan and is considered an existing discharger. Requirements of this Order implement the Thermal Plan. Self-monitoring data (i.e. quarterly monitoring of receiving water temperature) indicate that the Discharger is in compliance with the Thermal Plan.

3. **Bay-Delta Plan.** The *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (Bay-Delta Plan) was adopted in December 2006 by the State Water Board, superseding the 1995 Bay-Delta Plan. The Bay-Delta Plan identifies the beneficial uses of the estuary and includes objectives for flow, salinity, and endangered species protection.

   The Bay-Delta Plan attempts to create a management plan that is acceptable to the stakeholders while at the same time is protective of beneficial uses of the San Joaquin River. The State Water Board adopted Decision 1641 (D-1641) on December 29, 1999. D-1641 implements flow objectives for the Bay-Delta Estuary, approves a petition to change points of diversion of the Central Valley Project and the State Water Project in the Southern Delta, and approves a petition to change places of use and purposes of use of the Central Valley Project. The water quality objectives of the Bay-Delta Plan are implemented as part of this Order.

4. **Antidegradation Policy.** Section 131.12 requires that the state water quality standards 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. As discussed in detail in the Fact Sheet (Attachment F, Section IV.D.4.) the discharge is consistent with the antidegradation provisions of 40 CFR section 131.12 and State Water Board Resolution 68-16.

5. **Anti-Backsliding Requirements.** Sections 402(o)(2) and 303(d)(4) of the CWA and federal regulations at title 40, Code of Federal Regulations section 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. Compliance with the Anti-Backsliding requirements is discussed in Section IV.D.3.

6. **Stormwater Requirements.** USEPA promulgated Federal Regulations for storm water on 16 November 1990 in 40 CFR Parts 122, 123, and 124. The NPDES Industrial Storm Water Program regulates storm water discharges from wastewater

treatment facilities. Although Steam Power Generation plants are applicable industries under the Industrial Stormwater Program, stormwater generated at the GWF Facility is retained in an on-site stormwater basin and is not discharged to surface water, therefore the Facility does not require coverage under the Federal stormwater permit program. However, the Discharger can, if necessary, utilize stormwater for its plant operations, in which case, stormwater becomes co-mingled with the effluent and is subject to the effluent limitations and discharge prohibitions included in this Order. Regulation of the stormwater basin land disposal is also included in this order.

7. **Endangered *Species Act.*** This Order does not authorize any act that results in the taking of a threatened or endangered species or any act that is now prohibited, or becomes prohibited in the future, under either the California Endangered Species Act (Fish and Game Code sections 2050 to 2097) or the Federal Endangered Species Act (16 U.S.C.A. sections 1531 to 1544). This Order requires compliance with effluent limits, receiving water limits, and other requirements to protect the beneficial uses of waters of the state. The Discharger is responsible for meeting all requirements of the applicable Endangered Species Act.

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

1. Under Section 303(d) of the 1972 Clean Water Act, states, territories and authorized tribes are required to develop lists of water quality limited segments. The waters on these lists do not meet water quality standards, even after point sources of pollution have installed the minimum required levels of pollution control technology. On July 25, 2003 USEPA gave final approval to California's 2002 Section 303(d) List of Water Quality Limited Segments. The Basin Plan references this list of Water Quality Limited Segments (WQLSs), which are defined as "…*those sections of lakes, streams, rivers or other fresh water bodies where water quality does not meet (or is not expected to meet) water quality standards even after the application of appropriate limitations for point sources (40 CFR 130, et seq.)*." The Basin Plan also states, "*Additional treatment beyond minimum federal standards will be imposed on dischargers to [WQLSs]. Dischargers will be assigned or allocated a maximum allowable load of critical pollutants so that water quality objectives can be met in the segment.*" The Delta Waterways Central Portion, which includes the San Joaquin River near Antioch, is listed as a WQLS for chlorpyrifos, DDT, diazinon, exotic species, Group A pesticides, mercury and unknown toxicity in the 303(d) list of impaired water bodies. The discharge does not discharge these pollutants.

2. **Total Maximum Daily Loads.** The US EPA requires the Regional Water Board to develop total maximum daily loads (TMDLs) for each 303(d) listed pollutant and water body combination. Currently there are no TMDLs in effect for any of the pollutants listed above.

E. Other Plans, Polices and Regulations (Not Applicable)

IV. RATIONALE FOR EFFLUENT LIMITATIONS AND DISCHARGE SPECIFICATIONS

Effluent limitations and toxic and pretreatment effluent standards established pursuant to Sections 301 (Effluent Limitations), 302 (Water Quality Related Effluent Limitations), 304 (Information and Guidelines), and 307 (Toxic and Pretreatment Effluent Standards) of the Clean Water Act (CWA) and amendments thereto are applicable to the discharge.

The Federal CWA mandates the implementation of effluent limitations that are as stringent as necessary to meet water quality standards established pursuant to state or federal law [33 U.S.C., § 1311(b)(1)(C); 40 CFR, § 122.44(d)(1)]. NPDES permits must incorporate discharge limits necessary to ensure that water quality standards are met. This requirement applies to narrative criteria as well as to criteria specifying maximum amounts of particular pollutants. Pursuant to Federal Regulations, 40 CFR Section 122.44(d)(1)(i), NPDES permits must contain limits that control all pollutants that "*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, including state narrative criteria for water quality*." Federal Regulations, 40 CFR, §122.44(d)(1)(vi), further provide that "[w]*here a state has not established a water quality criterion for a specific chemical pollutant that is present in an effluent at a concentration that causes, has the reasonable potential to cause, or contributes to an excursion above a narrative criterion within an applicable State water quality standard, the permitting authority must establish effluent limits.*"

The CWA requires point source discharges 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: 40 CFR §122.44(a) requires that permits include applicable technology-based limitations and standards, and 40 CFR §122.44(d) requires that permits include water quality-based effluent limitations to attain and maintain applicable numeric and narrative water quality criteria to protect the beneficial uses of the receiving water where numeric water quality objectives have not been established. The Regional Water Board's Basin Plan, page IV-17.00, contains an implementation policy ("Policy for Application of Water Quality Objectives" that specifies that the Regional Water Board "*will, on a case-by-case basis, adopt numerical limitations in orders which will implement the narrative objectives*." This Policy complies with 40 CFR §122.44(d)(1). With respect to narrative objectives, the Regional Water Board must establish effluent limitations using one or more of three specified sources, including (1) EPA's published water quality criteria, (2) a proposed state criterion (*i.e.*, water quality objective) or an explicit state policy interpreting its narrative water quality criteria (*i.e.*, the Regional Water Board's "Policy for Application of Water Quality Objectives")(40 CFR 122.44(d)(1)(vi) (A), (B) or (C)), or (3) an indicator parameter. The Basin Plan contains a narrative objective requiring that: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life*" (narrative toxicity objective). The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, discoloration, toxic substances,

radionuclides, or taste and odor producing substances that adversely affect beneficial uses. The Basin Plan states that material and relevant information, including numeric criteria, and recommendations from other agencies and scientific literature will be utilized in evaluating compliance with the narrative toxicity objective. The Basin Plan also limits chemical constituents in concentrations that adversely affect surface water beneficial uses. For waters designated as municipal, the Basin Plan specifies that, at a minimum, waters shall not contain concentrations of constituents that exceed Maximum Contaminant Levels (MCL) of CCR Title 22. The Basin Plan further states that, to protect all beneficial uses, the Regional Water Board may apply limits more stringent than MCLs.

A. Discharge Prohibitions

1. As stated in section I.G of Attachment D, Standard Provisions, this Order prohibits bypass from any portion of the treatment facility. Federal Regulations, 40 CFR 122.41 (m), define “bypass” as the intentional diversion of waste streams from any portion of a treatment facility. This section of the Federal Regulations, 40 CFR 122.41 (m)(4), prohibits bypass unless it is unavoidable to prevent loss of life, personal injury, or severe property damage. In considering the Regional Water Board’s prohibition of bypasses, the State Water Board adopted a precedential decision, Order No. WQO 2002-0015, which cites the Federal Regulations, 40 CFR 122.41(m), as allowing bypass only for essential maintenance to assure efficient operation.

B. Technology-Based Effluent Limitations

1. Scope and Authority

The CWA requires that technology-based effluent limitations be established based on several levels of controls:

- Best practicable treatment control technology (BPT) represents the average of the best performance by plants within an industrial category or subcategory. BPT standards apply to toxic, conventional, and non-conventional pollutants.
- Best available technology economically achievable (BAT) represents the best existing performance of treatment technologies that are economically achievable within an industrial point source category. BAT standards apply to toxic and non-conventional pollutants.
- Best conventional pollutant control technology (BCT) represents the control from existing industrial point sources of conventional pollutants including BOD, TSS, fecal coliform, pH, and oil and grease. The BCT standard is established after considering the “cost reasonableness” of the relationship between the cost of attaining a reduction in effluent discharge and the benefits that would result, and also the cost effectiveness of additional industrial treatment beyond BPT.

The CWA requires USEPA to develop effluent limitations, guidelines and standards (ELGs) representing application of BPT, BAT, and BCT. The technology-based

monitoring requirements and effluent limitations for the steam electric power generating point source category at 40 CFR Part 423 are applicable to this discharge.

2. Applicable Technology-Based Effluent Limitations

a. **Federal Technology-Based Requirements.** The technology-based monitoring requirements and effluent limits for the steam electric power generating point source category at 40 CFR Sections 423.12 and 40 CFR Part 423.13 are applicable to this discharge.

i. The requirements of 40 CFR Section 423.12 (b)(3) are applicable to pollutants discharged from internal low volume waste sources. Low volume wastes are defined in 40 CFR Section 423.11 (b) to mean, taken collectively as if from one source, wastewater from all sources except those for which specified limitations are otherwise established in this part. Low volume waste sources include, but are not limited to: wet scrubber air pollution control systems, ion exchange water treatment system, water treatment evaporator blowdown, laboratory and sampling streams, boiler blowdown, floor drains, cooling tower basin cleaning wastes, and recirculating house service water systems. Sanitary and air conditioning wastes are not included.

ii. The requirements of 40 CFR Section 423.12 (b)(12) also state that in the event that waste streams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (b)(1) through (11) of this section attributable to each controlled waste source shall not exceed the specified limitations for that waste source.

iii. There are several wastewater sources at this facility that fall under the definition of low volume wastes. These include boiler blowdown, gland steam condensate, auxiliary cooling system water, oil/water separator waste, Reverse Osmosis (RO) reject water.

iv. The requirements of 40 CFR Section 423.12 (b)(7) are applicable to pollutants discharged into the effluent stream from the cooling tower blowdown.

v. The requirements of 40 CFR Section 423.13 (d)(1) are applicable to pollutants discharged in cooling tower blowdown and for any chemicals added for cooling tower maintenance. Submitting engineering calculations that demonstrate that the regulated pollutants are not detectable in the chemicals used for cooling tower maintenance can be used to determine compliance with these requirements.

vi. 423.12(b)(12) states that, "*In the event that wastestreams from various sources are combined for treatment or discharge, the quantity of each pollutant or pollutant property controlled in paragraphs (b)(1) through (11) of this section attributable to each controlled waste source shall not exceed the specified limitations for that waste source.*" The internal waste streams at the Facility are combined in a clean water sump and used as make up water in the cooling towers. Therefore, the technology-based limitations for each individual internal waste stream has been applied to the combined effluent.

Summary of Technology-based Effluent Limitations
Discharge Point 001

Table F-3. Summary of Technology-based Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Total Suspended Solids	mg/L	30		100		
Oil and Grease	mg/L	15		20		
Free Available Chlorine	mg/L	0.2		0.5		
Priority Pollutants[1]	µg/L	ND[2]		ND[2]		
Chromium[1]	mg/L	0.2		0.2		
Zinc[1]	mg/L	1.0		1.0		

[1] Limitation applies to any chemicals added for cooling tower maintenance except chromium and zinc, for which individual limitations are prescribed above.
[2] ND indicates no detectable concentration.

b. Discharge Flow Limitations. The Average Daily Flow Limitation of 60,748 gallons per day is based on the current plant performance and was determined as the average discharge flow released from the facility over the past five years. The Maximum Daily Flow Limitation of 125,000 gallons per day is based on the need for more frequent cooling tower blowdown events when influent water quality is poor (e.g. during drought conditions).

C. Water Quality-Based Effluent Limitations (WQBELs)

1. Scope and Authority

As specified in section 122.44(d)(1)(i), permits are required to include WQBELs for pollutants (including toxicity) that are or may be discharged at levels that cause, have reasonable potential to cause, or contribute to an in-stream excursion above any state water quality standard. 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 water

quality objectives and criteria that are contained in other state plans and policies, or any applicable water quality criteria contained in the CTR and NTR.

2. Applicable Beneficial Uses and Water Quality Criteria and Objectives

a. **Receiving Water.** Effluent from the Facility discharges into the San Joaquin River, a water of the United States. Beneficial uses that apply to the San Joaquin River downstream of the discharge are municipal and domestic supply, agricultural irrigation, agricultural stock watering, industrial process water supply, industrial service supply, water contact recreation, other non-contact water recreation, warm freshwater aquatic habitat, cold freshwater aquatic habitat, warm and cold fish migration habitat, warm spawning habitat, wildlife habitat, and navigation.

b. **Hardness.** While no effluent limitation for hardness is necessary in this Order, hardness is critical to the assessment of the need for, and the development of, effluent limitations for certain metals. The *California Toxics Rule* and the *National Toxics Rule* contain water quality criteria for seven metals that vary as a function of hardness, the lower the hardness the lower the water quality criteria. The hardness-dependent metals include cadmium, copper, chromium III, lead, nickel, silver, and zinc. The equation describing the total recoverable regulatory criterion is as follows:

$$\text{Total Recoverable Criterion} = e^{m[\ln(H)]+b} \qquad \text{(Equation 1)}$$

Where:

m = criterion-specific constant

H = Effluent Hardness

b = criterion-specific constant

The constants “m” and “b” are specific to both the metal under consideration, and the type of total recoverable criterion (i.e. acute or chronic).

Effluent limitations for the discharge must be set to protect the beneficial uses of the receiving water for all discharge conditions. In the absence of the option of including condition-dependent, “floating” effluent limitations that are reflective of actual conditions at the time of discharge, effluent limitations must be set using a reasonable worst-case condition in order to protect beneficial uses for all discharge conditions. Recent studies by Dr. Robert Emerick indicate that using the receiving water lowest hardness for establishing water quality criteria is not the most protective for the receiving water. The Regional Water Board has evaluated these studies and concurs that for some parameters the beneficial uses of the receiving water are best protected using the lowest hardness value of the effluent, while for some parameters, the use of both the highest hardness

value of the receiving water and the lowest hardness value of the effluent is the most protective.

Because of the non-linearity of the Total Recoverable Criterion equation, the relationship can be either concave downward or concave upward depending on the criterion-specific constants. For those contaminants whereby the regulatory criteria exhibit a concave downward relationship as a function of hardness (e.g. acute and chronic copper, chromium III, nickel, and zinc, and chronic cadmium), use of the lowest recorded effluent hardness for establishment of water quality objectives is fully protective of all beneficial uses regardless of whether the effluent or receiving water hardness is higher. For purposes of establishing water quality-based effluent limitations, a reported hardness value of 230 mg/L as $CaCO_3$ for the effluent was used.

c. **Assimilative Capacity/Mixing Zone.**

In April 1997, GWF Power Systems L.P., submitted an Outfall Dilution Study. The study modeled a range of combinations of discharge and receiving water conditions, including high and low river currents, high and low tides, and high and low effluent and receiving water densities. The Study assumed a 400,000 gpd effluent flow. Therefore, the dilution ratios are still very conservative despite the increase in blowdown flows from 100,000 gpd to 125,000 gpd. The Discharger's outfall is immediately adjacent to the 440 mgd Mirant Power Plant outfall 002. The study did not take into account the flows from the Mirant discharge. The results of the study predict that the plume may move into the river during periods of low current, but will typically move along the shoreline in a fairly narrow band during periods the current is flooding or ebbing. The study using the RDIFF model, an advection-diffusion model predicts that under worst scenarios, the discharge will achieve a dilution of 20:1 or greater within 388 feet from the discharge point, a dilution of 10:1 within 228 feet from the discharge point and a dilution of 5:1 within 126 feet from the discharge point. For the majority of the constituents a mixing zone where there is 10:1 dilution is sufficient enough.

The following is a correlation of dilution available and the size of the mixing zone based on the 1997 Outfall Dilution Study, according to the worst-case conditions.

Dilution Available	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Mixing Zone (ft)	0	50	78	104	126	148	170	190	208	228
Dilution Available	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
Mixing Zone (ft)	246	262	280	296	312	328	344	358	374	388

d. **Dilution Credit**

The section above describes the studies that were completed by the Discharger to determine an appropriate mixing zone. For the purpose of setting water quality-based effluent limitations, a dilution credit of 10:1 has been granted for limitations based on the chronic criteria for the protection of freshwater aquatic. Considering that a dilution credit of 1:1 results in immediate mixing (as shown above), a dilution credit of 1:1 has been applied for limitations based on the acute criteria.

3. Determining the Need for WQBELs

a. CWA section 301 (b)(1) requires NPDES permits to include effluent limitations that achieve technology-based standards and any more stringent limitations necessary to meet water quality standards. Water quality standards include Regional Water Board Basin Plan beneficial uses and narrative and numeric water quality objectives, State Water Board-adopted standards, and federal standards, including the CTR and NTR. The Basin Plan includes numeric site-specific water quality objectives and narrative objectives for toxicity, chemical constituents, and tastes and odors. The narrative toxicity objective states: "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at III-8.00.) With regards to the narrative chemical constituents objective, the Basin Plan states that waters shall not contain chemical constituents in concentrations that adversely affect beneficial uses. At minimum, "…*water designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents in excess of the maximum contaminant levels (MCLs)*" in Title 22 of CCR. The narrative tastes and odors objective states: "*Water shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses.*"

b. Federal regulations require effluent limitations for all pollutants that are or may be discharged at a level that will cause or have the reasonable potential to cause, or contribute to an in-stream excursion above a narrative or numerical water quality standard. Based on information submitted as part of the application, in studies, and as directed by monitoring and reporting programs, the Regional Water Board finds that the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a water quality standard for aluminum, barium, chloride, copper, electrical conductivity, total dissolved solids, sulfate, fluoride, iron, molybdenum, selenium, cyanide, dibromochloromethane, nitrate, and pH. Water quality-based effluent limitations (WQBELs) for these constituents are included in this Order. A detailed discussion of the RPA for each constituent is provided below.

c. The Regional Water Board conducted the RPA in accordance with Section 1.3 of the SIP. Although the SIP applies directly to the control of CTR priority pollutants, the State Water Board has held that the Regional Water Board may use the SIP as guidance for water quality-based toxics control.[1] The SIP states in the introduction "*The goal of this Policy is to establish a standardized approach for permitting discharges of toxic pollutants to non-ocean surface waters in a manner that promotes statewide consistency."* Therefore, in this Order the RPA procedures from the SIP were used to evaluate reasonable potential for both CTR and non-CTR constituents.

d. WQBELs were calculated in accordance with section 1.4 of the SIP, as described in Attachment F, Section IV.C.4.

e. **Aluminum***.* USEPA developed National Recommended Ambient Water Quality Criteria for protection of freshwater aquatic life for aluminum. The recommended four-day average (chronic) and one-hour average (acute) criteria for aluminum are 87 µg/L and 750 µg/L, respectively, for waters with a pH of 6.5 to 9.0. USEPA recommends that the ambient criteria are protective of the aquatic beneficial uses of receiving waters in lieu of site-specific criteria. The receiving water stream has been measured to have a low hardness—typically between 36 and 490 mg/L as $CaCO_3$. This condition is supportive of the applicability of the ambient water quality criteria for aluminum, according to USEPA's development document.

   The MEC for aluminum was 350 µg/L, based on 139 samples collected between September 2003 and September 2006, while the maximum observed upstream receiving water aluminum concentration was 3900 µg/L, based on 45 samples collected between September 2003 and December 2006. Therefore, aluminum in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above a level necessary to protect aquatic life resulting in a violation of the Basin Plan's narrative toxicity objective. Since the receiving water exceeds the acute and chronic toxicity criteria, no assimilative capacity for aluminum is available and a dilution credit cannot be allowed. This Order contains final Average Monthly Effluent Limitations (AMEL) and Maximum Daily Effluent Limitations (MDEL) for aluminum of 72 µg/L and 141 µg/L, respectively, based on USEPA's National Ambient Water Quality Criteria for the protection of freshwater aquatic life (See Attachment F, Table F-6 for WQBEL calculations).

   In USEPA's *Ambient Water Quality Criteria for Aluminum—1988* [EPA 440/5-86-008], USEPA states that "[a]*cid-soluble aluminum…is probably the best measurement at the present…*"; however, USEPA has not yet approved an acid-soluble test method for aluminum. Replacing the ICP/AES portion of the analytical procedure with ICP/MS would allow lower detection limits to be achieved. Based on USEPA's discussion of aluminum analytical methods, this

[1] See, Order WQO 2001-16 (Napa) and Order WQO 2004-0013 (Yuba City)

Order allows the use of the alternate aluminum testing protocol described above to meet monitoring requirements.

The Discharger has installed a new treatment system that includes membrane filtration, activated carbon and/or ion exchange resin or equivalent treatment. These processes will reduce aluminum concentrations and allow the Discharger to meet these effluent limitations.

f. **Ammonia.** Ammonia is known to cause toxicity to aquatic organisms in surface waters. Discharges of ammonia would violate the Basin Plan narrative toxicity objective. Applying 40 CFR section 122.44(d)(1)(vi)(B), it is appropriate to use USEPA's Ambient National Water Quality Criteria for the Protection of Freshwater Aquatic Life for ammonia, which was developed to be protective of aquatic organisms.

USEPA's *Ambient Water Quality Criteria for the Protection of Freshwater Aquatic Life*, for total ammonia, recommends acute (1-hour average; criteria maximum concentration) standards based on pH and chronic (30-day average, criteria continuous concentration) standards based on pH and temperature. It also recommends a maximum four-day average concentration of 2.5 times the criteria continuous concentration. USEPA found that as pH increased, both the acute and chronic toxicity of ammonia increased. Salmonids were more sensitive to acute toxicity effects than other species. However, while the acute toxicity of ammonia was not influenced by temperature, it was found that invertebrates and young fish experienced increasing chronic toxicity effects with increasing temperature. Because the San Joaquin River has a beneficial use of cold freshwater habitat and the presence of salmonids is well documented, the recommended criteria for waters where salmonids are present would be used. USEPA's recommended criteria are show below:

$$CCC_{30-day} = \left(\frac{0.0577}{1+10^{7.688-pH}} + \frac{2.487}{1+10^{pH-7.688}} \right) \times MIN\left(2.85, 1.45 \cdot 10^{0.028(25-T)}\right), \text{ and}$$

$$CMC = \left(\frac{0.275}{1+10^{7.204-pH}} + \frac{39.0}{1+10^{pH-7.204}} \right),$$

where *T* is in degrees Celsius

Ammonia was detected in the effluent with an MEC of 7.7 mg/L based on 9 samples collected between September 2002 and June 2007, while the maximum concentration of ammonia in the San Joaquin River was 0.26 mg/L, based on 2 samples collected between September 2002 and June 2007. However, the high effluent ammonia sample is suspect, because there are no known sources for ammonia to enter the cooling water at the facility.

GWF stores 24.5 % aqueous ammonia in an unpressurized 11,000 gallon steel storage tank at the facility. Ammonia is used in the combustion process to

reduce NOx air emissions. The tank is installed inside an impervious concrete secondary containment structure designed with sufficient freeboard to contain a spill equal to the entire tank volume plus precipitation and structural and procedural Best Management Practices and site safety procedures are used to prevent spills during transfers from tank trucks into the storage system. It is highly unlikely that ammonia could get into the cooling water from this source.

Since only 9 effluent samples were analyzed for ammonia, and all except one were non-detect (<0.33 mg/L), a WQBEL for ammonia is not included in this Order. Due to the uncertainty of the ammonia data, monthly effluent monitoring for ammonia is required to complete the RPA for ammonia.

g. **Barium.** The Basin Plan includes a site-specific (San Joaquin River within the Delta) receiving water objective for barium of 100 µg/l. The MEC for barium was 365 µg/L, based on 3 samples collected between September 2002 and September 2006, while the maximum observed upstream receiving water barium concentration was 51 µg/L, based on 2 samples collected between September 2002 and December 2002. Therefore, barium in the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's site-specific objective for barium for the Sacramento-San Joaquin Delta. A dilution credit 10:1 is allowed since the ambient monitoring data demonstrates the receiving water has assimilative capacity for barium. Therefore, this Order includes an effluent limitation for barium of 590 µg/l as a daily maximum. Based on the monitoring data for the effluent, it appears the Discharger can meet this new limitation.

h. **Chlorine Residual.** The Discharger does not currently use chlorine at the Facility, nor intends to use it in the future. Instead, the Discharger uses a bromine based microbiocide to maintain the cooling towers. The Discharger uses the City of Antioch municipal water for its water supply that may contain chlorine, which is extremely toxic to aquatic organisms. However, any chlorine in the make up water from the municipal water supply would be immediately reduced through microbial activity or evaporation in the cooling towers, therefore, the discharge does not have a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's narrative toxicity objective.

i. **Copper.** The CTR includes hardness-dependent criteria for the protection of freshwater aquatic life for copper. The criteria for copper are presented in dissolved concentrations. USEPA recommends conversion factors to translate dissolved concentrations to total concentrations. The USEPA default conversion factors for copper in freshwater are 0.96 for both the acute and the chronic criteria. Using the worst-case measured hardness from the effluent (230 mg/L as $CaCO_3$) and the USEPA recommended dissolved-to-total translator, the applicable chronic criterion (maximum four-day average concentration) is 19 µg/L and the applicable acute criterion (maximum one-hour average concentration) is 31 µg/L, as total recoverable copper. The Basin Plan contains a site-specific water quality objective for copper for the Sacramento-San Joaquin Delta of 10

µg/L, which with application of the EPA translator for copper becomes10.4 µg/L.

The MEC for total copper was 31 µg/L, based on 70 samples collected between September 2003 and December 2006, while the maximum observed upstream receiving water total copper concentration was 6.2 µg/L, based on 12 samples collected between October 2003 and December 2006. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for copper. A dilution credit 10:1 is allowed for the chronic condition, since the ambient monitoring data demonstrates the receiving water has assimilative capacity for copper. A dilution credit of 1:1 has been granted for the acute condition. An AMEL and MDEL for total copper of 41 µg/L and 62 µg/L, respectively, is included in this Order based on the CTR criteria for the protection of aquatic life (See Attachment F, Table F-7 for WQBEL calculations). Based on the monitoring data for the effluent, it appears the Discharger can meet these new limitations.

j. **Cyanide.** The CTR includes maximum 1-hour average and 4-day average cyanide concentrations of 22 µg/L and 5.2 µg/L, respectively, for the protection of freshwater aquatic life. The MEC for cyanide was 9.9 µg/L, based on 9 samples collected between September 2002 and June 2007, while the maximum observed upstream receiving water cyanide concentration was <2.0 µg/L, based on 7 samples collected between May 2007 and June 2007. . Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for cyanide. A dilution credit 10:1 for the chronic condition and 1:1 for the acute condition is allowed because monitoring data indicates there is assimilative capacity for cyanide in the receiving water. An AMEL and MDEL for cyanide of 25 µg/L and 43 µg/L, respectively, are included in this Order based on CTR criteria for the protection of freshwater aquatic life (See Attachment F, Table F-7 for WQBEL calculations). Based on the sample results in the effluent, it appears the Discharger can meet these new limitations.

k. **Dibromochloromethane.** The CTR includes a dibromochloromethane criterion of 0.41 µg/L for the protection of human health and is based on a one-in-a-million cancer risk for waters from which both water and organisms are consumed. The MEC for dibromochloromethane was 0.76 µg/L, based on 6 samples collected between September 2002 and April 2007, while the maximum observed upstream receiving water dibromochloromethane concentration was <0.05 µg/L, based on 2 samples collected between September 2002 and December 2007. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criterion for dibromochloromethane.

The ambient monitoring demonstrates the receiving water has assimilative capacity for dibromochloromethane. A dilution credit for dibromochloromethane of up to 10:1 can be granted. An AMEL and MDEL for dibromochloromethane of 4.0 µg/L and 8.0 µg/L, respectively, are included in this Order based on the CTR criterion for the protection of human health (See Attachment F, Table F-10 for

WQBEL calculations). Based on the sample results in the effluent, it appears the Discharger can meet these new limitations.

l. **Electrical Conductivity. (see Subsection t. Salinity)**

m. **Fluoride.** The State's Primary MCLs for fluoride is 2000 µg/l. and the Agricultural Water Quality Goal for fluoride is 1000 µg/l. The MEC for fluoride in the effluent was 6600 µg/l from 35 samples collected between September 2003 and September 2006. Fluoride was not detected (<1000 µg/l) in the receiving water. Based on this information, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the agricultural water quality goal of 1000 µg/l. Therefore, an effluent limitation for fluoride is included in this Order based on the agricultural water quality goal and a conservative dilution of 10:1 and is established as 10 mg/l as a daily maximum.

n. **Iron.** The Secondary MCL - Consumer Acceptance Limit for iron is 300 µg/L. The MEC for iron was 4800 µg/L, based on 76 samples collected between September 2003 and September 2006, while the maximum observed upstream receiving water iron concentration was 2350 µg/L, based on 30 samples collected between September 2003 and September 2006. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Secondary MCL for iron. The receiving water has exceeded the Secondary MCL for iron; therefore, no assimilative capacity is available for iron in the receiving water. A maximum daily effluent limitation of 300 µg/L is included in this Order based on protection of the Basin Plan's narrative chemical constituents objective. The Discharger has installed a new treatment system that includes membrane filtration, activated carbon and/or ion exchange resin or equivalent treatment. These processes will reduce iron concentrations and allow the Discharger to meet these effluent limitations.

o. **Molybdenum.** *Water Quality for Agriculture,* Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985), recommends that the molybdenum concentration in waters used for agricultural irrigation not exceed 10 µg/L. Applying the Basin Plan "Policy for Application of Water Quality Objectives", the numeric standard that implements the narrative objective is the Agricultural Water Quality Goal of 10 µg/L.

The MEC for molybdenum was 12 µg/L, based on 48 samples collected between September 2003 and September 2006, while the maximum observed upstream receiving water molybdenum concentration was 5 µg/L, based on 11 samples collected between September 2003 and December 2006. Therefore, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the Basin Plan's chemical constituents objective. An MDEL of 49 µg/L for molybdenum is included in this Order based on protection of the Basin Plan's narrative chemical constituents objective. A dilution credit 10:1 is allowed since the ambient monitoring data demonstrates the receiving water has

assimilative capacity for molybdenum. Based on the effluent monitoring data, it appears the Discharger can meet this new limitation.

p. **Selenium** The CTR Water Quality Criteria for selenium for the protection of freshwater aquatic life expressed as total recoverable concentrations for acute and chronic scenarios are 20 µg/l and 5 µg/l respectively. Selenium was detected in the effluent samples with a maximum total concentration of 48 µg/l. The maximum background concentration for total selenium in the receiving water was 4.1 µg/l. Based on available data, the discharge has a reasonable potential to cause or contribute to an in-stream excursion above the CTR criteria for the protection of freshwater aquatic life. Therefore, this Order includes effluent limitations for selenium, based on the CTR criteria for the protection of freshwater aquatic life and the application of a dilution credit of 10:1 for the chronic criteria and 1:1 for the acute criteria. An AMEL and MDEL for selenium of 9.8 µg/L and 26 µg/L, respectively, are included in this Order based on based on the CTR criterion for the protection of freshwater aquatic life (See Attachment F, Table F-9 for WQBEL calculations). Based on recent effluent monitoring data, it appears the Discharger can meet this new limitation.

q. **Nitrate.** Nitrate is known to cause adverse health effects in humans. The California DHS has adopted Primary MCLs at Title 22 of the California Code of Regulations (CCR), Table 64431-A, for the protection of human health for nitrite and nitrate that are equal to 1 mg/L and 10 mg/L (measured as nitrogen), respectively. Title 22 CCR, Table 64431-A, also includes a primary MCL of 10,000 µg/L for the sum of nitrate and nitrite, measured as nitrogen.

   USEPA has developed a primary MCL and an MCL goal of 1,000 µg/L for nitrite (as nitrogen). For nitrate, USEPA has developed Drinking Water Standards (10,000 µg/L as Primary Maximum Contaminant Level) and Ambient Water Quality Criteria for protection of human health (10,000 µg/L for non-cancer health effects). Recent toxicity studies have indicated a possibility that nitrate is toxic to aquatic organisms.

   An AMEL for nitrate of 42 mg/L is included in this Order based on the MCL. A dilution credit 10:1 is allowed since the ambient monitoring data demonstrates the receiving water has assimilative capacity for nitrate. Based on the effluent monitoring data, it appears the Discharger can meet this new limitation.

r. **pH.** The Basin Plan includes a water quality objective for surface waters (except for Goose Lake) that the "…*pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses.*" Effluent Limitations for pH are included in this Order based on the Basin Plan objectives for pH.

s. **Salinity.** The discharge contains total dissolved solids (TDS), chloride, sulfate, and electrical conductivity (EC). These are water quality parameters that are indicative of the salinity of the water. Their presence in water can be growth

limiting to certain agricultural crops and can affect the taste of water for human consumption. There are no USEPA water quality criteria for the protection of aquatic organisms for these constituents. The Basin Plan contains a chemical constituent objective that incorporates State MCLs, contains a narrative objective, and contains numeric water quality objectives for EC, TDS, Sulfate, and Chloride.

Table F-4. Salinity Water Quality Criteria/Objectives

Parameter	Agricultural WQ Goal[1]	Secondary MCL[3]	Effluent	
			Avg	Max
EC (µmhos/cm)	Varies[2]	900, 1600, 2200	2473	3900
TDS (mg/L)	Varies	500, 1000, 1500	1754	2500
Sulfate (mg/L)	Varies	250, 500, 600	727	1100
Chloride (mg/L)[4]	Varies	250, 500, 600	410	790

1 Agricultural water quality goals based on *Water Quality for Agriculture*, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985)

2 The EC level in irrigation water that harms crop production depends on the crop type, soil type, irrigation methods, rainfall, and other factors. An EC level of 700 umhos/cm is generally considered to present no risk of salinity impacts to crops. However, many crops are grown successfully with higher salinities.

3 The secondary MCLs are stated as a recommended level, upper level, and a short-term maximum level.

4 See Basin Plan site-specific water quality objectives for chloride list below in subsection i.

i. **Chloride**. The secondary MCL for chloride is 250 mg/L, as recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum. The recommended agricultural water quality goal for chloride, that would apply the narrative chemical constituent objective, is 106 mg/L as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). The 106 mg/L water quality goal is intended to protect against adverse effects on sensitive crops when irrigated via sprinklers.

There are site-specific objectives in the Basin Plan for chloride at the Antioch Water Works Intake, located approximately 2 miles downstream from the GWF outfall, as follows:

- Maximum mean daily chloride concentration of 150 mg/L for at least the number of days shown during the Calendar Year. Must be provided in intervals of not less than two weeks duration (Percentage of Calendar Year shown in parenthesis)

Year Type	No. days each cal. Year < 150 mg/L Cl^-
Wet	240 (66%)
Above Normal	190 (52%)
Below Normal	175 (48%)
Dry	165 (45%)
Critical	155 (42%)

Chloride concentrations in the effluent ranged from 120 mg/L to 790 mg/L, with an average of 410 mg/L, for 74 samples collected by the Discharger from September 2002 through September 2006. Background concentrations in the San Joaquin River ranged from 11 mg/L to 620 mg/L, with an average of 133 mg/L, for 24 samples collected by the Discharger from September 2002 through September 2006. Both the receiving water and the effluent exceed the agricultural water quality goal of 106 mg/L.

ii. **Electrical Conductivity (EC)**. The secondary MCL for EC is 900 µmhos/cm as a recommended level, 1600 µmhos/cm as an upper level, and 2200 µmhos/cm as a short-term maximum. The agricultural water quality goal, that would apply the narrative chemical constituents objective, is 700 µmhos/cm as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). The 700 µmhos/cm agricultural water quality goal is intended to prevent reduction in crop yield, i.e. a restriction on use of water, for salt-sensitive crops, such as beans, carrots, turnips, and strawberries. These crops are either currently grown in the area or may be grown in the future. Most other crops can tolerate higher EC concentrations without harm, however, as the salinity of the irrigation water increases, more crops are potentially harmed by the EC, or extra measures must be taken by the farmer to minimize or eliminate any harmful impacts.

A review of the Discharger's monitoring reports from September 2002 through August 2006 shows an average effluent EC of 2500 µmhos/cm, with a range from 900 µmhos/cm to 3900 µmhos/cm for 105 samples. These levels exceed the applicable objectives. The background receiving water EC averaged 666 µmhos/cm, with a maximum value of 3100 mg/L in 24 sampling events collected by the Discharger from September 2002 through December 2006. These data show that the receiving water at times has no assimilative capacity for EC.

iii. **Sulfate**. The secondary MCL for sulfate is 250 mg/L as recommended level, 500 mg/L as an upper level, and 600 mg/L as a short-term maximum. Sulfate concentrations in the effluent ranged from 46 mg/L to 1100 mg/L, with an average of 727 mg/L, for 62 samples collected by the Discharger from September 2002 through September 2006. Background concentrations in the San Joaquin River ranged from 9.9 mg/L to 100 mg/L, with an average of 44 mg/L, for 10 samples collected by the Discharger from September 2002

through December 2006. The effluent exceeds the secondary MCL recommended level of 250 mg/L.

iv. **Total Dissolved Solids (TDS).** The secondary MCL for TDS is 500 mg/L as a recommended level, 1000 mg/L as an upper level, and 1500 mg/L as a short-term maximum. The recommended agricultural water quality goal for TDS, that would apply the narrative chemical constituent objective, is 450 mg/L as a long-term average based on Water Quality for Agriculture, Food and Agriculture Organization of the United Nations—Irrigation and Drainage Paper No. 29, Rev. 1 (R.S. Ayers and D.W. Westcot, Rome, 1985). Water Quality for Agriculture evaluates the impacts of salinity levels on crop tolerance and yield reduction, and establishes water quality goals that are protective of the agricultural uses. The 450 mg/L water quality goal is intended to prevent reduction in crop yield, i.e. a restriction on use of water, for salt-sensitive crops. Only the most salt sensitive crops require irrigation water of 450 mg/L or less to prevent loss of yield. Most other crops can tolerate higher TDS concentrations without harm, however, as the salinity of the irrigation water increases, more crops are potentially harmed by the TDS, or extra measures must be taken by the farmer to minimize or eliminate any harmful impacts.

The average TDS effluent concentration was 1769 mg/L and ranged from 900 mg/L to 2500 mg/L for 108 samples collected by the Discharger from September 2002 through September 2006. These concentrations exceed the applicable water quality objectives. The background receiving water TDS ranged from 87 mg/L to 2100 mg/L, with an average of 387 mg/L in 24 sampling events performed by the Discharger from September 2002 through September 2006. These data indicate the receiving water at times exceeds water quality objectives and lacks assimilative capacity for TDS.

v. **Salinity Effluent Limitations.** The City of Antioch's drinking water intake structure is about 2 miles downstream of the discharge. This intake is only utilized when the water quality of the San Joaquin River is of high quality, typically in late winter and early spring when the San Joaquin River flows are sufficiently high due to stormwater flow events and spring snow melt runoff. At other times of the year, the San Joaquin River in the Antioch area is a mixture of freshwater and saltwater (see Attachment H showing EC data for Antioch). During periods when the ambient salinity is below standards, the previous Order allowed a 2000 ft mixing zone, where dilution can reach a ratio of 100:1 based on the dilution study specified in the Fact Sheet (Attachment F) Section IV.C.2.c. Using a dilution credit of 100:1 results in an EC effluent limit of 5,450 µmhos/cm, a TDS effluent limit of 3,500 mg/L, a chloride effluent limit of 830 mg/L, and a sulfate effluent limit of 2,620 mg/L. However, based on past performance of the Facility, this Order includes more stringent performance-based effluent limitations for these salinity constituents (see Table F-5, below).

The effluent limitations for constituents indicative of salinity in this Order are based on the current Facility performance. In developing the performance-based effluent limitations, where there are ten sampling data points or more, sampling and laboratory variability is accounted for by establishing effluent limitations that are based on normally distributed data where 99.9% of the data points will lie within 3.3 standard deviations of the mean (*Basic Statistical Methods for Engineers and Scientists, Kennedy and Neville, Harper and Row*). Therefore, the salinity limitations in this Order are established as the mean plus 3.3 standard deviations of the available data. The statistics used to calculate the effluent limitations are provided in Table F-5.

Table F-5. Salinity Effluent Limitation Calculation Summary

Parameter	Units	MEC	Mean	Std. Dev.	# of Samples	Effluent Limitation
Electrical Conductivity	µmhos/cm	3900	2473	659	96	**4650**
Total Dissolved Solids	mg/L	2500	1754	455	108	**3255**
Sulfate	mg/L	1100	742	151	43	**1240**
Chloride	mg/L	790	415	194	72	**1060**

During periods when the salinity of the background receiving water exceeds the applicable water quality objectives, the previous Order required a receiving water limit that limited the increase of salinity to no more than 10% between RSW-001 and RSW-002. This requirement only was applied when the Mirant Delta Power Plant was not discharging, due to the close proximity and large volume of the Mirant discharge. This receiving water limitation has been carried forward from the previous Order. In addition, receiving water limits for chloride, in accordance with the Basin Plan site-specific objectives, have been included in this Order.

t. **Temperature**. The Thermal Plan requires that, "*The maximum temperature shall not exceed the natural receiving water temperature by more than 20°F.*" Therefore, to ensure compliance with the Thermal Plan an effluent limitation for temperature is included in this Order.

u. **Toxicity.** See Section IV.C.5. of the Fact Sheet regarding whole effluent toxicity.

4. WQBEL Calculations

a. Effluent limitations for aluminum, copper, cyanide, selenium, dibromochloromethane and ammonia were calculated in accordance with section 1.4 of the SIP. The following paragraphs describe the methodology used for calculating effluent limitations.

b. **Effluent Limitation Calculations.** In calculating maximum effluent limitations, the effluent concentration allowances were set equal to the criteria/standards/objectives.

$$ECA_{acute} = CMC \qquad ECA_{chronic} = CCC$$

For the human health, agriculture, or other long-term criterion/objective, a dilution credit can be applied. The ECA is calculated as follows:

$$ECA_{HH} = HH + D(HH - B)$$

where:

ECA_{acute} = effluent concentration allowance for acute (one-hour average) toxicity criterion

$ECA_{chronic}$ = effluent concentration allowance for chronic (four-day average) toxicity criterion

ECA_{HH} = effluent concentration allowance for human health, agriculture, or other long-term criterion/objective

CMC = criteria maximum concentration (one-hour average)

CCC = criteria continuous concentration (four-day average, unless otherwise noted)

HH = human health, agriculture, or other long-term criterion/objective

D = dilution credit

B = maximum receiving water concentration

Acute and chronic toxicity ECAs were then converted to equivalent long-term averages (LTA) using statistical multipliers and the lowest is used. Additional statistical multipliers were then used to calculate the maximum daily effluent limitation (MDEL) and the average monthly effluent limitation (AMEL).

Human health ECAs are set equal to the AMEL and a statistical multiplier is used to calculate the MDEL.

$$AMEL = mult_{AMEL}\left[\min\left(\overbrace{M_A ECA_{acute}}^{LTA_{acute}}, M_C ECA_{chronic}\right)\right]$$

$$MDEL = mult_{MDEL}\left[\min\left(M_A ECA_{acute}, \underbrace{M_C ECA_{chronic}}_{LTA_{chronic}}\right)\right]$$

$$MDEL_{HH} = \left(\frac{mult_{MDEL}}{mult_{AMEL}}\right) AMEL_{HH}$$

where: $mult_{AMEL}$ = statistical multiplier converting minimum LTA to AMEL
$mult_{MDEL}$ = statistical multiplier converting minimum LTA to MDEL
M_A = statistical multiplier converting CMC to LTA
M_C = statistical multiplier converting CCC to LTA

Water quality-based effluent limitations were calculated for aluminum, copper, cyanide, selenium and dibromochloromethane as follows in Tables F-6 through F-10, below:

Table F-6 WQBEL Calculations for Aluminium

	Acute	Chronic
Criteria (µg/L) [1]	750	87
Dilution Credit	No Dilution	No Dilution
ECA	750	87
ECA Multiplier	0.34	0.54
LTA	251	47
AMEL Multiplier (95th%)	(2)	1.5
AMEL (µg/L)	(2)	**72**
MDEL Multiplier (99th%)	(2)	3.0
MDEL (µg/L)	(2)	**141**

(1) USEPA Ambient Water Quality Criteria
(2) Limitations based on chronic LTA (Chronic LTA < Acute LTA)

Table F-7 WQBEL Calculations for Copper

	Acute	Chronic
Criteria, dissolved (µg/L) [1]	30.7	19
Dilution Credit	1:1	10:1
Translator [2]	0.96	0.96
ECA, total recoverable [3]	55	147
ECA Multiplier [4]	0.59	0.76
LTA	33	112
AMEL Multiplier (95th%) [5][6]	1.3	[8]
AMEL (µg/L)	41	[8]
MDEL Multiplier (99th%) [7]	1.9	[8]
MDEL (µg/L)	62	[8]

(1) CTR aquatic life criteria, based on a hardness of 109 mg/L as $CaCO_3$.
(2) EPA Translator used as default.
(3) ECA calculated per section 1.4.B, Step 2 of SIP. This allows for the consideration of dilution.
(4) Acute and Chronic ECA Multiplier calculated at 99th percentile per section 1.4.B, Step 3 of SIP or per sections 5.4.1 and 5.5.4 of the TSD.
(5) Assumes sampling frequency n=>4.
(6) The probability basis for AMEL is 95th percentile per section 1.4.B, Step 5 of SIP or section 5.5.4 of the TSD.
(7) The probability basis for MDEL is 99th percentile per section 1.4.B, Step 5 of SIP or section 5.5.4 of the TSD.
(8) Limitations based on acute LTA (Acute LTA < Chronic LTA)

Table F-8 WQBEL Calculations for Cyanide

	Acute	Chronic
Criteria (µg/L) [1]	22	5.2
Dilution Credit	1	10
ECA	43	47
ECA Multiplier	0.42	0.63
LTA	18.3	29.7
AMEL Multiplier (95th%)	1.4	(2)
AMEL (µg/L)	25	(2)
MDEL Multiplier (99th%)	2.4	(2)
MDEL (µg/L)	43	(2)

1 CTR aquatic life criteria
2 Limitations based on acute LTA (Acute LTA < Chronic LTA)

Table F-9 WQBEL Calculations for Selenium

	Acute	Chronic
Criteria (µg/L) [1]	20	5
Dilution Credit	1	10
ECA	20	5
ECA Multiplier	0.16	0.30
LTA	5.8	4.2
AMEL Multiplier (95th%)	(2)	2.2
AMEL (µg/L)	(2)	**9.3**
MDEL Multiplier (99th%)	(2)	6.2
MDEL (µg/L)	(2)	**26**

1 CTR aquatic life criteria
2 Limitations based on chronic LTA (Chronic LTA < Acute LTA)

Table F-10 WQBEL Calculations for Dibromochloromethane

		Human Health
Criteria (mg/L)		0.41
Dilution Credit		10:1
ECA		4.0
AMEL (µg/L) [1]		**4.0**
MDEL/AMEL Multiplier[2]		**2.01**
MDEL (µg/L)		**8.0**

(1) AMEL = ECA per section 1.4.B, Step 6 of SIP
(2) Assumes sampling frequency n<=4. Uses MDEL/AMEL multiplier from Table 2 of SIP.

Summary of Water Quality-based Effluent Limitations
Discharge Point 001

Table F-11. Summary of Water Quality-based Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
pH	standard units				6.5	8.5
Aluminum	µg/L	72		141		
Barium	µg/L			590		
Copper	µg/L	41		62		
Cyanide	µg/L	25		43		
Fluoride	mg/L			10		
Iron	µg/L			300		
Molybdenum	µg/L			49		
Selenium	µg/L	9.8		26		
	lbs/day[1]	0.005		0.027		
Dibromochloromethane	µg/L	4.0		8.0		
Nitrate	mg/L	42				
Electrical Conductivity	umhos/cm			4650		
Total Dissolved Solids	mg/L			3255		
Sulfate	mg/L			1240		
Chloride	mg/L			1060		

[1] Based on an average monthly flow of 60,758 gpd and a maximum daily flow of 125,000 gpd.

5. Whole Effluent Toxicity (WET)

For compliance with the Basin Plan's narrative toxicity objective, this Order requires the Discharger to conduct whole effluent toxicity testing for acute and chronic toxicity, as specified in the Monitoring and Reporting Program (Attachment E, Section V.). This Order also contains effluent limitations for acute toxicity and requires the Discharger to implement best management practices to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity.

a. **Acute Aquatic Toxicity.** The Basin Plan contains a narrative toxicity objective that states, "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at III-8.00) The Basin Plan also states that, "…*effluent limits based upon acute biotoxicity tests of effluents will be prescribed where appropriate*…". USEPA Region 9 provided guidance for the development of acute toxicity effluent limitations in the absence of numeric water quality objectives for toxicity in its document titled "Guidance for NPDES Permit Issuance", dated February 1994. In section B.2. "Toxicity Requirements" (pgs. 14-15) it states that, "*In the absence of specific numeric water quality objectives for acute and chronic toxicity, the narrative criterion 'no toxics in toxic amounts' applies. Achievement of the narrative criterion, as applied herein, means that*

ambient waters shall not demonstrate for acute toxicity: 1) less than 90% survival, 50% of the time, based on the monthly median, or 2) less than 70% survival, 10% of the time, based on any monthly median. For chronic toxicity, ambient waters shall not demonstrate a test result of greater than 1 TUc." Accordingly, effluent limitations for acute toxicity have been included in this Order as follows:

Acute Toxicity. Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than:

Minimum for any one bioassays ----------	70%
Median for any three or more consecutive bioassays ---------	90%

b. **Chronic Aquatic Toxicity.** Based on quarterly whole effluent chronic toxicity testing performed by the Discharger from October 2002 through April 2007, the discharge has reasonable potential to cause or contribute to an in-stream excursion above of the Basin Plan's narrative toxicity objective.

A dilution credit of 10:1 has been granted for the chronic condition. Chronic toxicity testing results exceeding 8 chronic toxicity units (TUc) demonstrates the discharge has a reasonable potential to cause or contribute to an exceedance of the Basin Plan's narrative toxicity objective.

Numeric chronic WET effluent limitations have not been included in this order. The SIP contains implementation gaps regarding the appropriate form and implementation of chronic toxicity limits. This has resulted in the petitioning of a NPDES permit in the Los Angeles Region[2] that contained numeric chronic toxicity effluent limitations. To address the petition, the State Water Board adopted WQO 2003-012 directing its staff to revise the toxicity control provisions in the SIP. The State Water Board states the following in WQO 2003-012*, "In reviewing this petition and receiving comments from numerous interested persons on the propriety of including numeric effluent limitations for chronic toxicity in NPDES permits for publicly-owned treatment works that discharge to inland waters, we have determined that this issue should be considered in a regulatory setting, in order to allow for full public discussion and deliberation. We intend to modify the SIP to specifically address the issue. We anticipate that review will occur within the next year. We therefore decline to make a determination here regarding the propriety of the final numeric effluent limitations for chronic toxicity contained in these permits."* The process to revise the SIP is currently underway. Proposed changes include clarifying the appropriate form of effluent toxicity limits in NPDES permits and general expansion and standardization of toxicity control implementation related to the NPDES

[2] In the Matter of the Review of Own Motion of Waste Discharge Requirements Order Nos. R4-2002-0121 [NPDES No. CA0054011] and R4-2002-0123 [NPDES NO. CA0055119] and Time Schedule Order Nos. R4-2002-0122 and R4-2002-0124 for Los Coyotes and Long Beach Wastewater Reclamation Plants Issued by the California Regional Water Quality Control Board, Los Angeles Region SWRCB/OCC FILES A-1496 AND 1496(a)

permitting process. Since the toxicity control provisions in the SIP are under revision it is infeasible to develop numeric effluent limitations for chronic toxicity. Therefore, this Order requires that the Discharger meet best management practices for compliance with the Basin Plan's narrative toxicity objective, as allowed under 40 CFR 122.44(k).

To ensure compliance with the Basin Plan's narrative toxicity objective, the Discharger is required to conduct chronic whole effluent toxicity testing, as specified in the Monitoring and Reporting Program (Attachment E, Section V.). Furthermore, Special Provisions VI.C.2.a. of this Order requires the Discharger to investigate the causes of, and identify and implement corrective actions to reduce or eliminate effluent toxicity. If the discharge demonstrates a pattern of toxicity exceeding the numeric toxicity monitoring trigger, the Discharger is required to initiate a Toxicity Reduction Evaluation (TRE), in accordance with an approved TRE work plan. The numeric toxicity monitoring trigger is not an effluent limitation, it is the toxicity threshold at which the Discharger is required to perform accelerated chronic toxicity monitoring, as well as, the threshold to initiate a TRE if a pattern of effluent toxicity has been demonstrated.

D. Final Effluent Limitations

1. Mass-based Effluent Limitations.

Title 40 CFR 122.45(f)(1) requires effluent limitations be expressed in terms of mass, with some exceptions, and 40 CFR 122.45(f)(2) allows pollutants that are limited in terms of mass to additionally be limited in terms of other units of measurement. This Order includes effluent limitations expressed in terms of mass and concentration. In addition, pursuant to the exceptions to mass limitations provided in 40 CFR 122.45(f)(1), some effluent limitations are not expressed in terms of mass, such as pH and temperature, and when the applicable standards are expressed in terms of concentration (e.g. CTR criteria and MCLs) and mass limitations are not necessary to protect the beneficial uses of the receiving water.

Mass-based effluent limitations were calculated by multiplying the concentration limitation by the Facility's maximum daily flow limitation and the appropriate conversion factor. Unless otherwise noted, all mass limitations or mass emission rates (MERs) in this Order were calculated using the maximum daily flow.

2. Averaging Periods for Effluent Limitations.

Title 40 CFR 122.45 (d) requires that 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 dischargers other than publicly owned treatment works (POTW). The Facility is not a POTW, therefore, these regulations are applicable.

3. Satisfaction of Anti-Backsliding Requirements.

Some effluent limitations in this Order are less stringent that those in the previous Order. As discussed below, this relaxation of effluent limitations is consistent with the anti-backsliding requirements of the CWA and federal regulations.

Order No. 2002-0155 includes effluent limitations for thallium, zinc, lead and nickel. Self-monitoring data submitted by the Discharger between September 2002 and September 2006 indicate that the effluent discharge does not have reasonable potential to cause or contribute to an instream excursion above the applicable water quality criteria for these constituents. This new information indicates that that water quality-based limits for these constituents can be removed from the current Order. The proposed Order includes copper limits that have been increased (less stringent) from the current Order based on using an effluent hardness (see section IV.C.2.b., above). The current Order sets variable copper effluent limits based on a table using the average of the effluent and upstream receiving water hardness. The previous Order also contained final effluent limitations for chromium and oil and grease. That Order incorrectly stated that those limitations were needed to comply with technology standards contained in 40 CFR Section 423. In actuality, the limitations for chromium and oil and grease in 40 CFR Section 423 apply to internal waste streams and have been included in their entirety in this Order. Removal of the effluent limitations for oil and grease, thallium, zinc, lead and nickel, chromium and relaxation of the copper limits from the current Order is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Resources Control Board Resolution 68-16. Any impact on existing water quality will be insignificant.

4. Satisfaction of Antidegradation Policy

Section 131.12 requires that the state water quality standards 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.

This Order does not allow for an increase in flow or mass of pollutants to the receiving water. Therefore, a complete antidegradation analysis is not necessary. The Order requires compliance with applicable federal technology-based standards and with water quality-based effluent limits (WQBELs) where the discharge could have the reasonable potential to cause or contribute to an exceedance of water quality standards.

This Order removes effluent limitations for certain constituents that monitoring data show they do not have reasonable potential to cause or contribute to an instream excursion above the applicable water quality criteria. However, as discussed in detail in Section IV.D.3. above, this Order is fully protective of the beneficial uses of

the receiving water and is in compliance with federal anti-backsliding regulations. The permitted discharge is consistent with the antidegradation provisions of 40 CFR 131.12 and State Water Board Resolution 68-16. Compliance with these requirements will result in the use of best practicable treatment or control of the discharge. The impact on existing water quality will be insignificant.

Summary of Final Effluent Limitations
Discharge Point EFF-001

Table F-12. Summary of Final Effluent Limitations

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum
Total Suspended Solids	mg/L	30	--	100	--	--
	lbs/day[1]	15.2	--	104.3	--	--
pH	standard units	--	--	--	6.5	8.5
Electrical Conductivity	µmhos/cm	--	--	4650	--	--
Oil and Grease	mg/L	15	--	20	--	--
Total Dissolved Solids	mg/L	--	--	3255	--	--
Aluminum	µg/L	72	--	141	--	--
Barium	µg/L	--	--	590	--	--
Chloride	mg/L	--	--	1060	--	--
Copper	µg/L	41	--	62	--	--
Cyanide	µg/L	25	--	43	--	--
Fluoride	mg/L	--	--	10	--	--
Iron	µg/L	--	--	300	--	--
Molybdenum	µg/L	--	--	49	--	--
Selenium	µg/L	9.8	--	26	--	--
	lbs/day[1]	0.005	--	0.027	--	--
Sulfate	mg/L	--	--	1240	--	--
Dibromochloromethane	µg/L	1.1	--	2.0	--	--
Nitrate	mg/L	42	--	--	--	--
Chromium[2, 6]	mg/L	0.2	--	0.2	--	--
Zinc[2, 6]	mg/L	1.0	--	1.0	--	--
Priority Pollutants[2, 6]	µg/L	ND[3]	--	ND[3]	--	--
Acute Toxicity[4]	% Survival	--	--	--	--	--
Temperature	ºF			86[5]		
Free Available Chlorine[6]	mg/L	0.2	--	0.5	--	--
Flow	gpd			125,000		

Parameter	Units	Effluent Limitations				
		Average Monthly	Average Weekly	Maximum Daily	Instantaneous Minimum	Instantaneous Maximum

[1] Based on an average daily flow of 60,748 gpd, and a maximum daily flow of 125,000 gpd.

[2] Limitation applies to chemicals added to cooling tower for maintenance. Compliance may be determined by engineering calculations which demonstrate that the regulated pollutants are not detectable in the final discharge by the analytical methods in 40 CFR Part 136

[3] ND indicates non-detect

[4] Survival of aquatic organisms in 96-hour bioassays of undiluted waste shall be no less than: 70%, minimum for any one bioassay; and 90%, median for any three consecutive bioassays.

[5] The maximum temperature of the discharge shall not exceed the natural receiving water temperature by more than 20ºF

[6] Chemicals added as corrosion inhibitors and biocides in the cooling tower shall not cause the effluent to exceed these effluent limits.

E. Land Discharge Specifications

The Facility includes a stormwater retention basin that collects stormwater from the Facility. No cooling water effluent is discharged to the retention basin. The Discharger may at times use the stormwater as make up water. This Order includes land discharge specifications to ensure protection of groundwater, prevent nuisance and odors, and to ensure the basin does not overflow to surface water.

1. The pH in the storm water basin shall not be less than 6.5 nor greater than 8.5.

2. The dissolved oxygen concentration of the storm water contained in the storm water basin shall not be less than 1.0 mg/l for 8 hours in any 24-hour period.

3. Two feet (2') of freeboard shall be maintained in the storm water basin at all times.

4. Storm water that is not used as cooling tower makeup water or for dust control shall remain within the designated disposal area at all times.

F. Reclamation Specifications – Not Applicable

V. RATIONALE FOR RECEIVING WATER LIMITATIONS

Basin Plan water quality objectives to protect the beneficial uses of surface water and groundwater include numeric objectives and narrative objectives, including objectives for chemical constituents, toxicity, and tastes and odors. The toxicity objective requires that surface water and groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, animals, or aquatic life. The chemical constituent objective requires that surface water and groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use or that exceed the maximum contaminant levels (MCLs) in Title 22, CCR. The tastes and odors objective states that surface water and groundwater shall not contain taste- or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses. The Basin Plan requires the application of the most stringent objective necessary to ensure that surface water and groundwater do not contain chemical constituents, toxic substances, radionuclides, or taste and odor producing substances in concentrations that

adversely affect domestic drinking water supply, agricultural supply, or any other beneficial use.

A. Surface Water

1. CWA section 303(a-c), requires states to adopt water quality standards, including criteria where they are necessary to protect beneficial uses. The Regional Water Board adopted water quality criteria as water quality objectives in the Basin Plan. The Basin Plan states that "*[t]he numerical and narrative water quality objectives define the least stringent standards that the Regional Board will apply to regional waters in order to protect the beneficial uses*." The Basin Plan includes numeric and narrative water quality objectives for various beneficial uses and water bodies. This Order contains Receiving Surface Water Limitations based on the Basin Plan numerical and narrative water quality objectives for biostimulatory substances, chemical constituents, color, dissolved oxygen, floating material, oil and grease, pH, pesticides, radioactivity, salinity, sediment, settleable material, suspended material, tastes and odors, temperature, toxicity, turbidity, and electrical conductivity.

   Numeric Basin Plan objectives for dissolved oxygen, pH, temperature, and turbidity are applicable to this discharge and have been incorporated as Receiving Surface Water Limitations. Rational for these numeric receiving surface water limitations are as follows:

   a. **Biostimulatory Substances**. The Basin Plan includes a water quality objective that "*[W]ater shall not contain biostimulatory substances which promote aquatic growths in concentrations that cause nuisance or adversely affect beneficial uses."* Receiving Water Limitations for biostimulatory substances are included in this Order and are based on the Basin Plan objective.

   b. **Color**. The Basin Plan includes a water quality objective that "*[W]ater shall be free of discoloration that causes nuisance or adversely affects beneficial uses."* Receiving Water Limitations for color are included in this Order and are based on the Basin Plan objective.

   c. **Chemical Constituents**. The Basin Plan includes a water quality objective that *"[W]aters shall not contain chemical constituents in concentrations that adversely affect beneficial uses."* Receiving Water Limitations for chemical constituents are included in this Order and are based on the Basin Plan objective.

   d. **Dissolved Oxygen.** The Basin Plan includes a water quality objective that "*[W]ithin the legal boundaries of the Delta, the dissolved oxygen concentrations shall not be reduced below: 7.0 mg/L in the Sacramento River (below the I Street Bridge) and in all Delta waters west of the Antioch Bridge".* This Facilities discharges into Delta waters west of the Antioch Bridge. Numeric Receiving Water Limitations for dissolved oxygen are included in this Order and are based on the Basin Plan objective.

e. **Floating Material**. The Basin Plan includes a water quality objective that *"[W]ater shall not contain floating material in amounts that cause nuisance or adversely affect beneficial uses."* Receiving Water Limitations for floating material are included in this Order and are based on the Basin Plan objective.

f. **Oil and Grease**. The Basin Plan includes a water quality objective that *"[W]aters shall not contain oils, greases, waxes, or other materials in concentrations that cause nuisance, result in a visible film or coating on the surface of the water or on objects in the water, or otherwise adversely affect beneficial uses."* Receiving Water Limitations for oil and grease are included in this Order and are based on the Basin Plan objective.

g. **pH.** The Basin Plan includes water quality objective that *"[T]he pH shall not be depressed below 6.5 nor raised above 8.5. Changes in normal ambient pH levels shall not exceed 0.5 in fresh waters with designated COLD or WARM beneficial uses*" This Order includes receiving water limitations for both pH range and pH change.

   The Basin Plan allows an appropriate averaging period for pH change in the receiving stream. Since there is no technical information available that indicates that aquatic organisms are adversely affected by shifts in pH within the 6.5 to 8.5 range, an averaging period is considered appropriate and a monthly averaging period for determining compliance with the 0.5 receiving water pH limitation is included in this Order.

h. **Pesticides**. The Basin Plan includes a water quality objective for pesticides beginning on page III-6.00. Receiving Water Limitations for pesticides are included in this Order and are based on the Basin Plan objective.

i. **Radioactivity**. The Basin Plan includes a water quality objective that *"[R]adionuclides shall not be present in concentrations that are harmful to human, plant, animal or aquatic life nor that result in the accumulation of radionuclides in the food web to an extent that presents a hazard to human, plant, animal or aquatic life."* The Basin Plan states further that *"[A]t a minimum, waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of radionuclides in excess of the maximum contaminant levels (MCLs) specified in Table 4 (MCL Radioactivity) of Section 64443 of Title 22 of the California Code of Regulations…"* Receiving Water Limitations for radioactivity are included in this Order and are based on the Basin Plan objective.

j. **Sediment.** The Basin Plan includes a water quality objective that *"[T]he suspended sediment load and suspended sediment discharge rate of surface waters shall not be altered in such a manner as to cause nuisance or adversely affect beneficial uses"* Receiving Water Limitations for suspended sediments are included in this Order and are based on the Basin Plan objective.

k. **Settleable Material.** The Basin Plan includes a water quality objective that *"[W]aters shall not contain substances in concentrations that result in the deposition of material that causes nuisance or adversely affects beneficial uses."* Receiving Water Limitations for settleable material are included in this Order and are based on the Basin Plan objective.

l. **Suspended Material.** The Basin Plan includes a water quality objective that *"[W]aters shall not contain suspended material in concentrations that cause nuisance or adversely affect beneficial uses."* Receiving Water Limitations for suspended material are included in this Order and are based on the Basin Plan objective.

m. **Taste and Odors**. The Basin Plan includes a water quality objective that *"[W]ater shall not contain taste- or odor-producing substances in concentrations that impart undesirable tastes or odors to domestic or municipal water supplies or to fish flesh or other edible products of aquatic origin, or that cause nuisance, or otherwise adversely affect beneficial uses."* Receiving Water Limitations for taste- or odor-producing substances are included in this Order and are based on the Basin Plan objective.

n. **Temperature.** The Thermal Plan is applicable to this discharge. The Thermal Plan requires that the discharge shall not cause the following in the San Joaquin River:

   i. The creation of a zone, defined by water temperatures of more than 1°F above natural receiving water temperature, which exceeds 25 percent of the cross-sectional area of the river channel at any point.

   ii. A surface water temperature rise greater than 4°F above the natural temperature of the receiving water at any time or place.

   Receiving Water Limitations for temperature are included in this Order and are based on the Thermal Plan requirements.

o. **Toxicity**. The Basin Plan includes a water quality objective that *"[A]ll waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life."* Receiving Water Limitations for toxicity are included in this Order and are based on the Basin Plan objective.

p. **Turbidity.** The Basin Plan includes a water quality objective that "*[I]ncreases in turbidity attributable to controllable water quality factors shall not exceed the following limits:*

   - *Where natural turbidity is between 0 and 5 Nephelometric Turbidity Units (NTUs), increases shall not exceed 1 NTU.*
   - *Where natural turbidity is between 5 and 50 NTUs, increases shall not exceed 20 percent.*

- *Where natural turbidity is between 50 and 100 NTUs, increases shall not exceed 10 NTUs.*
- *Where natural turbidity is greater than 100 NTUs, increases shall not exceed 10 percent*."

A numeric Receiving Surface Water Limitation for turbidity is included in this Order and is based on the Basin Plan objective for turbidity.

q. **Salinity**. Numeric Receiving Surface Water Limitations for chloride are included in this order based on the site-specific water quality objectives for the Antioch Water Intake contained in the Basin Plan. Furthermore, during periods when the salinity of the background receiving water exceeds the applicable water quality objectives, this Order requires a receiving water limit that limits the increase of salinity to no more than 10% between RSW-001 and RSW-003. This requirement is only applied when the Mirant Delta Power Plant is not discharging, due to the close proximity and large volume of the Mirant discharge.

B. Groundwater

The Facility includes a stormwater retention basin that collects stormwater from the Facility. No cooling water effluent is discharged to the retention basin. The Discharger may at times use the stormwater as make up water.

1. The beneficial uses of the underlying ground water are municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply.

2. Groundwater limitations are required to protect the beneficial uses of the underlying groundwater.

VI. RATIONALE FOR MONITORING AND REPORTING REQUIREMENTS

Section 122.48 requires that all NPDES permits specify requirements for recording and reporting monitoring results. Water Code sections 13267 and 13383 authorizes the Regional Water Board to require technical and monitoring reports. The Monitoring and Reporting Program (MRP), Attachment E of this Order, establishes monitoring and reporting requirements to implement federal and state requirements. The following provides the rationale for the monitoring and reporting requirements contained in the MRP for this facility.

A. Influent Monitoring – Not Applicable

B. Effluent Monitoring

1. Pursuant to the requirements of 40 CFR §122.44(i)(2) effluent monitoring is required for all constituents with effluent limitations. Effluent monitoring is necessary to assess compliance with effluent limitations, assess the effectiveness of the treatment process, and to assess the impacts of the discharge on the receiving

water.

The Discharger does not use chlorine at the Facility, but rather uses a bromine based microbiocide to maintain the cooling towers. The EPA approved analytical method, or any other method performed by commercial laboratories, cannot differentiate between total residual chlorine and total residual bromine. Therefore, since chlorine is not used at the Facility, chlorine residual monitoring is conditionally waived (monitoring is required when and if chlorine is used in the future). The authority to waive monitoring for a constituent with technology based effluent limitations is contained in 40 CFR 122.44(a)(2).

C. Whole Effluent Toxicity Testing Requirements

1. **Acute Toxicity.** Quarterly 96-hour bioassay testing is required to demonstrate compliance with the effluent limitation for acute toxicity.
2. **Chronic Toxicity.** Semi-annual (even years in July and October, odd years in January and April) chronic whole effluent toxicity testing is required in order to demonstrate compliance with the Basin Plan's narrative toxicity objective.

D. Land Discharge Monitoring

1. Monitoring of the stormwater basin freeboard is necessary to assure that no discharge occurs to surface waters from the basin.

E. Receiving Water Monitoring

1. Surface Water

a. Receiving water monitoring is necessary to assess compliance with receiving water limitations and to assess the impacts of the discharge on the receiving stream.

2. Groundwater – Not Applicable

F. Other Monitoring Requirements

1. Municipal Water Supply Monitoring

a. Monitoring of the municipal water supply is necessary to assess the contribution made to pollutants in the effluent from the water supply utilized at the facility.

VII. RATIONALE FOR PROVISIONS

A. Standard Provisions

Standard Provisions, which apply to all NPDES permits in accordance with section 122.41, and additional conditions applicable to specified categories of permits in accordance with section 122.42, are provided in Attachment D. The discharger must

comply with all standard provisions and with those additional conditions that are applicable under section 122.42.

Section 122.41(a)(1) and (b) through (n) establish conditions that apply to all State-issued NPDES permits. These conditions must be incorporated into the permits either expressly or by reference. If incorporated by reference, a specific citation to the regulations must be included in the Order. Section 123.25(a)(12) allows the state to omit or modify conditions to impose more stringent requirements. In accordance with section 123.25, this Order omits federal conditions that address enforcement authority specified in sections 122.41(j)(5) and (k)(2) because the enforcement authority under the Water Code is more stringent. In lieu of these conditions, this Order incorporates by reference Water Code section 13387(e).

B. Special Provisions

1. Reopener Provisions

a. **Whole Effluent Toxicity.** This Order requires the Discharger to investigate the causes of, and identify corrective actions to reduce or eliminate effluent toxicity through a Toxicity Reduction Evaluation (TRE). This Order may be reopened to include a numeric chronic toxicity limitation, a new acute toxicity limitation, and/or a limitation for a specific toxicant identified in the TRE. Additionally, if a numeric chronic toxicity water quality objective is adopted by the State Water Board, this Order may be reopened to include a numeric chronic toxicity limitation based on that objective.

b. **Water Effects Ratio (WER) and Metal Translators.** A default WER of 1.0 has been used in this Order for calculating CTR criteria for applicable priority pollutant inorganic constituents. In addition, default dissolved-to-total metal translators have been used to convert water quality objectives from dissolved to total recoverable when developing effluent limitations for copper. If the Discharger performs studies to determine site-specific WERs and/or site-specific dissolved-to-total metal translators, this Order may be reopened to modify the effluent limitations for the applicable inorganic constituents.

2. Special Studies and Additional Monitoring Requirements

a. **Chronic Whole Effluent Toxicity Requirements.** The Basin Plan contains a narrative toxicity objective that states, "*All waters shall be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life.*" (Basin Plan at III-8.00.) Based on quarterly whole effluent chronic toxicity testing performed by the Discharger from December 2003 through April 2007, the discharge has reasonable potential to cause or contribute to an to an in-stream excursion above of the Basin Plan's narrative toxicity objective.

This provision requires the Discharger to develop a Toxicity Reduction Evaluation (TRE) Work Plan in accordance with EPA guidance. In addition, the provision provides a numeric toxicity monitoring trigger and requirements for accelerated monitoring, as well as, requirements for TRE initiation if a pattern of toxicity has been demonstrated.

Monitoring Trigger. A numeric toxicity monitoring trigger of > 8 TUc (where TUc = 100/NOEC) is applied in the provision, because this Order allows dilution for the chronic condition. Therefore, a TRE is triggered when the effluent exhibits a pattern of toxicity at 12.5% effluent.

Accelerated Monitoring. The provision requires accelerated WET testing when a regular WET test result exceeds the monitoring trigger. The purpose of accelerated monitoring is to determine, in an expedient manner, whether there is a pattern of toxicity before requiring the implementation of a TRE. Due to possible seasonality of the toxicity, the accelerated monitoring should be performed in a timely manner, preferably taking no more than 2 to 3 months to complete.

The provision requires accelerated monitoring consisting of four chronic toxicity tests in a 6 week period (i.e. one every two weeks) using the species that exhibited toxicity. Guidance regarding accelerated monitoring and TRE initiation is provided in the *Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991* (TSD). The TSD at page 118 states, "EPA recommends if toxicity is repeatedly or periodically present at levels above effluent limits more than 20 percent of the time, a TRE should be required." Therefore, four accelerated monitoring tests are required in this provision. If no toxicity is demonstrated in the four accelerated tests, then it demonstrates that toxicity is not present at levels above the monitoring trigger more than 20 percent of the time (only 1 of 5 tests are toxic, including the initial test). However, notwithstanding the accelerated monitoring results, if there is adequate evidence of a pattern of effluent toxicity (i.e. toxicity present exceeding the monitoring trigger more than 20 percent of the time), the Executive Officer may require that the Discharger initiate a TRE.

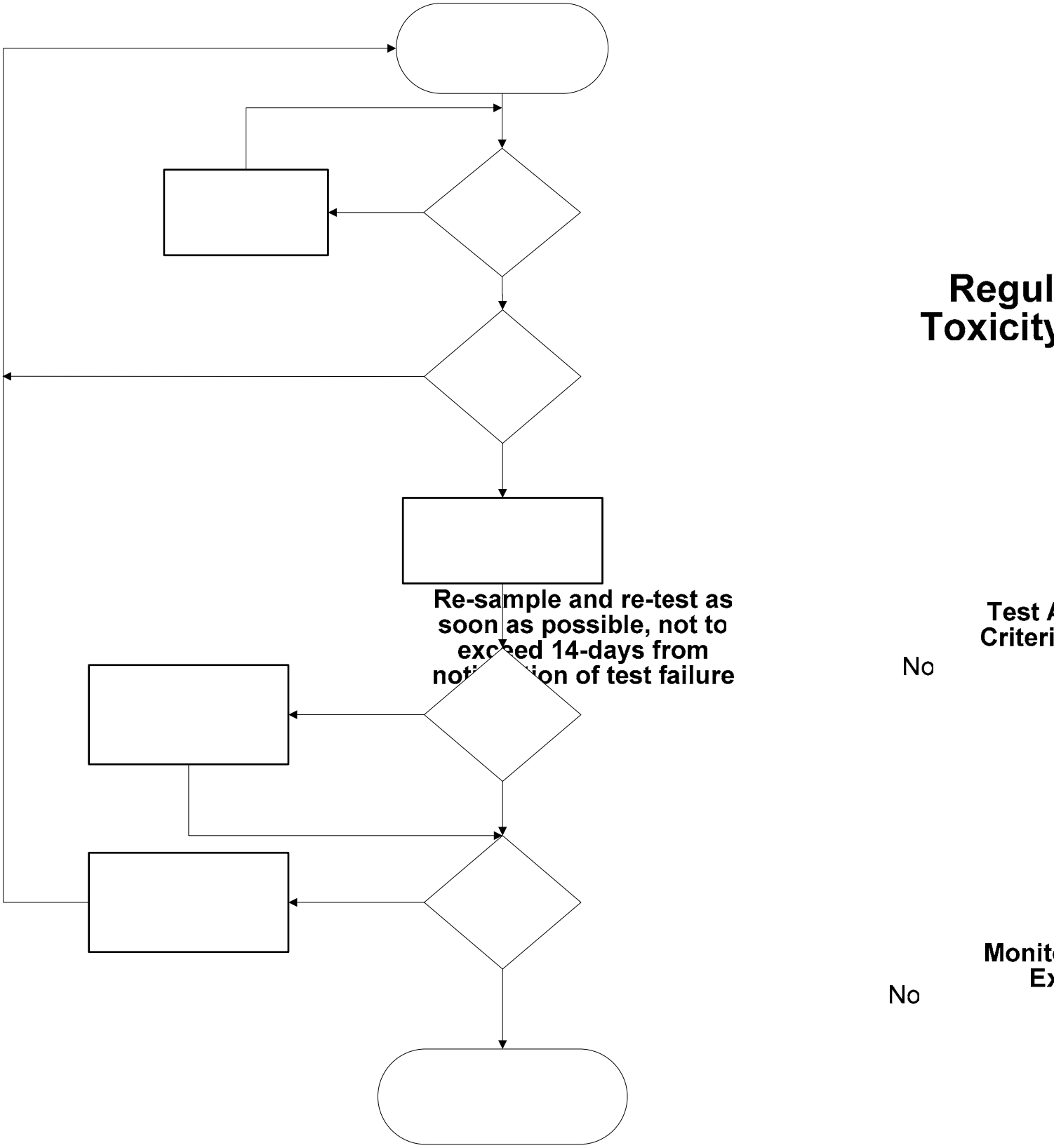
See the WET Accelerated Monitoring Flow Chart (Figure F-X), below, for further clarification of the accelerated monitoring requirements and for the decision points for determining the need for TRE initiation.

TRE Guidance. The Discharger is required to prepare a TRE Work Plan in accordance with USEPA guidance. Numerous guidance documents are available, as identified below:

- *Toxicity Reduction Evaluation Guidance for Municipal Wastewater Treatment Plants,* (EPA/833B-99/002), August 1999.
- Generalized Methodology for Conducting Industrial TREs*, (EPA/600/2-88/070), April 1989.*

- *Methods for Aquatic Toxicity Identification Evaluations: Phase I Toxicity Characterization Procedures,* Second Edition, EPA 600/6-91/005F, February 1991.
- *Toxicity Identification Evaluation: Characterization of Chronically Toxic Effluents, Phase I*, EPA 600/6-91/005F, May 1992.
- *Methods for Aquatic Toxicity Identification Evaluations: Phase II Toxicity Identification Procedures for Samples Exhibiting acute and Chronic Toxicity,* Second Edition, EPA 600/R-92/080, September 1993.
- *Methods for Aquatic Toxicity Identification Evaluations: Phase III Toxicity Confirmation Procedures for Samples Exhibiting Acute and Chronic Toxicity*, Second Edition, EPA 600/R-92/081, September 1993.
- *Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms*, Fifth Edition, EPA-821-R-02-012, October 2002.
- *Short-term Methods for Estimating the Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms*, Fourth Edition, EPA-821-R-02-013, October 2002.
- *Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, March 1991*

Figure F-3
WET Accelerated Monitoring Flow Chart



3. Best Management Practices and Pollution Prevention

a. **Salinity Evaluation and Minimization Plan.** In an effort to reduce salinity discharges to the San Joaquin River, the Discharger shall develop and implement a salinity evaluation and minimization plan. The plan shall identify best management practices to limit the salinity of the discharge.

4. Construction, Operation, and Maintenance Specifications – Not Applicable

5. Special Provisions for Municipal Facilities (POTWs Only) – Not Applicable

6. Other Special Provisions

The purpose of this provision is that in the event of any change in control or ownership of facilities presently owned or controlled by the Discharger, the Discharger shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be immediately forwarded to the Regional Water Board.

7. Compliance Schedules – Not Applicable

VIII. PUBLIC PARTICIPATION

The California Regional Water Quality Control Board, Central Valley Region (Regional Water Board) is considering the issuance of waste discharge requirements (WDRs) that will serve as a National Pollutant Discharge Elimination System (NPDES) permit for GWF Power Systems, L.P. Wilbur Avenue East Power Plant (Site IV). As a step in the WDR adoption process, the Regional Water Board staff has developed tentative WDRs. The Regional Water Board encourages public participation in the WDR adoption process.

A. Notification of Interested Parties

The Regional Water Board has notified the Discharger and interested agencies and persons of its intent to prescribe waste discharge requirements for the discharge and has provided them with an opportunity to submit their written comments and recommendations. Notification was provided through mailing to known interested persons and posting of a notice of public hearing as required by the federal regulations.

B. Written Comments

The staff determinations are tentative. Interested persons are invited to submit written comments concerning these tentative WDRs. Comments must be submitted either in person or by mail to the Executive Office at the Regional Water Board at the address above on the cover page of this Order.

To be fully responded to by staff and considered by the Regional Water Board, written comments should be received at the Regional Water Board offices by 12:00 p.m. on 5 December 2007.

C. Public Hearing

The Regional Water Board will hold a public hearing on the tentative WDRs during its regular Board meeting on the following date and time and at the following location:

Date: 24/25 January 2008
Time: 8:30 am
Location: Regional Water Quality Control Board, Central Valley Region
11020 Sun Center Dr., Suite #200
Rancho Cordova, CA 95670

Interested persons are invited to attend. At the public hearing, the Regional Water Board will hear testimony, if any, pertinent to the discharge, WDRs, and permit. Oral testimony will be heard; however, for accuracy of the record, important testimony should be in writing.

Please be aware that dates and venues may change. Our Web address is http://www.waterboards.ca.gov/rwqcb5/ where you can access the current agenda for changes in dates and locations.

D. Waste Discharge Requirements Petitions

Any aggrieved person may petition the State Water Resources Control Board to review the decision of the Regional Water Board regarding the final WDRs. The petition must be submitted within 30 days of the Regional Water Board's action to the following address:

State Water Resources Control Board
Office of Chief Counsel
P.O. Box 100, 1001 I Street
Sacramento, CA 95812-0100

E. Information and Copying

The Report of Waste Discharge (RWD), related documents, tentative effluent limitations and special provisions, comments received, and other information are on file and may be inspected at the address above at any time between 8:30 a.m. and 4:45 p.m., Monday through Friday. Copying of documents may be arranged through the Regional Water Board by calling Mr. James Marshall at (916) 464-4772.

F. Register of Interested Persons

Any person interested in being placed on the mailing list for information regarding the WDRs and NPDES permit should contact the Regional Water Board, reference this facility, and provide a name, address, and phone number.

G. Additional Information

Requests for additional information or questions regarding this order should be directed to Mr. James Marshall (916) 464-4772.