



**GWF POWER SYSTEMS**

November 30, 2007

Mr. Jim Marshall  
California Regional Water Quality Control Board  
Central Valley Region  
11020 Sun Center Drive #200  
Rancho Cordova, CA 95670-6114

**RE: Comments on Tentative NPDES Permit No. CA 0082309  
GWF Power Systems, Site 4**

Dear Mr. Marshall:

GWF has reviewed the Tentative NPDES Permit for our Wilbur Avenue East Power Plant ("Site IV") in Antioch (Permit No. CA 0082309). Our comments are minor and intended to provide document consistency and/or clarification and are provided in Attachment I for your review and consideration. Original text is in red strikeout font while the requested changes are in blue font. We trust that these minor corrections will not impact the final draft of the Order to be heard at the Board meeting in January.

If you need additional information to support GWF's comments please feel free to contact either Neftali Nevarez at (925) 431-1445 or myself at (925) 431-1440.

Respectfully,

A handwritten signature in blue ink, appearing to read 'Mark Kehoe'.

Mark Kehoe  
Director, Environmental and Safety Programs

Enclosure: Attachment I

cc. R. Vogler, GWF Site 4

# Attachment I

## II. FINDINGS

**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 filters 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.

## ATTACHMENT F - FACT SHEET

### II. Facility Description

The facility generates up to ~~18.5~~ 19.2 megawatts of net electrical power from the burning of petroleum coke as its primary fuel.

#### A. Description of Wastewater and Biosolids Treatment or Controls

2. 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.

#### **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' 2612" North Latitude, 121° 45' 1226" West Longitude, within the Sacramento-San Joaquin Delta.

#### **E. Planned Changes**

The Discharger ~~is in the process of installing~~ installed a treatment system to remove metals from the effluent that includes a membrane filter for solids removal, an activated carbon filter and/or ion exchange resin or equivalent media.

### **IV. Rationale For Effluent Limitations and Discharge Specifications**

#### **B. Technology-Based Effluent Limitations**

##### **2. Applicable Technology-Based Effluent Limitation**

- eb. Discharge Flow Limitations.** The Average Daily Flow Limitation of 60,748 gallons per day to calculate mass limits for Total Suspended Solids and selenium is based on the current plant performance and was determined as the average discharge flow released from the facility over the past three 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)

### 3. Determining the Need for WQBELs

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<sub>3</sub>. 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 7572 µg/L and 146141 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 Order allows the use of the alternate aluminum testing protocol described above to meet monitoring requirements.

s. Salinity.

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  $\mu\text{mhos/cm}$ , 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.

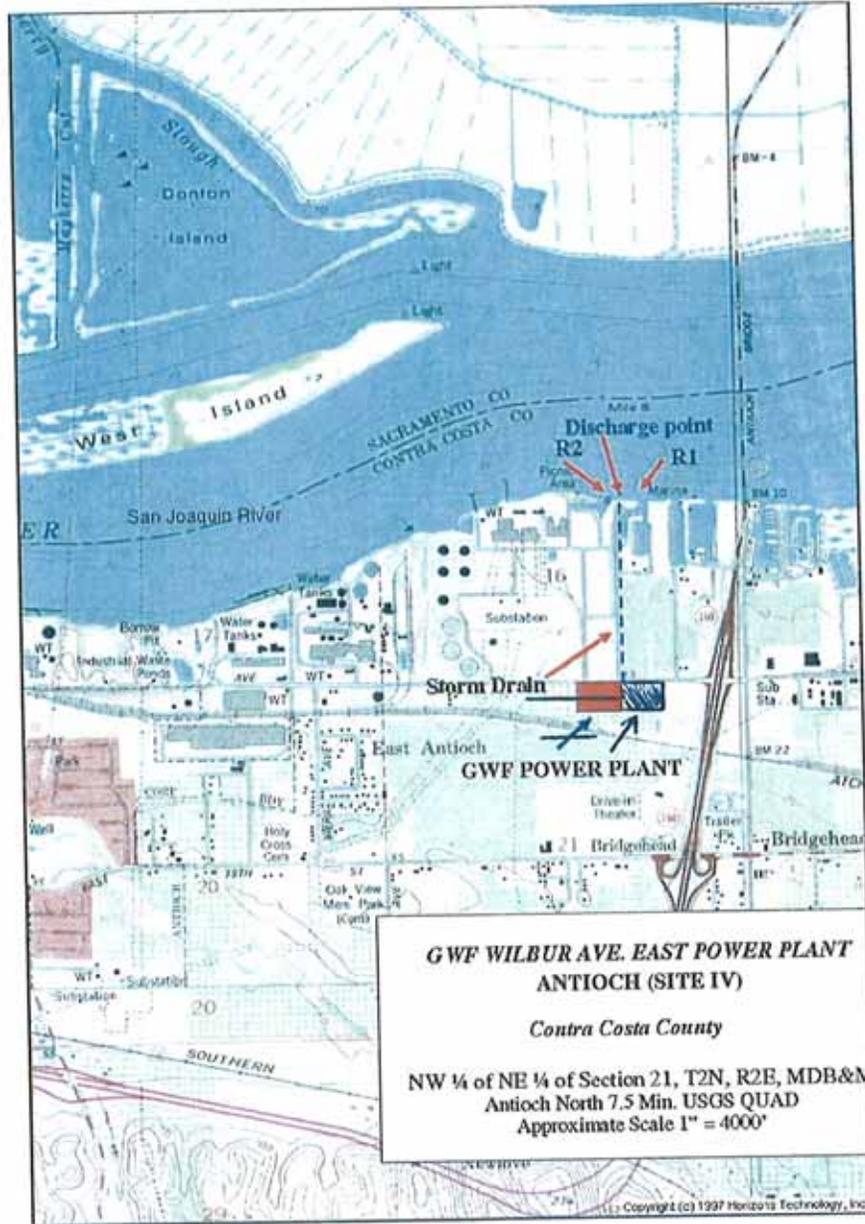
**Table F-5. Salinity Effluent Limitation Calculation Summary**

Parameter	Units	MEC	Mean	Std. Dev.	# of Samples	Effluent Limitation
Electrical Conductivity	$\mu\text{mhos/cm}$	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-0032. 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.

**ATTACHMENT B – MAP**



Attachment B –Map

Move the facility location to the East side of the storm drain as indicated on the map by the new arrow. Please note the strikethrough on the facility and arrow of the original location to be deleted