

STATE OF CALIFORNIA
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION

STAFF SUMMARY REPORT (Bill Johnson)
MEETING DATE: July 12, 2006

ITEM 5A

SUBJECT: **Fairfield-Suisun Sewer District, Wastewater Treatment Plant, Fairfield, Solano County** - Amendment of NPDES Permit, Order No. R2-2003-0072

CHRONOLOGY: August 2003 – NPDES permit reissued

DISCUSSION: The Fairfield-Suisun Sewer District discharges advanced-treated effluent from its wastewater treatment to Boynton Slough in Suisun Marsh in accordance with its permit. This Tentative Order amends the District's permit to allow the District to increase its dry weather discharge flows by 6.2 million gallons per day (mgd), and to use a new outfall located on nearby Ledgewood Creek.

This Tentative Order will allow the District to increase its existing discharge from 17.5 mgd to up to 23.7 mgd. This increase is necessary to accommodate future growth in the area. Although most of the discharge will typically flow from the existing Boynton Slough outfall, the ability to discharge to Ledgewood Creek will allow for maintenance of the Boynton Slough outfall, seismic redundancy, and increased wet weather capacity for future flows.

Although there will be an increase in flow, studies predict that there will be no water quality degradation and all water quality standards will be met. Also, no increase in mercury discharges will be allowed because of the permit's performance-based limits.

We received no written comments regarding this Tentative Order.

**RECOMMEN-
DATION:** Adopt the Tentative Order

FILE NUMBER: 2129.2005

APPENDICES: A. Tentative Order
B. Fact Sheet

APPENDIX A

Tentative Order

**CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
SAN FRANCISCO BAY REGION**

**ORDER R2-2006-XXXX
NPDES PERMIT NO. CA0038024**

**AMENDMENT OF WASTE DISCHARGE REQUIREMENTS, ORDER NO. R2-2003-0072,
FOR:**

**FAIRFIELD-SUISUN SEWER DISTRICT
FAIRFIELD, SOLANO COUNTY**

The California Regional Water Quality Control Board, San Francisco Bay Region (hereinafter the "Board"), finds that:

1. On August 20, 2003, the Board reissued Fairfield-Suisun Sewer District (hereinafter the "Discharger") waste discharge requirements in NPDES permit Order No. R2-2003-0072, which authorizes the Discharger to discharge advanced-treated effluent from its Wastewater Treatment Facility to Boynton Slough in Suisun Marsh under specified conditions.
2. This Order amends Order No. R2-2003-0072 to add provisions to allow an increase in dry weather discharge from 17.5 million gallons per day (mgd) to 23.7 mgd and to allow discharge to LedgeWood Creek through a separate outfall.

Discharge Description

3. The Discharger owns the Fairfield-Suisun Wastewater Treatment Plant (hereinafter the "Plant"), located at 1010 Chadbourne Road, Fairfield, Solano County, California. The Plant provides tertiary treatment of wastewater from domestic, commercial, and industrial sources within the City of Fairfield, City of Suisun City, and, by contract, some unincorporated properties in Solano County. As of 2005, the Discharger's service area has a population of approximately 130,000.

The Plant has an average dry weather flow (ADWF) design capacity of 17.5 mgd and can treat up to approximately 34.8 mgd during wet weather. As of 2005, the Plant treats an annual average influent flow of 17.5 mgd, with an average dry weather influent flow of 15.2 mgd. Of the total flow treated, an annual average of 15.9 mgd is discharged, with 1.60 mgd reclaimed for agricultural irrigation.

In 2001, the Discharger prepared a Sewer System and Treatment Plant Master Plan update. The Master Plan update concluded that a treatment plant expansion is needed to accommodate future growth within the Discharger's service area. The Discharger has completed additional engineering analyses and an Environmental Impact Report for the construction of facilities to increase treatment capacity to fully treat average dry weather flows up to 23.7 mgd. Those studies also address construction of a new outfall to LedgeWood Creek to provide for maintenance of the existing Boynton Slough outfall, seismic redundancy, and increased wet weather capacity to accommodate future flows. The construction of the additional treatment facilities and outfall are to be completed in approximately 2008.

Purpose of Order

4. This Order amends NPDES Permit No. CA 0038024, Order No. R2-2003-0072, and does the following:
 - a. Revises the discharge description to address the future treatment facilities needed for a capacity of 23.7 mgd and the future outfall facilities to convey the effluent to Ledgewood Creek for discharge;
 - b. Describes how the two outfalls discharging to Boynton Slough and Ledgewood Creek will be operated;
 - c. Permits the new Ledgewood Creek outfall;
 - d. Describes the future treatment process under the 23.7 mgd expansion;
 - e. Describes the beneficial uses of Ledgewood Creek, its salinity and hardness, and appropriate effluent limitations;
 - f. Revises the antidegradation/antibacksliding discussion to address an antidegradation analysis for the increase in discharge to 23.7 mgd; and
 - g. Modifies Discharge Prohibition A.4 to include language describing the conditions upon which the Discharger will be allowed to increase to a dry weather discharge rate of 23.7 mgd.

CEQA and Public Notice of Action

5. This Order serves as an amendment to NPDES Permit No. CA0038024, adoption of which is exempt from the provisions of Section 21100 et seq. of the Public Resources Code (California Environmental Quality Act) pursuant to Section 13389 of the California Water Code.
6. The Discharger and interested agencies and persons have been notified of the Board's intent to amend the waste discharge requirements for the existing discharge and have been provided an opportunity to submit their comments in writing. The Board's responses to comments are hereby incorporated by reference.
7. The Board, in a public meeting, heard and considered all comments pertaining to the discharge.

IT IS HEREBY ORDERED, pursuant to the provisions of Division 7 of the California Water Code and regulations adopted thereunder, and to the provisions of the Clean Water Act and regulations and guidelines adopted thereunder, that the Discharger shall comply with Order No. R2-2003-0072 as amended. To distinguish the original language contained in Order No. R2-2003-0072 from this Order, all the amendments are highlighted by underline for additions and ~~strike through~~ for deletions. References to attachments refer to Order No. R2-2003-0072 attachments.

1. Replace Finding 5 with the following:

5. The Plant has an average dry weather flow design capacity of 17.5 million gallons per day (mgd) and can treat up to approximately 34.8 mgd during wet weather. The As of 2005, the Plant presently treats an annual average influent flow of 16.4 17.5 mgd (2000-2002), with an average dry weather influent flow of 14.4 15.2 mgd (2000-2002). Of the total flow treated, an annual average of 14.4 15.9 mgd ~~is~~ was discharged, with 1.7 1.6 mgd reclaimed for agricultural irrigation. A map showing the location of the Plant is included as Attachment A.

In 2001, the Discharger prepared a Sewer System and Treatment Plant Master Plan update. The Master Plan update concluded that a treatment plant expansion is needed to accommodate future growth within the Discharger's service area. The Discharger has completed additional

engineering analyses and an Environmental Impact Report for the construction of facilities to increase treatment capacity to fully treat average dry weather flows up to 23.7 mgd. Those studies also address construction of a new outfall to Ledgewood Creek to provide for maintenance of the existing Boynton Slough outfall, seismic redundancy, and increased wet weather capacity to accommodate future flows. The construction of the additional treatment facilities and outfall are to be completed in approximately 2008.

2. Replace Finding 6 with the following:

6. Approximately 90% of the treated effluent is discharged to the Boynton Slough Outfall (E-001). Treated effluent is also discharged intermittently from turnouts located on the Boynton Slough Outfall pipeline to privately owned and managed duck ponds in the Suisun Marsh (E-002 and E-003). The Solano Irrigation District and the Department of Fish and Game determine the frequency and volume of these discharges (primarily based on seasonal rainfall). These duck ponds are waters of the State and United States. Discharges to the duck ponds from the Plant are regulated by this Order.

After completion of construction and startup of the new Ledgewood Creek Outfall (E-005), the operation of the two outfalls will be as follows: (a) during normal dry weather conditions, the Boynton Slough outfall will be the primary outfall used in conformance with historical practice; (b) during wet weather conditions, flows exceeding the capacity of the Boynton Slough Outfall (approximately 35 mgd) will be discharged through the Ledgewood Creek Outfall; and (c) during maintenance or other periods of shutdown of the Boynton Slough Outfall, flows will be discharged through the Ledgewood Creek outfall.

Approximately 10% of the treated effluent is recycled for agricultural irrigation, landscape irrigation, and industrial cooling through the Recycling Outfall (E-004), which discharges into irrigation water conveyance and distribution facilities owned and operated by the Solano Irrigation District and the Fairfield-Suisun Sewer District. The discharges of reclaimed water to land are regulated by a separate Order, Water Reclamation Requirements Order No. 91-147, adopted by the Board on October 16, 1991.

3. Revise Finding 7 to read as follows:

7. The names and locations of the Plant’s discharge points are as follows:

Discharge Point Name	Code	Latitude	Longitude
Boynton Slough outfall	E-001	38° 12' 33"	122° 03' 24"
Duck Club Turnout No. 1	E-002	38° 12' 52"	122° 03' 56"
Duck Club Turnout No. 2	E-003	38° 12' 35"	122° 03' 29"
Irrigation Reuse outfall*	E-004	38° 13' 23"	122° 05' 00"
Ledgewood Creek outfall	E-005	38° 14' 06"	122° 03' 31"

*Reclaimed water discharges to land only.

A map illustrating the discharge points is included as Attachment A of this Order.

4. Replace Finding 8 with the following:

8. *Treatment Plant Expansion Plan.* During the ~~past three~~ years (2000-2002), the Plant’s average dry weather flows ranged from 13.2 to 14.8 mgd (determined based on three consecutive dry weather months of each year). The Plant’s actual dry weather flows are up to 85% of the

Plant's design capacity (17.5 mgd). ~~In October, 2001, the District completed a Sewer System and Treatment Plant Master Plan update which concluded that a treatment plant expansion to 21.5 MGD was required to meet the growth in the community in the near future. During this permit term~~ As described in Finding No. 5, the Discharger expects plans to expand the treatment plant capacity to 23.7 mgd (dry weather flow) and to construct a second outfall line. The second outfall line will provide for maintenance of the existing line, seismic redundancy, an alternate discharge point, and will increase wet weather flow discharge capacity. Pursuant to the California Code of Regulations, Title 23. Waters, § 2232 Ensuring Adequate Capacity, there is a provision requiring the Discharger to submit an engineering analysis of the updated dry weather performance and capacity of the Plant as a condition of allowing an ~~This engineering analysis, along with an antidegradation study and a certification of compliance with California Environmental Quality Act are required prior to the Board considering any increase in the maximum allowable discharge of dry weather effluent to 23.7 mgd as described in this Order. The Discharger has prepared this plan and completed and certified an Environmental Impact Report pursuant to the California Environmental Quality Act for the increased treatment and discharge. The Discharger has also prepared an antidegradation analysis to address consistency with federal and state policies for the expanded discharge and the new discharge location in Ledge wood Creek.~~

5. Replace Finding 9 with the following:

9. *Collection System and Pump Stations.* The Discharger's wastewater collection system includes ~~57~~ 70 miles of trunk sewer (lines 12 inches in diameter and larger) and eleven pump stations. Eight of the eleven pump stations have on-site emergency power systems. Of the remaining three, one has an auxiliary gravity flow line, and the other two have sufficient sewer line surcharge capacity to allow for mobilization of portable electrical generation equipment. The Discharger has ongoing preventive maintenance and capital improvement programs for the sewer lines, both gravity and force mains, and for the pump stations to ensure adequate collection system reliability and capacity. Sewers less than 12 inches in diameter are owned and maintained by separate jurisdictions from the Discharger, namely the City of Fairfield, the City of Suisun City, and Travis Air Force Base. Each of these "satellite" collection system agencies is independently responsible for an ongoing program of maintenance and capital improvements for sewer lines and pump stations within their respective jurisdiction in order to ensure adequate capacity and reliability of the collection system. The Discharger has completed a master plan for its collection system and has an ongoing preventive maintenance and capital improvement program for the collection system components to ensure adequate reliability and capacity. The Discharger's facilities and programs effectively address new sewer construction requirements to minimize infiltration and inflow, and to avoid bottlenecks through capacity analysis and planning to implement capital improvements in advance of demand. Therefore, sewer system overflows are not anticipated to increase due to the increased discharge to be allowed by this Order.

6. Replace Finding 10 with the following:

10. *Treatment Process.* The 17.5 mgd average dry weather flow treatment process consists of ~~communit~~ mechanical bar screens (3 units), grit removal (2 aerated chambers), primary sedimentation (4 rectangular basins), biological roughing filters (3 bio-oxidation towers), intermediate clarification (2 square clarifiers), biological treatment by a nitrifying activated sludge process (4 aeration basins), secondary clarification (4 square clarifiers), flow balancing by temporary storage in reservoirs (2 reservoirs, 12.7 million gallons (MG) total volume), tertiary treatment by filtration (8 dual-media filters with anthracite and sand) with chemical

coagulation, disinfection by chlorination (2 contact tanks), and dechlorination using sulfur dioxide. Plant treated effluent flow is measured through a venturi style flow meter. The Plant is designed to provide a 90% removal rate for ammonia nitrogen, and to meet all statewide requirements for ~~reclaimed~~ recycled water of unrestricted reuse quality. A treatment process schematic diagram is included as **Attachment B** of this Order.

The expansion to 23.7 mgd will include the addition of the following treatment units:

- One grit removal basin,
- One round or two rectangular primary clarifiers (final selection dependent upon engineering analysis),
- Post-roughing filter flow split structure,
- One intermediate clarifier,
- Two nitrifying activated sludge aeration basins,
- Two circular secondary clarifiers, and
- Outfall line to Ledgewood Creek with associated modifications to in-plant pumping systems.

7. Replace Finding 12 with the following:

12. *Effluent Flow Measurement.* Plant effluent flow is diverted either directly to the irrigation distribution system, to the final treated effluent holding reservoirs (3 reservoirs, 20.4 MG total volume), or to the Boynton Slough outfall pipeline. Total effluent flow (E-001-A) and reclamation flow (E-004) are measured separately. A lesser amount of treated effluent, unmetered, can be diverted directly to irrigation from the outfall pipeline prior to the Boynton Slough discharge point. Discharges to the duck ponds (E-002 and E-003) are metered by the Solano Irrigation District. With the construction of the Ledgewood Creek outfall, a magnetic style flow meter with associated SCADA interface will be used to monitor and document Ledgewood Creek flows.

8. Replace Finding 13 with the following:

13. *Effluent Monitoring.* Currently, the effluent compliance monitoring point is at the chlorine contact chamber effluent (E-001-A). E-001-S is the compliance point for chlorine residual, pH, and chronic and acute toxicity. ~~Chlorinated final~~ Final effluent (E-001-A) flows through dechlorination before discharge to either the Boynton Slough outfall, or it flows to a the effluent distribution box structure, where, depending on recycled water ~~irrigation~~ demand, it flows to the irrigation distribution system or to the final effluent holding reservoirs. While stored in the reservoirs, the effluent may be subject to potential changes due to natural causes. The 20.4 MG earthen reservoirs are relatively shallow (8-10 feet) and retention times can range from a few hours to several weeks. The Ledgewood Creek Outfall pumping system and pipeline will be located adjacent to and connected to the effluent distribution structure. In addition to flow metering, dechlorination monitoring equipment will be added to the structure and pipeline to ensure that no chlorine residual is discharged to Ledgewood Creek.

9. Replace Finding 15 with the following:

15. *Flow Equalization Facilities.* The Plant has a wet weather treatment capacity of 34.8 mgd with additional wet weather facilities (flow equalization) to contain and treat peak wet weather flows. These facilities include 75 million gallons of equalization storage and an equalization

sedimentation basin with comminution and prechlorination. Flows greater than 34.8 mgd are diverted to flow equalization. Flows diverted to flow equalization are returned to the Plant for treatment after storm flows recede. The Plant and flow equalization facilities provide containment and ~~tertiary~~ treatment of all wastewater flows up to a 20-year recurrence interval storm event. With the addition of new facilities to increase the average dry weather flow capacity of the plant to 23.7 mgd, the wet weather treatment capacity will increase to 52.3 mgd. Flows greater than 52.3 mgd will be diverted to flow equalization and will be returned to the plant for treatment after storm flows recede.

10. Replace Finding 21 with the following:

21. *Boynton Slough and Ledgewood Creek Beneficial Uses.* When considering specific beneficial uses for a water body, the Basin Plan provides the Tributary Rule. The Tributary Rule interprets which beneficial uses are currently or potentially supported where beneficial uses have not been specifically designated. ~~Various sloughs in the watershed, including Boynton Slough, Ledgewood Creek, and Suisun Slough,~~ support the Suisun Marsh. Suisun Marsh is designated in the Basin Plan (page 2-25, Table 2-7) as supporting Estuarine Habitat. By applying the Tributary Rule, Boynton Slough and Ledgewood Creek supports the Estuarine Habitat beneficial use.

In addition, the Discharger performed a receiving water study as required by the previous Order, which in part investigated the appropriate beneficial uses for Boynton Slough. Surveys performed in 2000 and 2001 on the vegetation species along the Boynton Slough indicate that although the plant community can be classified as tidal freshwater marsh, brackish marsh plants are found throughout the study area. Therefore, the study proposes a beneficial use designation of Estuarine Habitat for Boynton Slough (Boynton Slough Beneficial Use Classification, January 24, 2002). The Discharger evaluated the beneficial uses of Ledgewood Creek in the Environmental Impact Report for the plant expansion to 23.7 mgd. That analysis indicated that vegetation typical of both freshwater and brackish marsh conditions were present in Ledgewood Creek. As such, a beneficial use designation of Estuarine Habitat is appropriate for Ledgewood Creek.

11. Replace Finding 31 with the following:

31. *Receiving Water Salinity and Hardness*

- a. Salinity. The Discharger samples its receiving water salinity at eight stations in Boynton and adjacent sloughs in the vicinity of the discharge (see Attachment C for the receiving water sampling stations). ~~The past five~~ Five years (1998-2002) of salinity monitoring data range from 0.0 to 12.2 ppt, with approximately 82% of the data below 5 ppt, 33% of the data below 1 ppt, and less than 1% of the data above 10 ppt. ~~Although the salinity data indicate a freshwater classification based on one of the Basin Plan's salinity criteria, the~~ Waters in which the salinity is equal to or greater than 10 ppt 95% of the time are considered marine. Waters in which the salinity is equal to or less than 1 ppt 95% of the time are considered fresh. The Basin Plan further states, "For discharges to waters with salinities in between these two categories, defined as estuarine, effluent limitations shall be the lower of the marine or freshwater effluent limitation, based on ambient hardness, for each substance." that "for discharges to tidally influenced fresh waters that support estuarine beneficial uses, effluent limitations shall be the lower of the marine, or freshwater effluent limitation based on ambient hardness" (BP, page 4-13). Based on the Tributary Rule, Boynton Slough supports estuarine beneficial use, as it is part of the Suisun Marsh.

Furthermore, Boynton Slough is tidally influenced freshwater, and supports estuarine beneficial uses according to the Boynton Slough Beneficial Use Study dated January 24, 2002. Based on the Basin Plan, CTR, and BPJ, Boynton Slough the receiving water is classified as estuarine. Therefore, the applicable water quality criteria for Boynton Slough are the lower of the marine and freshwater water quality criteria. An analysis of salinities in Ledgewood Creek indicates similar conditions as observed for Boynton Slough. Therefore, the applicable water quality criteria in Ledgewood Creek are also the lower of the marine and freshwater water quality criteria.

- b. Hardness. Ambient hardness value is used to calculate WQOs that are hardness dependent. 268 mg/L as CaCO₃ is the ambient hardness value used to calculate the hardness dependent WQOs. The calculation of the 268 mg/L value was based on an analysis of 145 data points. The hardness data set are censored (from 472 data points to 145 data points) to eliminate hardness values above 400 mg/L and to eliminate hardness values obtained when the receiving water salinity was above 1.0 ppt. From the censored data set, the adjusted geometric mean (AGM, which is the value that 30% of the data points fall below ~~the AGM~~) is calculated to be 268 mg/L (see Fact Sheet for more details). An analysis of available hardness concentration data in Ledgewood Creek indicates similar or higher hardness than used in the derivation the 268 mg/l value for Boynton Slough. Because higher hardness results in less stringent limits for pollutants that are hardness-dependent, applying the Boynton Slough limits to Ledgewood Creek provides a conservative approach.

12. Replace Finding 36 with the following:

36. *Shallow Water Discharge.* The discharges to Boynton Slough and Ledgewood Creek are ~~is~~ into shallow water, with the outfall located at the shoreline of the receiving water Slough. The Boynton Slough outfall is submerged under all conditions except possibly during extreme low tides at which times it is partially submerged. The Ledgewood Creek outfall discharges from the bank into the creek. It is submerged only during wet weather events. The discharge to Boynton Slough or Ledgewood Creek ~~It~~ is currently classified by the Board as a shallow water discharge, and effluent limitations are calculated assuming no dilution (D=0).

The Basin Plan states, “shallow water dischargers may apply to the Regional Board for exceptions to the assigned dilution ratio of D=0 based upon demonstration of compliance with water quality objectives in the receiving waters.” Exceptions will only be considered on a pollutant by pollutant basis. “Exceptions will be granted only if needed to meet effluent limits and only after very rigorous scrutiny of source control and receiving water data.”

13. Replace Finding 41 on Antidegradation and Antibacksliding with the following findings:

41. *Antidegradation and Antibacksliding.* The limitations in this Order are in compliance with the Clean Water Act Section 402(o) prohibition against establishment of less stringent WQBELs for the following reasons:

- (1) For impairing pollutants, the revised final limitations will be in accordance with TMDLs and WLAs once they are established;
- (2) For non-impairing pollutants, the final limitations are/will be consistent with current State WQOs/WQC.
- (3) Antibacksliding does not apply to the interim limitations established under previous Orders;
- (4) If antibacksliding policies apply to interim limitations under 402(o)(2)(c), a less stringent limitation is necessary because of events over which the Discharger has no control and for

which there is no reasonable available remedy, and/or new information is available that was not available during previous permit issuance.

The interim limitations in this permit are in compliance with antidegradation requirements and meet the requirements of the SIP because the interim limitations hold the Discharger to performance levels that will not cause or contribute to water quality impairment or further water quality degradation. Pollutant-specific discussions regarding the applicability of the antidegradation and antibacksliding policies are in findings below (e.g. mercury and cyanide).

To support the increase in permitted capacity to 23.7 mgd average dry weather flow, the Discharger prepared an antidegradation analysis in accordance with guidance contained in State Water Resources Control Board Administrative Procedures Update No. 90-04. The analysis indicated that the increase in permitted dry weather discharge to 23.7 mgd is necessary to accommodate planned growth within the Discharger's service area and is otherwise consistent with federal and state antidegradation policies. The increased discharge will have no measurable effect on the water quality of Suisun Slough, Grizzly Bay, Suisun Bay, or other segments of greater San Francisco Bay.

14. Replace Attachments B and C with the revised figures attached to this Order.

15. Replace Footnote 4 of Table 1 with the following:

4. T — site-specific chronic/acute translators apply to cadmium, chromium (VI), copper, lead, nickel, silver, and zinc; to convert chronic/acute dissolved WQOs to total chronic/acute WQOs, respectively. The Basin Plan WQOs expressed in total recoverable metals are first converted to dissolved WQOs using CTR conversion factors, then site-specific translators are used to convert the dissolved WQOs back to total WQOs (see Fact Sheet for details).

16. Replace Discharge Prohibition A.4 with the following:

A.4. The discharge of average dry weather flows greater than 17.5 mgd million gallons per day is prohibited. Upon Executive Officer approval of the following additional submittals by the Discharger, the permitted average dry weather discharge will increase to 23.7 mgd and discharge to LedgeWood Creek shall be allowed: (a) engineering analysis supporting the above capacity determination for treatment and outfall facilities; (b) certification that the treatment facilities and outfall have been constructed as designed and are available for use; and (c) operations and maintenance manual and contingency plan update for the new treatment and outfall facilities.

The average dry weather flow shall be determined over three consecutive dry weather months each year.

17. Replace the first paragraph under “B. Effluent Limitations” with the following:

The term “effluent” in the following limitations means the treated effluent discharged from the Plant to receiving waters. Compliance with the effluent limits specified in Sections B.1(g), B.2, B.5 and B.6 shall be monitored at Station E-001-S for Boynton Slough discharges and Station E-005 for LedgeWood Creek discharges (see Attachment C). Compliance with all other effluent limits specified in Sections 1 through 7 below shall be monitored at Station E-001-D.

18. Add Station E-005-S to Self Monitoring Program Part B.

Add the following to Section I.B. Effluent:

E-005-S Effluent to LedgeWood Creek Outfall
At a point in the treatment facility, at which point all waste tributary to this discharge is present, prior to the point of discharge.

Add the following to Table 1, Schedule of Sampling, Measurement, and Analysis:

Sampling Station --->	<u>E-005-S</u>		
	<u>G</u>	<u>C-24</u>	<u>Cont.</u>
Flow Rate (mgd)			<u>Cont. [1]</u>
Chlorine Residual (mg/l)			<u>Cont./2-hr [4]</u>
pH (Standard Units)			<u>Cont. [14]</u>
Temperature (degrees C)			<u>Cont.</u>
Acute Toxicity (% Survival)		<u>M [11,18]</u>	
Chronic Toxicity		<u>4/Y[12,18]</u>	

Replace Footnote 1 of Table 1, Schedule of Sampling, Measurement, and Analysis, with the following:

1. Flows shall be monitored continuously and the following shall be reported in monthly self-monitoring reports:
 - a. Influent, average daily flow (A-001);
 - b. Influent, maximum and minimum flow rates and times of occurrence (A-001);
 - c. Effluent, daily flow (E-001-A);
 - d. Effluent, daily flow to Boynton Slough outfall (E-001-S);
 - e. Effluent, daily flow to Irrigation (E-004);
 - f. Effluent, flow distributed to duck club ponds (seasonal, E-002 & E-003). May be reported as monthly totals (in MG);
 - g. Effluent, daily flow to LedgeWood Creek outfall (E-005-S).

Add Footnote 18 to Table 1, Schedule of Sampling, Measurement, and Analysis, as follows:

18. Acute and chronic toxicity testing is to be completed for either E-001-S or E-005-S, but not necessarily both, because the discharge is the same.

This Order becomes effective upon Board adoption.

I, Bruce Wolfe, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, San Francisco Bay Region, on XXXX, 2006.

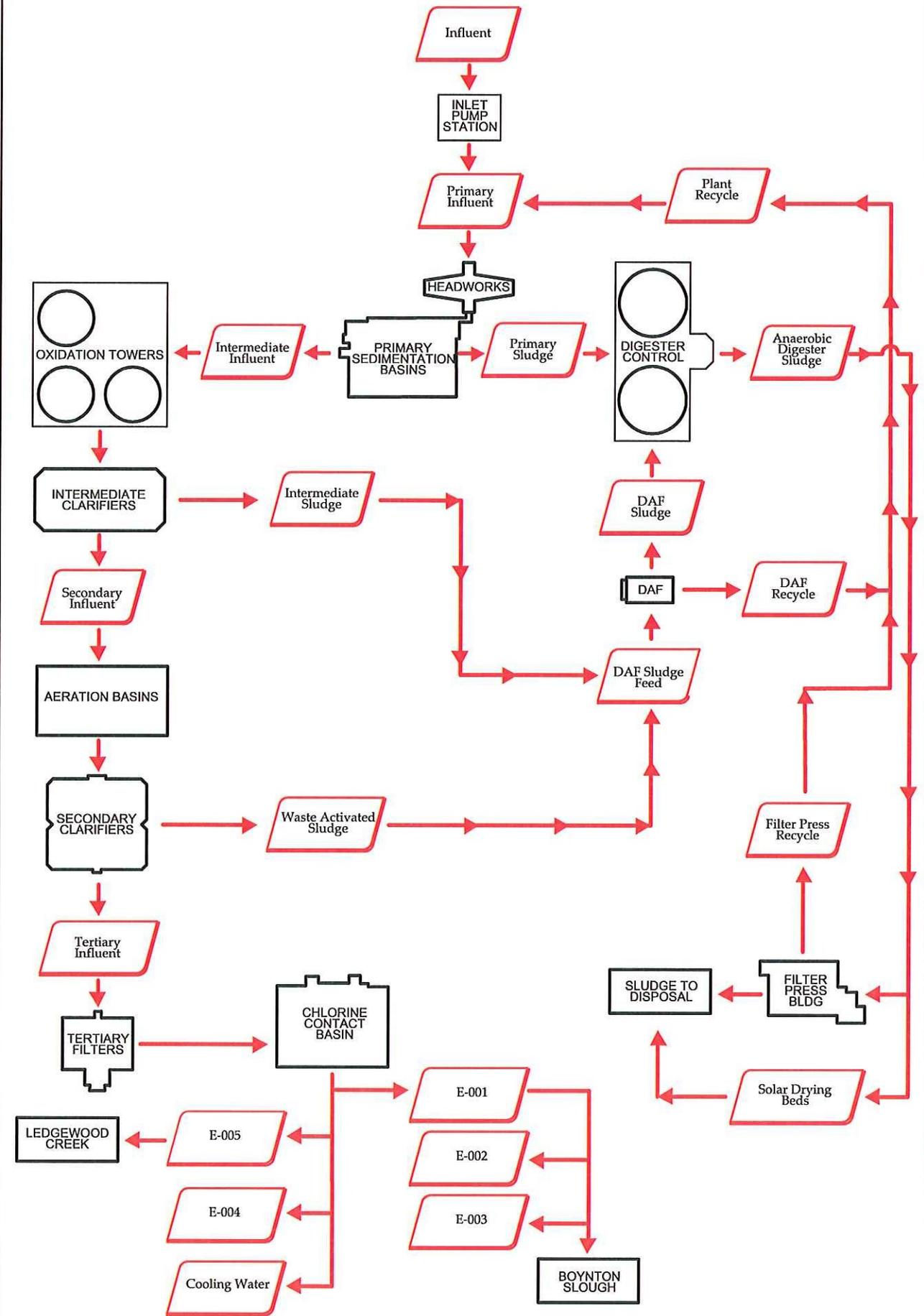
Bruce H. Wolfe
 Executive Officer

ATTACHMENTS (Replacements for Order No. R2-2003-0072)

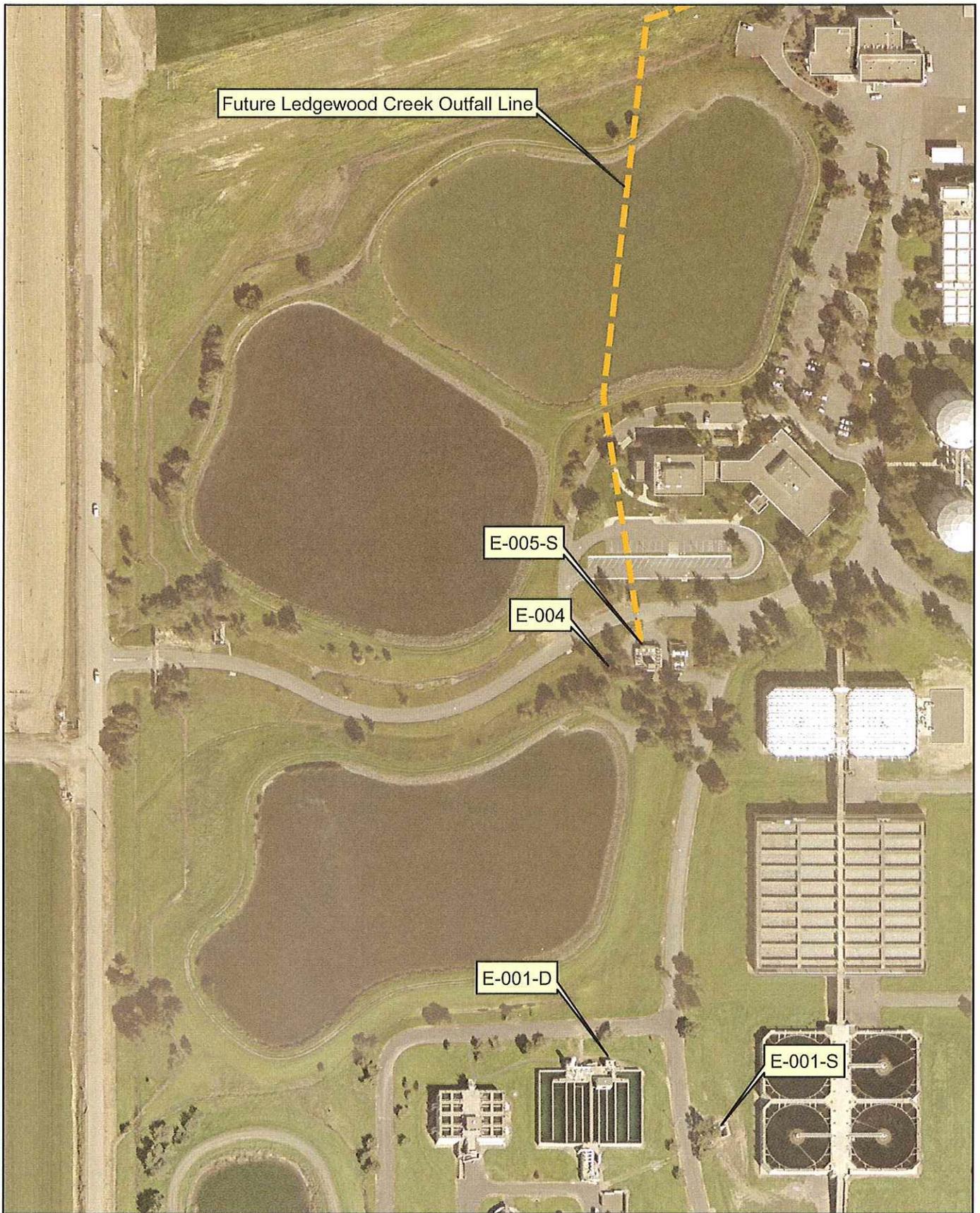
- B. Treatment Process Flow Diagram
- C. Effluent Monitoring Points

ATTACHMENT B Treatment Process Flow Diagram

FAIRFIELD-SUISUN WWTP Plant Schematic



ATTACHMENT C Effluent Monitoring Points



Fairfield-Suisun Sewer District

Plant Site Effluent
Discharge & Monitoring Points

April 25, 2006

APPENDIX B

Fact Sheet

FACT SHEET

ORDER NO. R2-2003-XXXX
NPDES PERMIT NO. CA0038024

AMENDMENT OF WASTE DISCHARGE REQUIREMENTS, ORDER NO. R2-2003-0072, FOR:

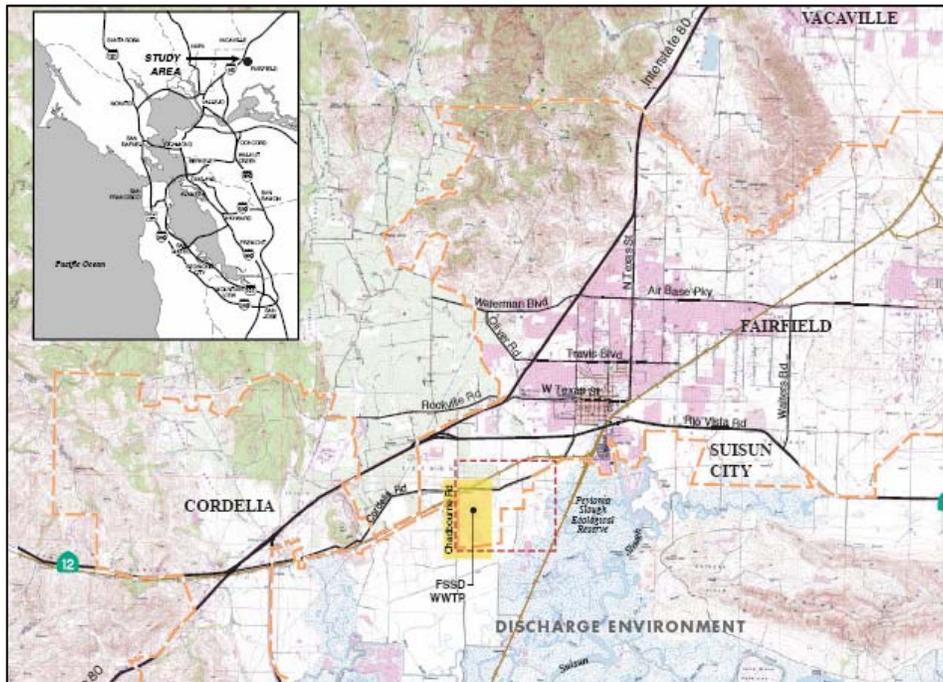
FAIRFIELD-SUISUN SEWER DISTRICT **FAIRFIELD, SOLANO COUNTY**

The Fairfield-Suisun Sewer District (hereinafter the “Discharger”) applied to the Water Board for an amendment of its NPDES permit, Order No. R2-2003-0072, for discharge of pollutants into waters of the State and the United States. The Discharger requested changes in the facility description, permitted capacity, and discharge location. The amended order allows an increase in the discharge of treated wastewater effluent to Boynton Slough, which is part of Suisun Marsh, and also allows the discharge of treated wastewater effluent to LedgeWood Creek, which is a tributary to Suisun Slough, which in turn is a part of Suisun Marsh.

Facility Description

The Discharger owns the Fairfield-Suisun Wastewater Treatment Plant (hereinafter the “Plant”), located at 1010 Chadbourne Road, Fairfield, Solano County, California (see Figure 1). The Plant provides tertiary treatment of wastewater from domestic,

FIGURE 1: Plant Location



Source: ESA/FSSD

commercial, and industrial sources within the City of Fairfield, City of Suisun City, and, by contract, some unincorporated properties in Solano County. The Discharger's service area has a population of approximately 130,000.

The U.S. Environmental Protection Agency and the Water Board have classified this discharge as a major discharge. During the period 2000-2002, the Plant's average dry weather flows (ADWFs) ranged from 13.2 to 14.8 million gallons per day (mgd) (determined based on three consecutive dry weather months of each year). These flows are as high as about 85% of the Plant's design capacity (17.5 mgd).

Approximately 10% of the Plant's treated effluent is recycled for agricultural irrigation, landscape irrigation, and industrial cooling through the recycling outfall (E-004), which discharges into irrigation water conveyance and distribution facilities owned and operated by the Solano Irrigation District and the Discharger. The discharges of reclaimed water to land are regulated by a separate Order, Water Reclamation Requirements Order No. 91-147, adopted by the Water Board on October 16, 1991. Treated effluent is also discharged intermittently from turnouts located on the Boynton Slough outfall pipeline to privately owned and managed duck ponds in Suisun Marsh. The Solano Irrigation District and the Department of Fish and Game determine the frequency and volume of these discharges (primarily based on seasonal rainfall). Discharges to the duck ponds from the Plant are regulated by the existing permit (Order No. R2-2003-0072).

Future Treatment Plant and New Outfall Description

In 2001, the Discharger completed a Sewer System and Treatment Plant Master Plan update. The Master Plan update concluded that a treatment plant expansion is needed to accommodate future growth within the Discharger's service area. The Discharger has completed additional engineering analyses and an Environmental Impact Report for facility construction to increase full treatment capacity to 23.7 mgd ADWF. These studies also address construction of a new outfall to Ledgewood Creek to provide for maintenance of the existing Boynton Slough outfall, seismic redundancy, and increased wet weather capacity to accommodate future flows. The construction of the additional treatment facilities and outfall are to be completed in approximately 2008.

The existing and proposed discharge locations are as follows:

<i>Discharge Point Name</i>	<i>Code</i>	<i>Latitude</i>	<i>Longitude</i>
Boynton Slough Outfall	E-001	38 deg 12 min 33 sec	122 deg 3 min 24 sec
Duck Club Turnout No. 1	E-002	38 deg 12 min 52 sec	122 deg 3 min 56 sec
Duck Club Turnout No. 2	E-003	38 deg 12 min 35 sec	122 deg 3 min 29 sec
Irrigation Reuse Outfall	E-004	38 deg 13 min 23 sec	122 deg 5 min 00 sec
Ledgewood Creek Outfall (<i>proposed</i>)	E-005	38 deg 14 min 6 sec	122 deg 3 min 31 sec

After completion of construction and startup of the new Ledgewood Creek Outfall (E-005), the operation of the two outfalls will be as follows:

- (a) During normal dry weather conditions, the Boynton Slough outfall will be the primary outfall in conformance with past practice;
- (b) During wet weather conditions, flows exceeding the capacity of the Boynton Slough outfall (approximately 35 mgd) will be discharged through the Ledgewood Creek outfall;
- (c) During maintenance or other periods of shutdown of the Boynton Slough outfall, flows will be discharged through the Ledgewood Creek outfall.

Beneficial Uses of Receiving Waters

Beneficial uses have not been specifically designated in the Basin Plan for Boynton Slough and Ledgewood Creek. Various sloughs in the watershed, including Boynton Slough, Ledgewood Creek, and Suisun Slough, support the beneficial uses of Suisun Marsh. Suisun Marsh is designated in the Basin Plan as supporting estuarine habitat. Based on the results of the Boynton Slough Beneficial Use Classification study (2002), brackish marsh plants are found throughout the tributary waters to Suisun Marsh. Based on this, and through consideration of the tributary rule described in the Basin Plan, Boynton Slough has previously been deemed to support the estuarine habitat beneficial use.

As shown in Figure 2, Ledgewood Creek is located in the vicinity of Boynton Slough; based on information provided in the Environmental Impact Report, vegetation in Ledgewood Creek is similar to that existing in Boynton Slough and other tributaries to Suisun Marsh. As such, Ledgewood Creek is deemed to support estuarine habitat.

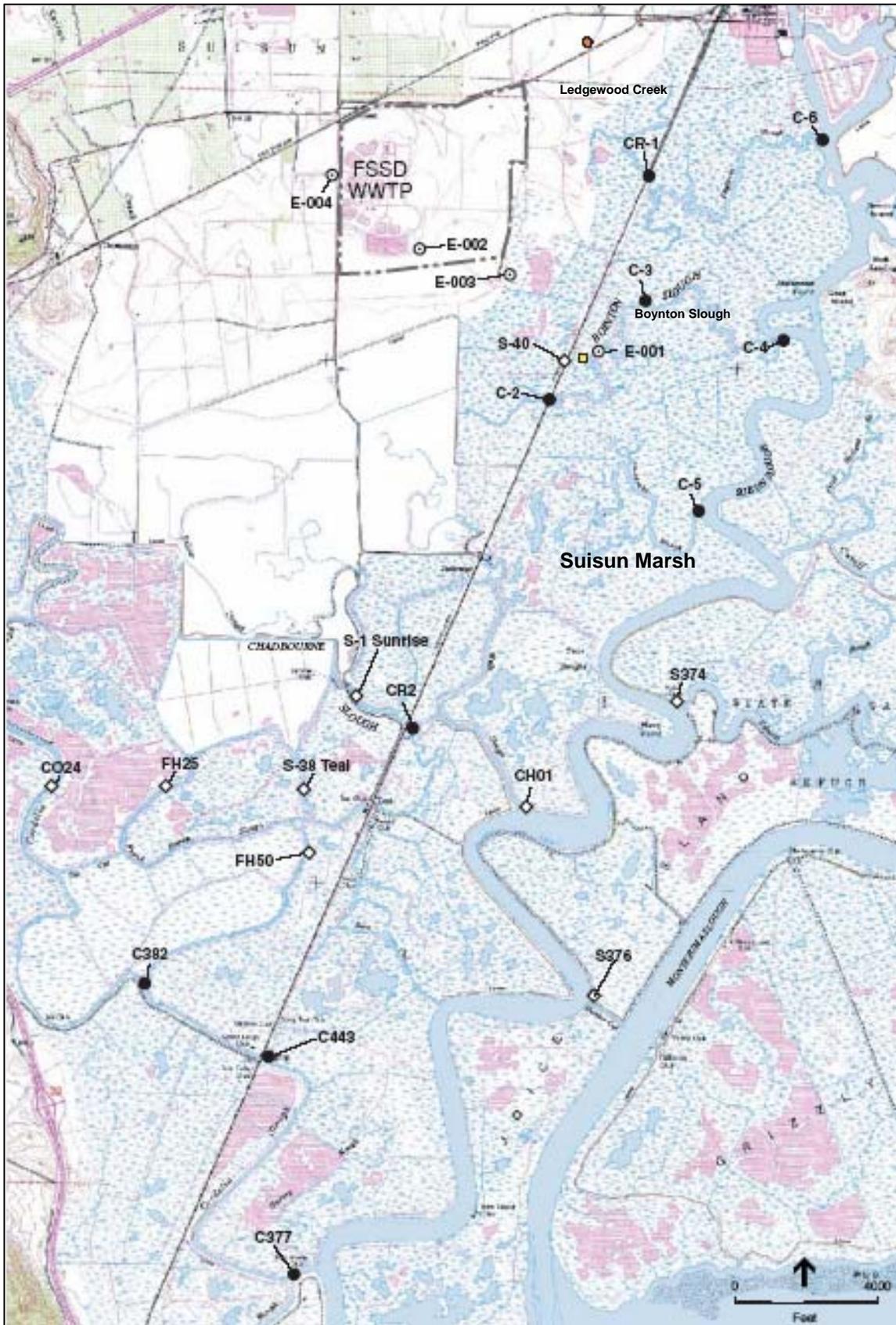
Reasonable Potential Analysis

USEPA regulations (40 CFR 122.44(d)(1)(i)) require that water quality-based effluent limitations be established for constituents that cause or have a reasonable potential to cause or contribute to violations of a water quality objective. The State Implementation Policy (SIP) describes how this determination must be made for priority pollutants for which water quality standards have been adopted in the California Toxics Rule. A reasonable potential analysis is therefore needed for the proposed new discharge to Ledgewood Creek. The analysis of reasonable potential for this discharge described here is patterned after the reasonable potential analysis performed for Order No. R2-2003-0072, the current permit for discharge to Boynton Slough.

Boynton Slough Discharge

The constituents determined to have reasonable potential for the Boynton Slough discharge are shown in Table 1 of Order No. R2-2003-0072 and summarized below:

FIGURE 2: Ledgewood Creek, Boynton Slough, and Suisun Marsh



Source: ESA, FSSD

<i>Constituent with Reasonable Potential</i>	<i>Basis for Reasonable Potential Determination</i>
Cadmium	Maximum Effluent Concentration (MEC) exceeds Basin Plan freshwater objective
Chromium VI	Maximum ambient background concentration exceeds Basin Plan freshwater objective
Copper	MEC and maximum ambient concentration exceeds California Toxics Rule (CTR) saltwater objective
Mercury	Maximum ambient background concentration exceeds Basin Plan freshwater objective
Nickel	Maximum ambient background concentration exceeds Basin Plan saltwater objective
Cyanide	MEC exceeds CTR saltwater objective
TCDD TEQ	Basin Plan narrative and best professional judgment
Dichlorobromomethane	MEC exceeds CTR human health objective
Bis (2-ethylhexyl) phthalate	MEC exceeds CTR human health objective
4,4'-DDE	Maximum ambient background concentration exceeds CTR human health objective
Dieldrin	Maximum ambient background concentration exceeds CTR human health objective

The above reasonable potential determinations were based on several factors: (1) maximum effluent concentrations determined from effluent data collected between January 2000 through December 2002 for trace metals and toxic inorganics and data collected between April 1998 through December 2002 for toxic organics; (2) maximum ambient concentrations detected at the RMP Sacramento River station between 1993 and 2000 and additional data collected under the Section 13267 sampling mandated by the letter dated August 6, 2001; (3) and water quality objectives in the Basin Plan and CTR at the time of adoption of Order No. R2-2003-0072. The applicable water quality objectives were determined based on ambient salinity and hardness concentrations in the vicinity of the Boynton Slough discharge location.

The reasonable potential analysis accounts for the salinity of the receiving waters. The CTR specifies that the lower of freshwater or saltwater water quality objectives (WQOs) apply unless salinity is either less than 1 ppt or greater than 10 ppt more than 95% of the time. Ambient salinity data gathered at eight stations in Boynton Slough and adjacent sloughs in the vicinity of the current discharge for the period 1998 through 2002 were used in the preparation of Order No. R2-2003-0072. Those data indicate a salinity range from 0.0 to 12.2 parts per thousand (ppt), with 33% of the data less than 1 ppt and less than 1% of the data greater than 10 ppt. Therefore, the lower of the saltwater and freshwater objectives were used in the reasonable potential analysis for the Boynton Slough discharge.

The reasonable potential analysis also accounts for the hardness of the receiving waters. Ambient hardness values were used to calculate freshwater WQOs for trace metals that

are hardness dependent. For the Boynton Slough discharge, an adjusted geometric mean hardness value of 268 mg/l as CaCO₃ was used to calculate hardness dependent freshwater WQOs. This value was calculated from a censored data set that included only those hardness values that were (a) less than 400 mg/l as CaCO₃ and (b) associated with salinity values less than 1.0 ppt. The adjusted geometric mean is defined as a value below which lie 30% of the data.

Ledgewood Creek Discharge

The reasonable potential analysis for the proposed Ledgewood Creek discharge is based on the following:

- Effluent quality discharged to Ledgewood Creek will be identical to the effluent quality used as the basis for Order No. R2-2003-0072. Therefore, those elements of the SIP methodology based on effluent quality lead to reasonable potential results for the Ledgewood Creek discharge similar to those determined in Order No. R2-2003-0072 for the Boynton Slough discharge.
- Salinity and hardness conditions in Ledgewood Creek are similar to the conditions that occur in Boynton Slough and adjacent sloughs. The table below shows a summary of salinity and hardness data measured in Ledgewood Creek (Station CR-1) during the period of August 2000 through May 2001.

<i>Sample Date</i>	<i>Salinity (ppt)</i>	<i>Hardness as CaCO₃ (mg/l)</i>
August 9, 2000	2.9	780
October 18, 2000	3.7	700
December 6, 2000	1.7	410
March 7, 2001	0.8	300
May 3, 2001	1.0	380

Based on the above data, and consistent with the determination made for the Boynton Slough discharge, the lower of freshwater or saltwater criteria are applicable to the Ledgewood Creek discharge. Also, based on the above data, the hardness in Ledgewood Creek is equal or greater than the 268 mg/l value used to establish freshwater objectives in the reasonable potential analysis for Boynton Slough. As a conservative assumption, the same freshwater objectives can be used in the Ledgewood Creek reasonable potential analysis and effluent limit derivation.

Since the ambient data for Boynton Slough and Ledgewood Creek are the same, those elements of the SIP methodology based on compliance with receiving water quality objectives lead to the same reasonable potential for the Ledgewood Creek discharge as were determined in Order No. R2-2003-0072 for the Boynton Slough discharge. Therefore the effluent limitations stated in Table 4 of the original permit can apply to the Ledgewood Creek discharge.

Antidegradation Analysis

The Discharger prepared an antidegradation analysis in accordance with State Water Resourced Control Board Administrative Procedures Update 90-04. Based on the study, an increase in the effluent discharge flow rate to 23.7 mgd (ADWF) to accommodate planned growth in the service area and the new discharge to LedgeWood Creek is consistent with federal and state antidegradation policy requirements.

The analysis evaluated the water quality changes associated with the flow increase and new discharge location in LedgeWood Creek. The study considered the increased magnitude of mass loads for specific constituents compared to other San Francisco Bay loads and changes in ambient water quality. The study concluded that the changes will not measurably affect water quality in any portion of Suisun Slough, Grizzly Bay, Suisun Bay, or other San Francisco Bay segments. When compared to other known sources of various pollutants to San Francisco Bay, the incremental increases due to the proposed changes amount to less than 0.5% for all constituents. The results vary by constituent, and in most cases, the incremental increases are less than 0.05%. Mercury is a special concern because, with or without the proposed changes, mercury concentrations sometimes exceed the existing water quality objective (a proposal to change the objective is underway). The incremental mercury load increase would be about 0.003% of the total San Francisco Bay mercury load. Consistent with the proposed San Francisco Bay mercury TMDL, however, the Discharger would not receive an additional wasteload allocation to accommodate this incremental increase and may need to offset it by enhancing mercury control programs (see “Benefits of Source Control Programs,” below). The incremental increase in mercury loads may be offset by a reduction in methylmercury production (see “Benefits Related to Mercury Bioaccumulation,” below).

Net Environmental Benefit

Historic Context

In 1985, as part of NPDES permit reissuance Order No. 85-53, the Water Board granted the Discharger a provisional exception to the Basin Plan prohibition on discharge (1) to waters in which the discharge does not receive an initial dilution of at least 10:1 or (2) to a dead-end slough, similar confined waters, or any immediate tributaries thereof. The exception was based on the provision that the discharge affords a net environmental benefit and the Discharger complies with the requirements of its permit. Order No. 85-53 required maximizing reclaimed water use for irrigation, preparing emergency wastewater storage, completing technical reports on maximizing reclaimed water use and discharge impacts on beneficial uses, and implementing report recommendations.

In 1990, in adopting NPDES permit reissuance Order No. 90-101, the Water Board found that the Discharger complied with the requirements of Order No. 85-53. In addition to taking steps to increase the percentage of effluent discharged for reclamation through the Solano Irrigation District distribution system and construction of flow equalization and storage facilities, the Discharger completed the required technical report about the effects

of the discharge on water quality and beneficial uses (Technical Report on Water Quality, Fairfield-Suisun Sewer District Subregional Wastewater Treatment Plant, September 1987). The report evaluated discharge impacts on Boynton Slough and demonstrated that the discharge affords a net environmental benefit to Boynton Slough and Suisun Marsh.

In 1992, the Discharger completed construction of additional facilities to increase storage capacity for peak wet weather flows and to provide improved flexibility and redundancy for the tertiary treatment plant. The approach to wet weather flow management was in accord with the Basin Plan's wet weather overflow control strategy.

In issuing the existing NPDES permit (Order No. R2-2003-0072) in 2003, the Water Board again found environmental benefit and authorized the discharge of treated effluent to Boynton Slough and the managed duck ponds of Suisun Marsh, provided that the Discharger continues to do the following:

- a. Provide high quality treated effluent;
- b. Operate all treatment facilities to assure high reliability and redundancy;
- c. Implement a source control program for any regulated constituents measured at levels in violation of effluent limitations;
- d. Implement measures to maintain, repair, and upgrade existing wastewater facilities to ensure continued operation and treatment capability in conformance with permit requirements;
- e. Make progress toward construction of expanded or upgraded treatment facilities;
- f. Promote and encourage beneficial reuse of treated wastewater (e.g., discharge of treated effluent to the managed duck ponds of Suisun Marsh); and
- g. Maximize use of reclaimed effluent for irrigation and minimize discharges to Boynton Slough during dry weather.

Benefits of LedgeWood Creek Discharge

The rationale for concluding that Boynton Slough discharges provide environmental benefits also applies to LedgeWood Creek discharges. The Discharger continues to provide high quality treated effluent; operate reliable and redundant treatment facilities; implement source control (see "Benefit of Source Control Programs," below); maintain, repair, and upgrade existing wastewater facilities to ensure permit compliance; make progress toward construction of expanded or upgraded treatment facilities; promote and encourage beneficial reuse of treated wastewater; and maximize use of reclaimed effluent.

Benefits Related to Mercury Bioaccumulation

The Discharger performed a study in 2000 and 2001 to evaluate the impact of its treated effluent discharge on the mercury methylation rate in Suisun Marsh. The Discharger collected receiving water data and effluent data during five sampling events over ten months. The samples were analyzed for total and dissolved mercury and total and dissolved methyl mercury and other water quality constituents. The study showed two significant trends. First, the treated effluent tended to reduce methylation rates in the vicinity of the discharge in Suisun Marsh. Second, the total mercury concentrations in the treated effluent were four-fold lower than concentrations observed in the receiving water. These results demonstrated that, for mercury, the discharge provides a net environmental benefit by reducing bioavailable methyl mercury concentrations and by diluting mercury concentrations in Suisun Marsh.

Benefit of Source Control Programs

The Discharger has developed and implemented source control programs to encourage pollution prevention and waste minimization as one means of addressing constituents of concern within its service area. These programs have been implemented in concert with the direction provided by the Water Board in the Basin Plan.

The Discharger implements mercury source control programs, focusing on dental and household hazardous waste sources. The Discharger has identified local dental facilities and worked with them to gain voluntary reductions in mercury discharges associated with dental amalgam. The Discharger's outreach encourages proper management of dental wastes containing mercury. The discharger also supports and participates in household hazardous waste collection programs implemented by the cities of Fairfield and Suisun City. Key mercury related elements of these programs are the collection of mercury containing electrical switches, fluorescent lights, thermometers, dry cell batteries, and other mercury containing wastes.

The also Discharger implements a copper source reduction program. In addition to supporting the ban on copper containing root control agents, the Discharger has worked closely with local water purveyors to reduce the corrosivity of potable water supplies and has instituted an industrial and commercial inspection program to control the discharge of copper and other pollutants to the sanitary sewer and the storm drain system.

Collection System Capacity

Collection system infrastructure (e.g., sewer mains and pump stations) must be appropriately sized to handle proposed flow increases. Otherwise, increased flows could result in sewer overflows. Sewer system overflows are not anticipated to increase due to the increase in discharge allowed by this permit. The Discharger has developed a master plan for its collection system and has an ongoing preventive maintenance and capital improvement program for the collection system components to ensure adequate reliability and capacity.

The Discharger's wastewater collection system includes 70 miles of trunk sewer lines (lines 12 inches in diameter and larger) and 11 pump stations. Eight of the pump stations have emergency power systems. Of the remaining three pump stations, one has an auxiliary gravity flow line and the others have sufficient sewer line surcharge capacity and remote alarm systems to allow for mobilization of portable electrical generation equipment. The Discharger has ongoing preventive maintenance and capital improvement programs for the sewer lines (both gravity and force mains) and the pump stations to ensure adequate collection system reliability and capacity. Sewers less than 12 inches in diameter are owned and maintained by separate jurisdictions from the Discharger, namely the City of Fairfield, the City of Suisun City, and Travis Air Force Base. Each of these "satellite" collection system agencies is independently responsible for an ongoing program of maintenance and capital improvements for sewer lines and pump stations within their respective jurisdictions to ensure adequate capacity and reliability of the collection system.

The Discharger's Sewer System and Treatment Plant Master Plan update addresses the need for the collection system to accommodate future growth within the Discharger's service area. Existing and planned facilities and programs will effectively minimize infiltration and inflow. The Discharger will use capacity analysis and planning to implement capital improvements in advance of demand.

Rationale for Changes in Provisions and Monitoring Requirements

In addition to amending a number of the findings of Order No. R2-2003-0072, this order amends three specific requirements, listed as items 14, 15, and 16 of the order. The rationales for these changes are described below.

15. Replace Footnote 4 of Table 1

This change adds references to cadmium, lead, and silver to Footnote 4 to correct a clerical error in the existing permit. This change does not directly relate to the increased flow or new discharge location.

16. Replace Discharge Prohibition A.4

This change allows the flow to increase from 17.5 mgd to 23.7 mgd (average dry weather flow) and authorizes the new Ledge Creek outfall. The increase is consistent with state and federal antidegradation policies (see "Antidegradation Analysis," above). The amended text specifies three conditions to be met prior to increasing the flow or using the new outfall. An engineering analysis must be submitted to the Executive Officer that demonstrates that the treatment facilities and outfall are designed to provide sufficient capacity for the increased flows. Certification is required to demonstrate that the treatment facilities and outfall are constructed as designed. The operations and maintenance manual and contingency plan must be updated to address the new facilities.

These requirements will ensure that the plant is designed and constructed in a manner consistent with the permit so as to ensure the protection of water quality.

This change also defines how the average dry weather flow is to be calculated.

17. Replace the first paragraph under “B. Effluent Limitations”

This change adds a new monitoring station for LedgeWood Creek and specifies that the existing effluent limitations that apply to Boynton Slough discharges also apply to LedgeWood Creek discharges. The quality of the LedgeWood Creek discharges is to be the same as the quality of the Boynton Slough discharges. Therefore, compliance with many of the effluent limitations can be monitored at existing station E-001-D. However, a new monitoring station, E-005-S, is to be used to monitor compliance with effluent limitations specified in Sections B.1(g), B.2, B.5, and B.6 of Order No. R2-2003-0072. Such monitoring will reflect conditions specific to the LedgeWood Creek discharge.

18. Add Station E-005-S to Self Monitoring Program Part B

These changes add monitoring station E-005-S to the Self Monitoring Program and specify the schedule of sampling and analysis for station E-005-S. Monitoring at E-005-S is to occur on the same schedule and involve the same analyses as the equivalent monitoring at E-001-S.

Notification of Interested Parties

The Water Board encourages public participation in the amendment process. It notified the Discharger and interested agencies and persons of its intent to amend Order No. R2-2003-0072, and has provided them with an opportunity to submit their written comments and recommendations. Paper and electronic copies of this Order were provided to the Discharger, and the Vallejo Times-Herald published a notice that this item would appear before the Water Board on July 12, 2006.