

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2009-0121

WASTE DISCHARGE REQUIREMENTS

FOR
CITY OF FRESNO
SURFACE WATER TREATMENT PLANT
FRESNO COUNTY

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

1. The City of Fresno (hereafter Discharger) submitted a Report of Waste Discharge (RWD), dated 26 September 2003, to apply for Waste Discharge Requirements (WDRs) for a new Surface Water Treatment Plant (SWTP). Additional information to complete the RWD was received on 12 December 2003, and 20 May 2004.
2. The new SWTP, which is owned by the Discharger, consists of a 38-acre site on the northeast corner of East Behymer and North Chestnut Avenues, Section 13, Township 12 South, Range 20 East, MDB&M as shown in [Attachment A](#), which is attached hereto and made a part of this Order by reference.
3. Construction of the SWTP was completed in 2004. The SWTP is currently designed to treat up to 30 million gallons of water per day (mgd) and operates for approximately 11 months out of the year. For one month out of the year the plant is inactive while the Enterprise Canal is shut down for maintenance and cleaning. In the future, the plant may be expanded to process and treat up to 60 mgd.

Existing Facility and Discharge

4. Intake pumps deliver raw surface water from the Enterprise Canal to the Fresno SWTP for treatment prior to distribution as a public water supply. The Fresno SWTP provides treatment by settling, coagulation, ultraviolet disinfection, and pH control.
5. The raw surface water is screened and passes through the pretreatment Actiflo® clarification process. The Actiflo® clarification process uses microsand and a food grade polymer for ballasted flocculation to improve clarification. This reduces the frequency of filter backwashes. Polyaluminum sulfate (alum) is added to condition the raw water prior to clarification. After clarification, the water enters the ozonation chamber, where ozone is added for disinfection. Once through the clarification and disinfection processes the clarified water is filtered through a series of granulated activated carbon filters to remove further impurities. [Attachment B](#) of this Order, which is attached hereto and made part of this Order by reference, depicts a process flow diagram of the Treatment System.

6. The SWTP treats raw surface water from the Kings and San Joaquin Rivers delivered by the Fresno Irrigation District via the Enterprise Canal. The following table summarizes representative samples of the raw and treated water:

<u>Constituent/Parameter</u>	<u>Units</u>	<u>MCLs</u>	<u>Results</u>	
			<u>Raw Water</u>	<u>Treated Water</u>
pH	pH Units	6.5 to 8.5	7.4	9.0
EC	µmhos/cm	900 ¹	24	100
Total Dissolved Solids	mg/L	500 ¹	17	- - -
Nitrate (as NO ₃)	mg/L	45	< 1	< 2
Chloride	mg/L	250 ¹	1.1	2
Alkalinity (as CaCO ₃)	mg/L	- - -	13	35
Aluminum	mg/L	0.2 ¹	0.064	< 0.05
Arsenic	µg/L	10	< 2	< 2
Copper	µg/L	1000 ¹	< 50	< 50
Iron	mg/L	0.3 ¹	0.083	< 0.1
Lead	µg/L	- - -	< 5	< 5
Magnesium	mg/L	- - -	0.46	1.2
Manganese	mg/L	0.05	< 0.02	< 0.02
Mercury	µg/L	2	< 0.4	< 2
Selenium	µg/L	50	< 2	< 5
Sodium	mg/L	- - -	1.6	14
Zinc	mg/L	5 ¹	0.14	< 0.05
Total Organic Carbon	mg/L	- - -	1.4	1.2
Turbidity	NTU	5 ¹	1.8	< 0.1
Cyanide	µg/L	150	< 100	< 100
Bromate	µg/L	10	< 5	< 5
Total Trihalomethanes	µg/L	80	- - -	0.8 – 6.4

¹. Secondary MCLs set for taste, odor, or appearances.

7. The analytical results indicate that both the raw and treated water are of high quality, and that the treatment process increases the EC of the water by about **75 µmhos/cm**. The increase in the EC is likely attributed to the addition of cationic polymers and alum as flocculents in the treatment process.
8. The SWTP has four unlined settling/evaporation ponds for treating solids discharge from the Actiflo® clarification process and spent water from filter backwashes. The Actiflo® process produces a continuous solids stream flow depending on the plant flow rate. At the SWTP's nominal flow of 20 mgd, the solids flow from the Actiflo® process would be approximately 350 gallons per minute (approximately 0.5 mgd).
9. The filters are backwashed once every 12 to 72 hours depending on the quality of the water entering the filters. The filters are backwashed using treated water from the onsite reservoir. The treated water is pumped up through the bottom of the carbon

filters to dislodge material collected on the granular filter media. An air scouring system is also used during the filter backwash to provide additional agitation. Spent wash water is collected in a concrete lined equalization basin. From there, the wash water is pumped to the active settling/evaporation pond.

10. The treated water contains a small chlorine residual (approximately 1 part per million). However, it is expected that the residual will quickly dissipate once in contact with the activated carbon filters and solids removed from the filter media. In addition, contact with the activated carbon filters will tend to adsorb disinfection byproducts (e.g., trihalomethanes). Thus, the potential threat to groundwater from disinfection byproducts is low.
11. The settling/evaporation ponds are operated one at a time and rotated through operation cycles. Once the capacity of a pond is exhausted, the discharge is stopped and the collected solids are allowed to settle and dry out. Water in the pond is decanted and returned to the headworks of the treatment system.
12. The RWD anticipated that the solids in the ponds would settle out and create an impervious layer to prevent dissolved metals and other waste constituents in the discharge from leaching out into groundwater. The Discharger proposed to leave four to six inches of the settled solids on the bottom of the ponds in order to retain this impervious layer. In addition the Discharger installed lysimeters beneath two of the settling ponds to detect any undesirable leachate, and established a trigger condition to require lining the ponds.
13. The conditions that would require lining the ponds have not occurred, and the lysimeters have remained dry following the first two monitoring events. However, the functionality of the lysimeters is questionable. The Discharger has elected to line the settling/evaporation ponds. The plans call for lining two of the settling/evaporation ponds with a 60 mil HDPE liner covered with a geotextile fabric, and a minimum of two feet of sand to protect the liner when the sludge is being removed. The final plans for the project have been submitted and installation of the liners is expected to occur by December 2010. Thereafter, as resources allow, the remaining two ponds will also be lined to preclude any potential groundwater degradation in whatever capacity the ponds will be utilized (i.e., wastewater storage or supplemental raw water storage during times of emergency plant shutdown).
14. Domestic wastewater is discharged separately to the City of Fresno's Wastewater Treatment Facility.

Site-Specific Conditions

15. The Fresno SWTP is in an arid climate characterized by hot dry summers and mild winters. The rainy season generally extends from November through March. Occasional rains occur during the spring and fall months, but summer months are dry. Average annual precipitation and evaporation in the area are about 10.6 inches and

60 inches, respectively, according to information published by the California Department of Water Resources.

16. According to the USDA Natural Resources Conservation Service *Soil Survey of Eastern Fresno Area, 1971*, soils in the project area consist of Ramona and San Joaquin sandy loam. Permeability of the subsoil is moderately slow, with infiltration rates ranging from about 0.2 to 0.8 inches per hour.
17. Surface water drainage in the area is by sheet flow. Runoff in the region is to the south-southwest. The nearest surface water is the Enterprise Canal, which runs along the eastern boundary of the site. As a mitigation measure the site was graded to divert storm water runoff into an onsite storm water basin and shallow interceptor ditches were constructed around the settling/evaporation ponds to keep storm water runoff out of them. The Discharger is not required to obtain coverage under a National Pollutant Discharge Elimination System general industrial storm water permit since all storm water runoff is retained onsite and does not discharge into a water of the United States.
18. According to Federal Emergency Management Agency (FEMA) maps, the site lies outside of the 100-year flood zone.
19. Land use in the vicinity is primarily urban residential with agricultural farmland in close proximity.

Groundwater Considerations

20. Regional groundwater in the area is encountered at about 130 feet below ground surface (bgs) and flows to the west according to information in *Lines of Equal Elevation of Water in Wells in Unconfined Aquifer*, published by Department of Water Resources in Spring 2006.
21. There are no monitoring wells in place at the site. The RWD provides groundwater quality data for two municipal supply wells within one mile of the site. Both wells are constructed to about 400 feet bgs and screened from 150 to 210 feet, respectively. Background water quality for the two supply wells is fair with an EC of 200 to 360 $\mu\text{mhos/cm}$, TDS from 220 to 300 mg/L, nitrate (as NO_3) from 20 to 50 mg/L, and aluminum and iron below detection limits. Nitrate in groundwater exceeds the Maximum Contaminant Level (MCL) for drinking water of 45 mg/L, likely the result of agricultural activities in and around the area. Since the raw water is low in nitrates (e.g. < 1 mg/L), and nitrogen is not added as part of the treatment process the discharge will not contribute to the presence of nitrates in groundwater.

Basin Plan, Beneficial Uses and Regulatory Considerations

22. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition, revised January 2004* (hereafter Basin Plan) designates beneficial uses, establishes narrative and numerical water quality objectives, contains implementation plans and policies for protecting all waters of the Basin, and incorporates, by reference, plans and policies of

the State Water Resources Control Board (State Water Board). Pursuant to section 13263(a) of the California Water Code (CWC), these requirements implement the Basin Plan.

23. The Fresno SWTP is in Detailed Analysis Unit 233 within the Kings Basin hydrologic unit. The Basin Plan designates the beneficial uses of underlying groundwater as municipal and domestic supply, agricultural supply, industrial service and process supply, and contact and non-contact recreation.
24. Surface waters in proximity to the site include the Enterprise Canal, Dry Creek, and the Teague Ditch, which are considered valley floor waters. The Basin Plan designates the beneficial uses of valley floor waters as: agricultural supply, industrial service and process supply, water contact and non-contact recreation, warm freshwater habitat, wildlife habitat, rare threatened and endangered species, and groundwater recharge.
25. The Basin Plan includes a water quality objective for chemical constituents that, at a minimum, requires waters designated as domestic or municipal supply to meet the MCLs specified in Title 22, California Code of Regulations. The Basin Plan recognizes that the Central Valley Water Board may apply limits more stringent than MCLs to ensure that waters do not contain chemical constituents in concentrations that adversely affect beneficial uses.
26. The Basin Plan establishes narrative water quality objectives for Chemical Constituents, Tastes and Odors, and Toxicity. The Toxicity objective, in summary, requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in human, plant, animal, or aquatic life associated with designated beneficial uses. Quantifying a narrative water quality objective requires a site-specific evaluation of those constituents that have the potential to impact water quality and beneficial uses.
27. The Basin Plan identifies the greatest long-term problem facing the entire Tulare Lake Basin as the increase in salinity in groundwater, which has been accelerated by man's activity. The Basin Plan recognizes that degradation is unavoidable until a valley wide drain is constructed to carry salts out of the basin. Until the drain is available, the Basin Plan establishes several salt management requirements, including:
 - a. The incremental increase in salts from use and treatment must be controlled to the extent possible. The maximum EC shall not exceed the EC of the source water plus 500 $\mu\text{mhos/cm}$. When the source water is from more than one source, the EC shall be a weighted average of all sources.
 - b. Discharges to areas that may recharge good quality groundwater shall not exceed an EC of 1,000 $\mu\text{mhos/cm}$, a chloride content of 175 mg/L, or a boron content of 1.0 mg/L.

Antidegradation Analysis

28. State Water Resources Control Board Resolution No. 68-16 (“Policy with Respect to Maintaining High Quality Waters of the State”) (hereafter Resolution 68-16) prohibits degradation of groundwater unless it has been shown that:
 - a. The degradation is consistent with the maximum benefit to the people of the State;
 - b. The degradation will not unreasonably affect present and anticipated future beneficial uses;
 - c. The degradation does not result in water quality less than that prescribed in state and regional policies, including violation of one or more water quality objectives; and
 - d. The discharger employs BPTC to minimize degradation.
29. Some degradation of groundwater by typical waste constituents released with discharge from a water treatment plant after effective source control and treatment, is consistent with maximum benefit to the people of the State. The SWTP provides a vital resource for the community and reduces its dependence on groundwater. The technology, energy, and waste management advantages of a municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous domestic water wells, and the impact on water resources will be substantially less. Economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, and therefore sufficient reason to accommodate growth and groundwater degradation provided terms of the Basin Plan are met.
30. The Fresno SWTP provides treatment and control of the discharge that incorporates reinforced concrete treatment structures and will include the installation of liners in the settlement/evaporation ponds to prevent percolation of waste constituents to underlying groundwater.
31. Based on the superior chemical character of the raw and treated water, the nature of the treatment process, and the fact that all treatment and waste management units will consist of reinforced concrete or be lined with a low permeability liner to prevent percolation to groundwater, the discharge poses little threat to groundwater quality. At this time, there is no reason to believe that additional BPTC measures are needed to achieve water quality objectives consistent with the maximum benefit to the people of the State.
32. This Order establishes groundwater limits that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan. Although this Order does not require groundwater monitoring, it does include requirements for continued monitoring of the raw water, supernatant return, and liner inspections. If monitoring results reveal a previously undetected threat to water quality, or indicate a change in waste character such that the discharge poses a threat to water quality, the Executive Officer may

require groundwater monitoring and/or the Central Valley Water Board may reopen this Order to reconsider groundwater limitations and other requirements to comply with Resolution No. 68-16.

Designated Waste and Title 27

33. CWC section 13173 defines designated waste as either:
 - a. Hazardous waste that has been granted a variance from hazardous waste management requirements pursuant to section 25143 of the Health and Safety Code.
 - b. Nonhazardous waste that consists of, or contains, pollutants that, under ambient environmental conditions as a waste management unit, could be released in concentrations exceeding applicable water quality objectives or could reasonably be expected to affect beneficial uses of the waters of the state contained in the appropriate state water quality control plan.
34. Release of designated waste is subject to full containment pursuant to the requirements of Title 27, CCR, section 20005 et seq. (hereafter "Title 27"). Title 27, section 20090(b) exempts discharges of designated waste to land from Title 27 containment standards provided the following conditions are met:
 - a. The applicable regional water board has issued waste discharge requirements, or waived such issuance;
 - b. The discharge is in compliance with the applicable basin plan; and
 - c. The waste is not hazardous waste and need not be managed according to Title 22, CCR, Division 4.5, Chapter 11, as a hazardous waste.

As the discharge consists of incidental discharges from treatment and storage facilities associated with a water treatment plant, is regulated by waste discharge requirements consistent with applicable water quality objectives, will not degrade groundwater, and does not need to be managed as a hazardous waste, the SWTP and its discharge is exempt from containment pursuant to Title 27, section 20090(b).

CEQA

35. On 4 October 2001, the City of Fresno adopted a Mitigated Negative Declaration for the construction and operation of a Surface Water Treatment Plant to provide potable drinking water for the City of Fresno.
36. The Central Valley Water Board, as a responsible agency pursuant to CEQA, reviewed and concurs with the general findings in the Mitigated Negative Declaration that the project would have a less than significant impact on water quality. The Mitigated Negative Declaration contains the following mitigation measures to mitigate any adverse impacts to water quality:

- a. Site drainage will be directed away from the Enterprise Canal to keep storm water out of the surface water distribution system [[Prohibition A.1](#), and [Discharge Specifications B.2](#)];
- b. All chemicals utilized in the treatment process will be stored in an H-7 rated containment structure with double walled containment and special spill containment sumps designed to hold and contain liquids. Liquid collected in the sump will be characterized and discharged to the sewer system or disposed of at an appropriate disposal facility [[Prohibition A.2](#)]; and
- c. Construction of a vadose zone monitoring system (lysimeters) beneath two of the settling/evaporation ponds to detect any undesirable leachate from the ponds, with an established trigger condition to require lining the ponds [[Provision E.](#)].

General Findings

37. Pursuant to CCR Title 23, section 2200, this facility is required to pay an annual fee consistent with its threat to water quality and complexity. Based on the criteria in section 2200, the threat to water quality and complexity for this facility is 3C. This determination is consistent with the high quality of the raw and treated water, and discharge into lined settling/evaporation ponds.
38. Pursuant to CWC section 13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.
39. CWC section 13267(b) states that: "In conducting an investigation specified in subdivision (a), the Central Valley Water Board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge, waste outside of its region that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the Central Valley Water Board requires. The burden, including costs, of these reports shall bear a reasonable relationship to the need for the report and the benefits to be obtained from the reports. In requiring those reports, the Central Valley Water Board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports."
40. The technical reports required by this Order and the attached Monitoring and Reporting Program No. [R5-2009-0121](#) are necessary to assure compliance with these waste discharge requirements. The Discharger operates the facility that discharges the waste subject to this Order.
41. The California Department of Water Resources set standards for the construction and destruction of groundwater wells, as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December

1981). These standards, and any more stringent standards adopted by the State or county pursuant to CWC section 13801, apply to all monitoring wells.

42. All the above and the supplemental information and details in the attached Information Sheet, which is incorporated by reference herein, were considered in establishing the following conditions of discharge.

Public Notice

43. The Discharger and interested agencies and persons have been notified of the intent to prescribe waste discharge requirements for this discharge, and they have been provided an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
44. All comments pertaining to the discharge were heard and considered in a public meeting.

IT IS HEREBY ORDERED that, pursuant to sections 13263 and 13267 of the California Water Code, the City of Fresno, and its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the California Water Code and regulations adopted thereunder, shall comply with the following:

A. Prohibitions:

1. Discharge of wastes, including supernatant, treated water, and/or stormwater, to surface waters or surface water drainage courses is prohibited.
2. Discharge of waste classified as 'hazardous', as defined in section 2521(a) of Title 23, California Code of Regulations, section 2510 et seq., is prohibited. Discharge of waste classified as 'designated', as defined in California Water Code section 13173, in a manner that causes violation of groundwater limitations, is prohibited.
3. Discharge of waste to locations other than the settling/evaporation ponds described in [Findings 8 through 14](#) is prohibited.

B. Discharge Specifications:

1. Discharges to the settling ponds shall be limited to the volume of waste that can be completely contained in the ponds in compliance with this Order.
2. All conveyance, treatment, storage, and disposal units shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year return frequency.
3. Objectionable odors originating at this facility shall not be perceivable beyond the limits of the water treatment plant site boundaries.

4. No waste constituent shall be released or discharged, or placed where it will be released or discharged, in a concentration or in a mass that causes violation of groundwater limitations.
5. The Discharger shall operate all systems and equipment to optimize the quality of the waste discharged to the settling ponds. Such optimization does not extend to means and measures that would necessarily cause violation of the facility permit issued by DPH.

C. Solids Specifications:

1. Any handling and storage of solids and/or sludge at the facility shall be temporary, and controlled and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitations of this Order.
2. Collected screenings, sludge, and other solids generated at the facility shall be disposed of in a manner approved by the Executive Officer and consistent with Title 27. Removal for further treatment, disposal, or reuse at sites (i.e., landfill, rendering plants, composting sites, soil amendment sites) operated in accordance with valid waste discharge requirements issued by a regional water quality control board will satisfy this specification.
3. Any proposed change in solids use or disposal practice shall be reported to the Executive Officer at least 90 days in advance of the change.

D. Groundwater Limitations:

1. Release of waste constituents from the facility shall not cause or contribute to groundwater:
 - a. Containing constituent concentrations in excess of the concentrations specified below or natural background quality, whichever is greater:
 - Aluminum of 0.2 mg/L.
 - Electrical Conductivity of 900 μ mhos/cm.
 - Total Trihalomethanes of 80 μ g/L.
 - Total Coliform Organisms of 2.2 MPN/100 mL.
 - For constituents identified in Title 22, the MCLs quantified therein.
 - b. Containing taste or odor-producing constituents, toxic substances, or any other constituents in concentrations that cause nuisance or adversely affect beneficial uses.

E. Provisions:

1. The Discharger shall comply with the *Standard Provisions and Reporting Requirements for Waste Discharge Requirements*, dated 1 March 1991, which are part of this Order. This attachment and its individual paragraphs are referred to as *Standard Provisions*.
2. The Discharger shall comply with Monitoring and Reporting Program (MRP) No. [R5-2009-0121](#), which is part of this Order, and any revisions thereto as adopted by the Central Valley Water Board or approved by the Executive Officer. The submittal date shall be no later than the submittal date specified in the Monitoring and Reporting Program for Discharger self-monitoring reports.
3. The Discharger shall keep a copy of this Order at the facility, including its MRP, Information Sheet, attachments, and Standard Provisions, for reference by operating personnel. Key operating personnel shall be familiar with its contents.
4. The Discharger must at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) that are installed or used by the Discharger to achieve compliance with the conditions of this Order. Proper operation and maintenance also include adequate laboratory controls and appropriate quality assurance procedures. This Provision requires the operation of back-up or auxiliary facilities or similar systems that are installed by the Discharger only when the operation is necessary to achieve compliance with the conditions of the Order.
5. 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 sections 415 and 3065 of Title 16, CCR, 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.
6. The Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. Accordingly, the Discharger shall submit to the Central Valley Water Board on or before each report due date the specified document or, if an action is specified, a written report detailing evidence of compliance with the date and task. If noncompliance is being reported, the reasons for such noncompliance shall be stated, plus an estimate of the date when the Discharger will be in compliance. The Discharger shall notify the Central Valley Water Board by letter when it returns to compliance with the time schedule. Violations may result in enforcement action,

including Central Valley Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

7. In the event of any change in control or ownership of land or waste treatment and storage 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 appropriate Central Valley Water Board office (currently, the Fresno office).
8. 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, the address and telephone number of the persons responsible for contact with the Central Valley Water Board and a statement. The statement shall comply with the signatory paragraph of Standard Provision B.3 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. If approved by the Executive Officer, the transfer request will be submitted to the Central Valley Water Board for its consideration of transferring the ownership of this Order at one of its regularly scheduled meetings.
9. The Discharger shall maintain and operate all ponds sufficient to protect the integrity of containment levees and prevent overtopping or overflows. Unless a California civil engineer certifies (based on design, construction, and conditions of operation and maintenance) that less freeboard is adequate, the operating freeboard in any pond shall never be less than two feet (measured vertically). As a means of management and to discern compliance with this Provision, the Discharger shall install and maintain in each pond permanent markers with calibration that indicates the water level at design capacity and enables determination of available operational freeboard.
10. **By 1 December 2010**, the Discharger shall complete installation of the liners for the two settling/evaporation ponds.
11. **By 1 March 2011**, the Discharger shall submit a Post-construction Report for the pond liners. At a minimum, the Post-Construction Report should include: a) as-built-plans, b) testing results and certifications as part of the quality assurance and control sampling for subsurface, liner material, and seam testing, and c) an Operation and Maintenance Plan for the liner to include procedures and equipment requirements for removing accumulated sludge, liner inspections, and repair procedures. In addition, the Discharger shall submit Certification that the lined ponds shall have sufficient capacity to handle discharges from the SWTP up to the current treatment capacity of 30 mgd.

12. If the Central Valley Water Board determines that waste constituents in the discharge have reasonable potential to cause or contribute to an exceedance of any groundwater quality objective, this Order may be reopened for consideration of addition or revision of appropriate numerical effluent or groundwater limitations for the problem constituents.

I, PAMELA C. CREEDON, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 10 December 2009.

Original signed by:

PAMELA C. CREEDON, Executive Officer

Order Attachments:

Monitoring and Reporting Program No. [R5-2009-0121](#)

Information Sheet

A. Site map

B. Flow diagram

Standard Provisions (1 March 1991) (separate attachment to Discharger only)

KC/DKP 12/10/2009

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2009-0121

FOR
CITY OF FRESNO
SURFACE WATER TREATMENT PLANT
FRESNO COUNTY

This Monitoring and Reporting Program (MRP) is required pursuant to California Water Code (CWC) section 13267.

The Discharger shall not implement any changes to this MRP unless and until the Central Valley Water Board adopts, or the Executive Officer issues, a revised MRP. Changes to sample location shall be established with concurrence of Central Valley Water Board staff, and a description of the revised stations shall be submitted for approval by the Executive Officer.

All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. All analyses shall be performed in accordance with **Standard Provisions and Reporting Requirements for Waste Discharge Requirements**, dated 1 March 1991 (Standard Provisions).

Field test instruments (such as pH) may be used provided that the operator is trained in the proper use of the instrument and each instrument is serviced and/or calibrated at the recommended frequency by the manufacturer or in accordance with manufacturer instructions.

Analytical procedures shall comply with the methods and holding times specified in the following: *Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater* (EPA); *Test Methods for Evaluating Solid Waste* (EPA); *Methods for Chemical Analysis of Water and Wastes* (EPA); *Methods for Determination of Inorganic Substances in Environmental Samples* (EPA); *Standard Methods for the Examination of Water and Wastewater* (APHA/AWWA/WEF); and *Soil, Plant and Water Reference Methods for the Western Region* (WREP 125). Approved editions shall be those that are approved for use by the United States Environmental Protection Agency or the California Department of Public Health's Environmental Laboratory Accreditation Program. The Discharger may propose alternative methods for approval by the Executive Officer.

If monitoring consistently shows no significant variation in magnitude of a constituent concentration or parameter after at least 12 months of monitoring, the Discharger may request this MRP be revised to reduce monitoring frequency. The proposal must include adequate technical justification for reduction in monitoring frequency.

A glossary of terms used within this MRP is included on [page 6](#).

RAW WATER MONITORING

The Discharger shall monitor the quantity and quality of the raw water from the Enterprise Canal. The Discharger shall establish permanent monitoring stations within the SWTP as needed to ensure that all samples are representative of these streams. At a minimum, the Discharger shall monitor the raw water as follows:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Continuous	Flow	mgd	Meter
Weekly	pH	pH Units	Grab
Weekly	EC	µmhos/cm	Grab

SUPERNATANT WASTEWATER MONITORING

Samples of the supernatant return water shall be collected just prior to the return flow entering the treatment train. Wastewater monitoring shall include at least the following:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Continuous	Flow	mgd	Meter
Weekly	pH	pH Units	Grab
Weekly	EC	µmhos/cm	Grab
Quarterly	Dissolved metals ^{1,2}	µg/L	Grab
Quarterly	General minerals	mg/L	Grab
Quarterly	Bromoform	µg/L	Grab
Quarterly	Bromodichloromethane	µg/L	Grab
Quarterly	Chloroform	µg/L	Grab
Quarterly	Dibromochloromethane	µg/L	Grab
Quarterly	Total Trihalomethanes	µg/L	Grab

1. Samples shall be filtered through a 0.45-micron filter prior to preservation

2. At a minimum, the following metals shall be included: aluminum, arsenic, cadmium, chromium, copper, iron, lead, magnesium, manganese, mercury, molybdenum, nickel, silver, thallium, vanadium, and zinc.

POND MONITORING

Permanent markers (e.g., staff gages) shall be placed in all ponds. The markers shall have calibrations indicating the water level at design capacity and available operational freeboard. Pond monitoring shall include at least the following:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Weekly	Freeboard	Feet ¹	Grab

¹. To nearest tenth of a foot

POND LINER INSPECTION

The condition of the liner in each settling/evaporation pond shall be inspected following the excavation and removal of the settled sludge. The location of any punctures, tears, or other damage shall be recorded along with specific recommendations for repairs as needed to prevent pond leakage.

SLUDGE DISPOSAL MONITORING

The Discharger shall maintain a written log of all sludge disposal activities. For each discrete quantity of sludge removed from the facility, the log shall contain the following information:

Date.

Name and signature of the recorder of entry.

Volume or weight of sludge removed.

Name and address of permitted disposal facility.

Analytical results for any sludge monitoring conducted at the request of the disposal facility.

Transport method and name of transporter.

REPORTING

All monitoring results shall be reported in an **Annual Monitoring Report**, due by the **first day of the second month following the calendar year (i.e., 1 February)**.

A transmittal letter shall accompany each monitoring report. The transmittal letter shall discuss any violations that occurred during the reporting period and all actions taken or planned for correcting violations, such as operation or facility modifications. If the Discharger has previously submitted a report describing corrective actions or a time schedule for implementing the corrective actions, reference to the previous correspondence is satisfactory.

The following information is to be included on all monitoring and annual reports, as well as any report transmittal letters, submitted to the Central Valley Water Board:

Discharger name
Facility Name
MRP Number
Contact Information (telephone number and email)

In reporting 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 that illustrates clearly whether the Discharger complies with waste discharge requirements.

In addition to the details specified in Standard Provision C.3, monitoring information shall include the method detection limit (MDL) and the Reporting limit (RL) or practical quantitation limit (PQL). If the regulatory limit for a given constituent is less than the RL (or PQL), then any analytical results for that constituent that are below the RL (or PQL) but above the MDL shall be reported and flagged as estimated.

Laboratory analysis reports do not need to be included in the monitoring reports; however, the laboratory reports must be retained for a minimum of three years in accordance with Standard Provision C.3.

All monitoring reports shall comply with the signatory requirements in Standard Provision B.3. Monitoring data or discussions submitted concerning WWTP performance must also be signed and certified by the chief plant operator. If the chief plant operator is not in direct line of supervision of the laboratory function for a Discharger conducting any of its own analyses, reports must also be signed and certified by the chief of the laboratory.

All monitoring reports 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.

A. All Annual Monitoring Reports, shall include the following:

1. The results of all water, wastewater, pond, and sludge disposal monitoring performed during the year, including all daily, monthly, and quarterly sampling data. The data should be presented in tabular and/or graphical form with data arranged to confirm compliance with the WDRs.
2. A detailed listing of any violations that occurred within the quarter and measures to correct or prevent further occurrences.
3. If requested by staff, copies of laboratory analytical report(s); and a calibration log verifying calibration of all hand-held monitoring instruments and devices used to comply with the prescribed monitoring program.

4. The names, certificate grades, and general responsibilities of all persons in charge of the treatment plant.
5. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibrations (Standard Provision C.4).
6. Volume of raw water treated during the previous year.
7. A detailed description of any operational changes, new, or proposed systems for sludge handling or dewatering.
8. A summary of pond liner inspection reports and documentation of all liner repairs recommended and completed.
9. A summary of sludge disposal practices for the year, including volume (in cubic yards or tons) removed for the year, and tabulation of all sludge disposal monitoring data.
10. A discussion of any data gaps and potential deficiencies/redundancies in the monitoring system or reporting program.
11. A forecast of influent flows for the coming year, as described in Standard Provision E.4.

Ordered by:

Original signed by:

PAMELA C. CREEDON, Executive Officer

10 December 2009

(Date)

KC/DKP: 12/10/2009

GLOSSARY

BOD ₅	Five-day biochemical oxygen demand		
CBOD	Carbonaceous BOD		
DO	Dissolved oxygen		
EC	Electrical conductivity at 25° C		
FDS	Fixed dissolved solids		
NTU	Nephelometric turbidity unit		
TKN	Total Kjeldahl nitrogen		
TDS	Total dissolved solids		
TSS	Total suspended solids		
Continuous	The specified parameter shall be measured by a meter continuously.		
24-Hour Composite	Samples shall be a flow-proportioned composite consisting of at least eight aliquots.		
Daily	Samples shall be collected every day.		
Twice Weekly	Samples shall be collected at least twice per week on non-consecutive days.		
Weekly	Samples shall be collected at least once per week.		
Twice Monthly	Samples shall be collected at least twice per month during non-consecutive weeks.		
Monthly	Samples shall be collected at least once per month.		
Bimonthly	Samples shall be collected at least once every two months (i.e., six times per year) during non-consecutive months.		
Quarterly	Samples shall be collected at least once per calendar quarter. Unless otherwise specified or approved, samples shall be collected in January, April, July, and October.		
Semiannually	Samples shall be collected at least once every six months (i.e., two times per year). Unless otherwise specified or approved, samples shall be collected in April and October.		
Annually	Samples shall be collected at least once per year. Unless otherwise specified or approved, samples shall be collected in October.		
mg/L	Milligrams per liter		
mL/L	Milliliters [of solids] per liter		
µg/L	Micrograms per liter		
µmhos/cm	Micromhos per centimeter		
mgd	Million gallons per day		
MPN/100 mL	Most probable number [of organisms] per 100 milliliters		
General Minerals	Analysis for General Minerals shall include at least the following:		
	Alkalinity	Chloride	Phosphorous
	Bicarbonate	Hardness	Sodium
	Calcium	Magnesium	Sulfate
	Carbonate	Potassium	TDS
	General Minerals analyses shall be accompanied by documentation of cation/anion balance.		

INFORMATION SHEET

R5-2009-0121
CITY OF FRESNO
SURFACE WATER TREATMENT PLANT
FRESNO COUNTY

Background

The City of Fresno (hereafter Discharger) submitted a Report of Waste Discharge (RWD), dated 26 September 2003, for a new Surface Water Treatment Plant (SWTP). Additional information to complete the RWD was received on 12 December 2003, and 20 May 2004.

The SWTP is owned and operated by the City of Fresno to provide potable water for domestic use. Construction of the SWTP was completed in 2004. The SWTP is currently designed to treat up to 30 million gallons of water per day (mgd). In the future the plant may be expanded to process and treat up to 60 mgd. The SWTP operates for approximately 11 months out of the year. For one month out of the year the plant is inactive while the Enterprise Canal is shut down for maintenance and cleaning.

Treatment Process

Intake pumps deliver raw surface water from the Enterprise Canal to the pretreatment Actiflo® clarification process. The Actiflo® clarification process uses microsand and a food grade polymer for ballasted flocculation to improve clarification and reduces the frequency of filter backwashes. Polyaluminum sulfate (alum) is added to condition the raw water prior to clarification. After clarification the water enters the ozonation chamber, where ozone is added for disinfection. Once through the clarification and disinfection processes, the clarified water is filtered through a series of granulated activated carbon filters to remove further impurities. Following treatment and disinfection the treated water is stored in an underground reservoir tank prior to distribution. Sodium hypochlorate is added to the treated water to provide sufficient chlorine residual for the distribution system, and carbon dioxide is added as needed for pH adjustment.

Solids from the clarifier and filter backwash water are discharged into four onsite settling/evaporation ponds. The settling/evaporation ponds are operated one at a time and rotated through operation cycles. Once the capacity of a pond is exhausted the discharge is stopped and the collected solids are allowed to dry. During the drying mode the solids remain in the offline pond and allowed to settle out. Water in the pond is decanted and returned to the headworks of the treatment system.

Solids in the ponds were expected to settle out and create an impervious layer to prevent dissolved metals and other waste constituents in the discharge from leaching out into groundwater. The Discharger proposed to leave four to six inches of the settled solids on the bottom of the ponds in order to retain this impervious layer. In addition the Discharger installed lysimeters beneath two of the settling ponds to detect any undesirable leachate, and established a trigger condition to require lining the ponds.

The conditions that would require lining the ponds have not occurred, and the lysimeters have remained dry following the first two monitoring events. However, the functionality of the lysimeters is questionable.

Monitoring of the raw water, treated water, and sludge does not indicate that the discharge is a designated waste as defined by CCR, Title 27, section 20005. However because of concerns with the lysimeters, the Discharger has elected to line two of the settling/evaporation ponds to address possible issues of migration and potential impacts to groundwater. The plans call for lining the ponds with a 60 mil HDPE liner covered with a geotextile fabric and a minimum of two feet of sand, to protect the liner when the sludge is being removed. Thereafter, as resources allow, the remaining two ponds will also be lined to preclude any potential groundwater degradation in whatever capacity the ponds will be utilized (i.e., wastewater storage or supplemental raw water storage during times of emergency plant shutdown).

Groundwater Conditions

Regional groundwater in the area is encountered at about 130 feet below ground surface (bgs) and flows to the west according to information in Lines of Equal Elevation of Water in Wells in Unconfined Aquifer, published by Department of Water Resources in Spring 2006.

There are no monitoring wells onsite. The RWD provides groundwater quality data for two municipal supply wells (Wells 185 and 186) within one mile of the site. Both wells are constructed to about 400 feet below grade and screened from 150 and 210 feet, respectively. Background water quality from the two supply wells is fair with an EC of 200 to 360 $\mu\text{mhos/cm}$, TDS from 220 to 300 mg/L, nitrate (as NO_3) from 20 to 50 mg/L, and aluminum and iron below detection limits. Nitrate in groundwater exceeds the Maximum Contaminant Level (MCL) for nitrates of 45 mg/L, likely the result of agricultural activities in and around the area. Since the raw water is low in nitrates (e.g. < 1 mg/L), and nitrogen is not added as part of the treatment process the discharge will not contribute to the presence of nitrates in groundwater.

Basin Plan, Beneficial Uses, and Regulatory Considerations

The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition, revised January 2004* (hereafter Basin Plan) designates beneficial uses, establishes narrative and numerical water quality objectives, contains implementation plans and policies for protecting all waters of the Basin, and incorporates, by reference, plans and policies of the State Water Resources Control Board (State Water Board). Pursuant to section 13263(a) of the California Water Code (CWC), these requirements implement the Basin Plan.

The Basin Plan indicates the greatest long-term problem facing the entire Tulare Lake Basin is increasing salinity in groundwater, a process accelerated by man's activities and particularly affected by intensive irrigated agriculture. The Basin Plan recognizes that degradation is unavoidable until there is a long-term solution to the salt imbalance. The Regional Water Board encourages proactive management of waste streams by dischargers to control addition of salt through use, and has established an incremental EC limitation of 500 $\mu\text{mhos/cm}$ over source water or a maximum of 1,000 $\mu\text{mhos/cm}$, as the measure of the permissible addition of

salt constituents through use. Discharges to areas that may recharge good quality groundwater shall not exceed an EC of 1,000 $\mu\text{mhos/cm}$, a chloride content of 175 mg/L, or a boron content of 1.0 mg/L.

Antidegradation

The antidegradation directives of State Water Board Resolution No. 68-16, "Statement of Policy With Respect to Maintaining High Quality Waters in California," or "Antidegradation Policy" require that waters of the State that are better in quality than established water quality objectives be maintained "consistent with the maximum benefit to the people of the State." Policy and procedures for complying with this directive are set forth in the Basin Plan.

Some degradation of groundwater by typical waste constituents released with discharge from a water treatment plant after effective source control, and treatment is consistent with maximum benefit to the people of the State. The SWTP provides a vital resource for the community and reduces its dependence on groundwater. The technology, energy, and waste management advantages of a municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous domestic water wells, and the impact on water resources will be substantially less. Economic prosperity of valley communities and associated industry is of maximum benefit to the people of the State, and therefore sufficient reason to accommodate growth and groundwater degradation provided terms of the Basin Plan are met.

The Fresno SWTP provides treatment and control of the discharge that incorporates reinforced concrete treatment structures and will include the installation of liners in the settlement/evaporation ponds to prevent percolation of waste constituents to underlying groundwater. Based on the superior chemical character of the raw and treated water, the nature of the treatment process, and the fact that all treatment and waste management units will consist of reinforced concrete or be lined with a low permeability liner to prevent percolation to groundwater, the discharge poses little threat to groundwater quality. At this time, there is no reason to believe that additional BPTC measures are needed to achieve water quality objectives consistent with the maximum benefit to the people of the State.

The proposed Order establishes groundwater limits that will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan. Although this Order does not require groundwater monitoring, it does include requirements for continued monitoring of the raw water, supernatant return, and liner inspections. If monitoring results reveal a previously undetected threat to water quality, or indicate a change in waste character such that the discharge poses a threat to water quality, the Executive Officer may require groundwater monitoring and/or the Central Valley Water Board may reopen this Order to reconsider groundwater limitations and other requirements to comply with Resolution No. 68-16.

Title 27

Title 27, CCR, section 20005 et seq. (Title 27) contains regulations to address certain discharges to land. Title 27 establishes a waste classification system, specifies siting and construction standards for full containment of classified waste, requires extensive monitoring of groundwater and the unsaturated zone for any indication of failure of containment, and specifies closure and post-closure maintenance requirements. Generally, no degradation of groundwater quality by any waste constituent in a classified waste is acceptable under Title 27 regulations.

Title 27 section 20090(b) exempts discharges of designated waste to land from Title 27 containment standards provided the Central Valley Water Board has issued waste discharge requirements or waived such issuance; the discharge is in compliance with the Basin Plan; and the waste need not be managed according to Title 22, CCR, Division 4.5, Chapter 11, as a hazardous waste.

The discharge consists of incidental discharges from treatment and storage facilities associated with a water treatment plant, is regulated by waste discharge requirements consistent with applicable water quality objectives, and does not need to be managed as a designated or hazardous waste.

CEQA

On 4 October 2001, the City of Fresno adopted a Mitigated Negative Declaration for the construction and operation of a Surface Water Treatment Plant to provide potable drinking water for the City of Fresno. A Notice of Determination was filed on 15 January 2002.

The Mitigated Negative Declaration determined that the project would have a less than significant impact on water quality. The Central Valley Water Board reviewed and concurred with the conclusions in the Mitigated Negative Declaration that the project would have a less than significant impact on water quality. The Mitigated Negative Declaration contains the following mitigation measures to mitigate any adverse impacts to water quality:

- a. Site drainage will be directed away from the Enterprise Canal to keep storm water out of the surface water distribution system;
- b. All chemicals utilized in the treatment process will be stored in an H-7 rated containment structure with double walled containment and special spill containment sumps designed to hold and contain liquids. Liquid collected in the sump will be characterized and discharged to the sewer system or disposed of at an appropriate disposal facility; and
- c. Construction of a vadose zone monitoring system (lysimeters) beneath two of the settling/evaporation ponds to detect any undesirable leachate from the ponds, with an established trigger condition to require lining the ponds.

Proposed Order Terms and Conditions

Discharge Prohibitions, Effluent Limitations, Discharge Specifications, and Provisions

The proposed Order prohibits discharge to surface waters and water drainage courses.

Because the waste contains little organic matter, the standard specification requiring that dissolved oxygen concentration in the ponds be maintained above 1.0 mg/L oxygen is not necessary to prevent nuisance conditions.

The proposed Order would prescribe groundwater limitations that implement water quality objectives for groundwater from the Basin Plan. The limitations require that the discharge not cause or contribute to exceedances of these objectives or natural background water quality, whichever is greater.

To address possible issues of migration of waste constituents to groundwater the Discharger has elected to install 60-mil HDPE liners in two of the settling/evaporation ponds. This Order includes provisions requiring the Discharger to complete installation of the proposed liners and submit a Post-Construction Report and Operations and Maintenance Plan. In addition, the Discharger is required to submit certification that the lined ponds shall have sufficient capacity to handle discharges from the SWTP up to the current treatment capacity of 30 mgd.

Monitoring Requirements

Section 13267 of the CWC authorizes the Central Valley Water Board to require monitoring and technical reports as necessary to investigate the impact of a waste discharge on waters of the state. In recent years there has been increased emphasis on obtaining all necessary information, assuring the information is timely as well as representative and accurate, and thereby improving accountability of any discharger for meeting the conditions of discharge. Section 13268 of the CWC authorizes assessment of civil administrative liability where appropriate.

The proposed Order includes requirements for monitoring for flow and field parameters of raw water and supernatant return water, as well as for constituents of concern including dissolved metals and trihalomethanes in the supernatant return water. In addition, the proposed Order requires the Discharger to keep accurate records of sludge disposal activities and liner inspections.

Reopener

The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them. It may be appropriate to reopen the Order if applicable laws and regulations change.



International Avenue

ENTERPRISE CANAL

FRESNO SURFACE WATER
TREATMENT PLANT

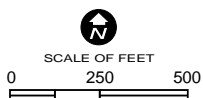
SETTLING PONDS

Behymer Avenue

Chestnut Avenue

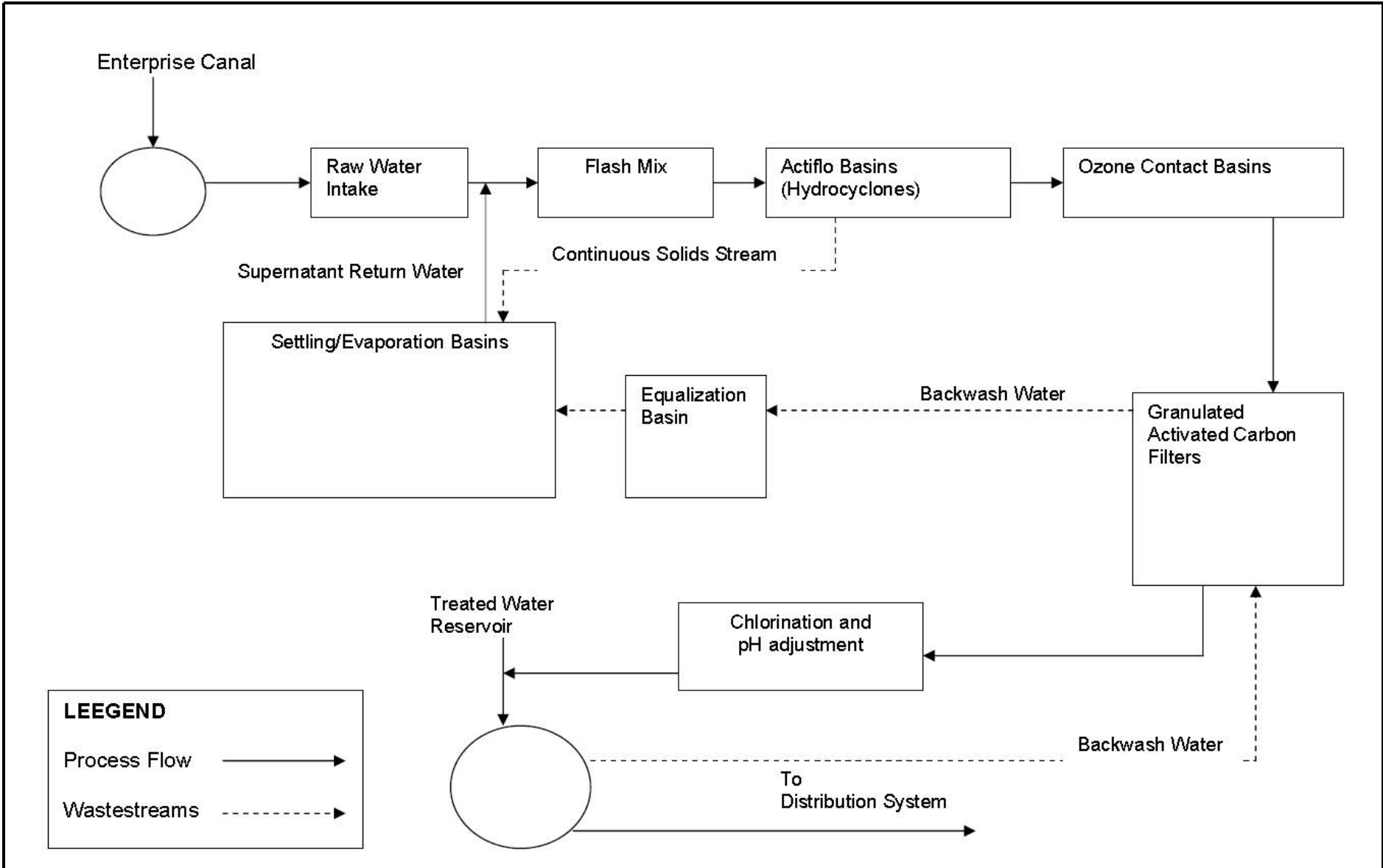
Willow Avenue

Map Source:
NAIP Aerial Photograph (2005)
SE 1/4 of Section 13, T12S, R20E, MDB&M



SITE MAP
ORDER NO. R5-2009-0121
WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF FRESNO
SURFACE WATER TREATMENT PLANT
FRESNO COUNTY

ATTACHMENT A



PROCESS FLOW DIAGRAM
 Order No. R5-2009-0121
 Waste Discharge Requirements
 For
 City of Fresno
 Surface Water Treatment Plant
 Fresno County