

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2009-0087

WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF BAKERSFIELD
WASTEWATER TREATMENT PLANT NO. 3
KERN COUNTY

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

1. The City of Bakersfield (Discharger) owns and operates Wastewater Treatment Plant No. 3 (WWTP No. 3), an existing plant which serves commercial, industrial, and residential developments in the western portion of the Bakersfield metropolitan area west of Highway 99. WWTP No. 3 is bounded by McCutcheon Road to the north, Gosford Road to the west, vacant land to the south, and Ashe Road to the east. WWTP No. 3 is one mile south of Panama Lane in the northeastern quadrant of Section 33, Township 30 S, Range 27 E, Mount Diablo Base & Meridian, Kern County, as shown on Attachment A, which is attached hereto and made part of this Order by reference.
2. The Discharger submitted a Report of Waste Discharge (RWD) including an Engineering Report in March 2001 in support of a proposed plant expansion and an increase in the discharge to land of wastewater from WWTP No. 3. Additional information was included in numerous soils and groundwater investigations including a November 2005 *Report of Analytical Results* prepared by Klienfelder; an April 2006 *Soil Sampling in the 400 Acre Parcel* prepared by Kenneth D Schmidt and Associates; and a September 2008 *Summary of Groundwater Conditions* prepared by Geocon.
3. The existing plant began operations in early 1972 and was regulated by Waste Discharge Requirements (WDRs) Order 72-92, which permitted a flow of 3.5 million gallons per day (mgd). Several WDRs have been since issued. Order 83-104 was issued on 28 January 1983 and permitted an increase in flow to 4.2 mgd. Order 85-103 was issued on 31 May 1985 and permitted an increase to 8.0 mgd. Order 88-167 was issued on 23 September 1988 and approved a two-phased increase in flow. Phase I included improvements that allowed an increase to 12 mgd, while Phase II allowed an increase to the current permitted flow (and the current design capacity of the WWTP) of 16 mgd.
4. The most recent WDRs (Order 5-01-105) were issued on 27 April 2001, primarily in response to changes in the discharge quality. Order 5-01-105 authorized the discharge to land of up to 16 mgd of undisinfectated secondary-treated effluent, the majority being pumped to an approximately 1,400-acre site about eight miles west of WWTP No. 3, which is designated as the I-5 Reclamation Site. Previously, the effluent was blended with industrial waste from a yeast plant, which occurred from the early 1970s until 1984. WDRs Order 83-016 regulated the yeast plant. From 1985 through 2002, the yeast plant discharged waste to 400 acres of City-owned land south of WWTP No. 3. These

practices resulted in an impact to both soil and groundwater. A salinity reduction plan was submitted by the yeast plant in October 2001 and the discharge of the yeast processing waste ceased completely in 2002. Mitigation measures described in a 2006 Environmental Impact Report for expansion of WWTP No. 3 include sampling and removal of contaminated soil and sampling of nearby domestic wells. In accordance with the EIR, contaminated soils in the area of the new percolation ponds were removed and reused to construct outer pond embankments and landscape berms. If any domestic well is found to be degraded by historical discharges from WWTP No. 3, an alternative source of potable water will be provided by the City. This Order is to regulate the current discharge from WWTP No. 3. Regulation of any investigation and cleanup of impacts from previous discharges will be addressed by a separate Cleanup and Abatement Order that would also involve other parties.

5. The I-5 Reclamation Site is owned by the City of Los Angeles and is bounded by Interstate Highway 5 on the east, Enos Lane on the west and Taft Highway on the north as shown in Attachment B, which is attached hereto and made part of this Order by reference. The I-5 Reclamation Site includes all land in Sections 1 and 12, T31S, R25E, MDB&M, and all portions of land in Sections 5, 6, 7, 8, 9, 15, 16, 17, and 18, T31S, R26E, MDB&M. The I-5 Reclamation Site is regulated by Order 88-172. The Discharger has a long-term agreement with the City of Los Angeles to receive WWTP No. 3 effluent at the I-5 Reclamation Site.
6. Order 5-01-105 is no longer adequate because it does not reflect the current conditions at WWTP No. 3, the expansion project, and the proposed disposal/recycling practices.

Existing Wastewater Treatment Plant

7. The existing treatment system consists of: two bar screens, a wet well, two aerated grit chambers, four primary clarifiers, four trickling filters, four secondary clarifiers, four effluent storage ponds (total capacity of about 1,140 acre-feet), six anaerobic digesters, an equalization lagoon, and about 20 acres of unlined sludge drying beds. Chemical addition of ferric chloride and polymers is conducted to enhance the primary settling process and increase plant efficiency.
8. In wet periods when the I-5 Reclamation Site cannot accept the wastewater, effluent is stored in the four effluent storage ponds at WWTP No. 3. The average volume of wastewater discharged daily from WWTP No. 3 since January 2007 is about 15.9 mgd or about 49 acre-feet per day. At the present percolation rates, the ponds can store effluent for nearly five months. Historically, even in the wet season, no more than three ponds have contained wastewater at any time.
9. Solids removed by the bar screens and materials collected from the grit chamber are disposed of at a sanitary landfill.

10. The RWD and self-monitoring data from January 2007 to December 2008 characterize the flows from WWTP No. 3 as follows:

Monthly Average Flow	15.8 mgd
Design Flow (daily dry weather average)	16.0 mgd
Peak Hourly Flow	32 mg
Highest Monthly Average Flow	16.8 mgd

11. Self-monitoring data from January 2007 to December 2008 characterize the quality of the discharge as follows:

<u>Constituent/Parameter</u>	<u>Units</u> ¹	<u>Influent</u>	<u>Effluent</u>	<u>% Removal</u> ²
Conventional Pollutants				
BOD ³	mg/L	341	48	86
CBOD ⁴	mg/L	NS ⁵	32	--
TSS ⁶	mg/L	315	32	90
Salts				
Chloride	mg/L	NS ⁵	75	--
Sodium	mg/L	NS ⁵	83	--
EC ⁷	µmhos/cm	NS ⁵	798	--
TDS ⁸	mg/L	NS ⁵	446	--
Nitrogen				
Nitrate as Nitrogen	mg/L	NS ⁵	0.46 ⁹	--
Total Nitrogen ¹⁰	mg/L	NS ⁵	27	--
Metals				
Arsenic	µg/L	NS ⁵	1.38	--
Iron	µg/L	NS ⁵	0.16	--
Manganese	µg/L	NS ⁵	0.01	--

¹ mg/L = milligrams per liter; µmhos/cm = micromhos per centimeter; µg/L = micrograms per liter

² Percent removal, -- = No data available

³ 5-day biochemical oxygen demand (BOD)

⁴ Carbonaceous biochemical oxygen demand (CBOD)

⁵ Not sampled (NS)

⁶ Total suspended solids (TSS)

⁷ Electrical conductivity at 25°C (EC)

⁸ Total dissolved solids (TDS)

⁹ Data reported as Nitrate. Converted to nitrate as nitrogen by dividing by a factor of 4.5.

¹⁰ Calculated by adding nitrate as nitrogen and total Kjeldahl nitrogen (TKN)

12. Order 5-01-105 prescribed effluent limitations on a monthly average basis for 5-day biochemical oxygen demand (BOD), total suspended solids (TSS), total dissolved solids (TDS), chloride, settleable solids, and electrical conductivity (EC); and required monthly sampling of effluent for nitrogen forms and quarterly sampling of metals, and general minerals.
13. The Discharger's self-monitoring reports (SMRs) indicate that it routinely exceeded the monthly average BOD limit of 40 milligrams per liter (mg/L) in 22 of 24 months between January 2007 and December 2008. However, the Discharger also samples for carbonaceous biochemical oxygen demand (CBOD) and compliance with the limits is based on meeting one (either/or) of the two analytical methods. CBOD concentrations exceeded the limit of 35 mg/L in nine of 24 monitoring events. TSS results exceeded the limit of 40 mg/L in five of the 24 months.
14. The EC of WWTP No. 3 effluent is typically about 450 micromhos per centimeter ($\mu\text{mhos/cm}$) greater than source water, which is less than the limit of 500 $\mu\text{mhos/cm}$ plus the EC of the source water. Self monitoring data from January 2007 through 2008 indicates that only one effluent sample was greater than 500 $\mu\text{mhos/cm}$ plus the EC of the source water.
15. The Discharger has a pretreatment program and submits quarterly reports. The United States Environmental Protection Agency approved the Discharger's initial pretreatment program in October 1985 and the State and Regional Water Boards received authority to administer the pretreatment regulations on 25 September 1989. The Discharger's 2007 Annual Pretreatment Report states that 618 inspections were conducted in 2007 that led to 234 sampling events. Based on the observations during the Discharger's inspections and the sample results, the Discharger issued nine notices of violation for exceeding various pretreatment limits.
16. The I-5 Reclamation Site has a reported maximum daily disposal capacity of 29 million gallons. In 2008, approximately 4,000 million gallons of effluent, or about 12,300 acre feet, was delivered to the I-5 Reclamation site. The effluent was used to irrigate about 3,300 acres of crops including wheat, alfalfa, corn, Sudan grass, milo, and oats.

Sludge Management and Biosolids Disposal

17. Sludge as used herein means the solid, semisolid, and liquid residues generated during the treatment of industrial and domestic sewage in a municipal wastewater treatment facility. Sludge includes solids removed during primary, secondary, or advanced wastewater treatment processes, but not grit or screening material generated at the headworks. Biosolids as used herein means sludge that has undergone treatment and subsequently been tested and shown to be capable of being beneficially useful and legally used pursuant to federal and state regulations as a soil amendment for agriculture, silviculture, horticulture, and land reclamation.

18. The Discharger currently dries sludge generated during the treatment process in 20 acres of unlined sludge drying beds. As part of the expansion project, the sludge drying beds will be removed and all sludge will be treated in new dewatering facilities and the resulting biosolids transported offsite.
19. The Discharger land applies biosolids generated from WWTP No. 3 at its reclamation area adjacent to Wastewater Treatment Plant No. 2, which is approximately seven miles to the northeast and regulated by WDR Order 97-104. The Discharger prepares Annual Land Management reports that document the amount of, and to which fields, biosolids are applied. The reclamation area contains about 5,000 acres of farmland for the application of biosolids.

Expansion Project

20. The expansion project is underway and the entire project is expected to be completed by April 2010. A new activated sludge system and upgraded secondary clarifiers will be completed and online by July 2009 and the effluent quality characterized in Finding 11 for the existing WWTP No. 3 is anticipated to improve because of the improvements to the treatment system.
21. The expanded WWTP No. 3 will have a new primary treatment system that includes new or upgraded conveyance lines, a grit removal system, and influent pumps. The influent will pass through improved bar screens that will remove large non-organic materials and then into a grit removal system where the heaviest materials settle out. Ferric chloride and other chemical coagulants will be added to the waste stream to help reduce hydrogen sulfide and to enhance settling. Foul air will be removed through air ducts and forced through a bio-filter bed made up of synthetic media or composted natural material. Separate odor control facilities will serve the headworks, primary clarifiers, and the solids handling facilities.
22. Primary treatment improvements include converting four existing secondary clarifiers to primary clarifiers where liquids and solids will be separated. Secondary treatment improvements include construction of two new anaerobic digesters; four new secondary clarifiers; and ten new covered aeration basins. The additions of the four new effluent storage ponds will double the storage capacity from the current 1,140 acre-feet to 2,280 acre-feet.
23. Upon completion of the expansion project, the treatment capacity of the plant will be as follows.

Design Flow (daily dry weather average)	32.0 mgd
Peak Hourly Flow	64.0 mg

The Discharger will continue to discharge up to 16 mgd of effluent to the I-5 Reclamation Site, and the remaining 16 mgd will be managed in the on-site effluent storage ponds that comprise about 2,280 acre-feet of storage. Additionally, the Discharger plans to construct a 2 mgd Tertiary Treatment facility to produce recycled water for use on nearby green belts and sports fields, and for onsite plant wash and makeup water.

Sanitary Sewer Overflows

24. A "sanitary sewer overflow" is defined as a discharge to ground or surface water from the sanitary sewer system at any point upstream of the plant. Temporary storage and conveyance facilities (such as wet wells, regulated impoundments, tanks, pipes, etc.) may be part of a sanitary sewer system and discharges to these facilities are not considered sanitary sewer overflows, provided that the waste is fully contained within these temporary storage/conveyance facilities.
25. On 2 May 2006, the State Water Resources Control Board (State Water Board) adopted Statewide General Waste Discharge Requirements for Sanitary Sewer Systems General Order 2006-003-DWQ (General Order). The General Order requires all public agencies that own or operate sanitary sewer systems greater than one mile in length to comply with the order. The Discharger's collection system is greater than one mile in length; therefore the General Order is applicable. The Discharger submitted a Notice of Intent (NOI) for coverage under the general permit to the State Water Resources Control Board in August 2008.

Water Recycling

26. Domestic wastewater contains pathogens harmful to humans that are typically measured by means of total or fecal coliform, as indicator organisms. California Department of Public Health (DPH), which has primary statewide responsibility for protecting public health, has established statewide criteria in Title 22, California Code of Regulations, Section 60301 et seq., (hereafter Title 22) for the use of recycled water and has developed guidelines for specific uses. Revisions of the water recycling criteria in Title 22 became effective on 2 December 2000. The revised Title 22 expands the range of allowable uses of recycled water, establishes criteria for these uses, and clarifies some of the ambiguity contained in the previous regulations.
27. A 1988 Memorandum of Agreement (MOA) between DPH (then called the Department of Health Services) and the State Water Resources Control Board on the use of recycled water establishes basic principles relative to the agencies and the regional water boards. Under terms of the MOA, the Board implements Title 22 and DPH recommendations for the protection of public health. In addition, the MOA allocates primary areas of responsibility and authority between these agencies, and provides for methods and mechanisms necessary to assure ongoing, continuous future coordination of activities relative to the use of recycled water in California.

28. Title 22 requires recyclers of treated municipal wastewater to submit an engineering report detailing the use of recycled water, contingency plans, and safeguards. The Discharger has submitted an engineering report for reclamation of its secondary treated wastewater, but has not submitted an engineering report for reuse of the tertiary treated wastewater.

Site-Specific Conditions

29. WWTP No. 3 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 discharge area are about 6 inches and 58 inches, respectively, according to information published by the California Department of Water Resources.
30. According to the USDA Natural Resources Conservation Service (USDA/NRCS) *Soil Survey, Kern County, Southwest Part*, soils in the area consist primarily of the Cajon sandy loam and the Kimberlina fine sandy loam. Permeability of the Cajon soil is rapid with percolation rates of 2.0 to 6.0 in the upper nine inches of soil and 6.0 to 20.0 in/hr below. Permeability of the Kimberlina soil is moderately slow with percolation rates of 2.0 to 6.0 in/hr in the upper nine inches of soil and 0.2 to 0.6 in/hr below nine inches.
31. The Cajon sandy loam is described as a Class IIIs-4 soil. Class III soils are soils with severe limitations that reduce the choice of plants or require special conservation practices. The 's' designates the soil as shallow, droughty, or stony, and the '4' indicates it has a low water capacity in sandy areas. The Cajon sandy loam is reportedly suitable for growing crops such as alfalfa, cotton, and sugar beets. The Kimberlina fine sandy loam soil is described as a Class IIs-6 soil and is saline/alkaline. Class II soils have moderate limitations and are reportedly suitable for salt tolerant crops such as cotton, alfalfa, and barley.
32. WWTP No. 3 is not within a 100-year floodplain according to Federal Emergency Management Agency Map 06029C2300E.
33. The Discharger is not required to obtain coverage under a National Pollutant Discharge Elimination System general industrial storm water permit for WWTP No. 3 because all storm water runoff is retained onsite and does not discharge to a water of the United States.
34. Land use in the vicinity of WWTP No. 3 is primarily agricultural, industrial, rural residential, with suburban housing projects encroaching from the north, west, and east. The primary crops grown within five miles of the treatment plant include grain and hay crops, pasture crops such as alfalfa, field crops such as cotton, vineyards, almonds, and native vegetation according to land use maps prepared by the Department of Water Resources. Irrigation water is supplied primarily by surface water.

Groundwater Considerations

35. Historically, groundwater monitoring indicated that the discharge had caused exceedances of some groundwater limitations, particularly constituents of salinity (e.g., EC, chloride, and sodium) and nitrate. This was primarily caused by the discharge of yeast processing waste that has since been discontinued.
36. Two groundwater zones are monitored beneath WWTP No. 3: a discontinuous perched zone and an unconfined aquifer. The Perched Groundwater Monitoring Network consists of six piezometers, designated P-2, P-5, P-6, P-7, P-8, and P-11 as shown on Attachment A. The Unconfined Groundwater Monitoring Network for the unconfined aquifer consists of nine groundwater monitoring wells, designated MW-1 through MW-9, as shown on Attachment A.
37. Groundwater in the perched or discontinuous zone was generally not encountered during most of the 2007 and 2008 quarterly monitoring events. Where it was encountered, the depth ranged from about 13 to 25 feet below the ground surface (bgs). Historically, depths to perched groundwater have ranged from about 11 to 38 feet bgs.
38. Depth to unconfined groundwater in 2007 and 2008 ranged from about 126 to 149 feet bgs. The direction of groundwater flow in the unconfined aquifer is somewhat variable due to mounding under the effluent storage ponds. Regional flow is to the east/southeast.
39. The Discharger submitted a work plan to install additional groundwater monitoring wells in June 2008. The Discharger will install three additional first encountered groundwater monitoring wells: one at the southeast corner of the new effluent storage ponds and two along the eastern and downgradient property boundary.

Source Water Quality

40. Water is supplied to the WWTP No. 3 service area by 91 wells. The water purveyor monitors these wells at least every three years for inorganic constituents. In 2007, the 12-month flow weighted average EC, based on monthly flow data was 306 $\mu\text{mhos/cm}$. The table below is from the City's 2007 Annual Water Quality Report, which averages all the wells supplying the City of Bakersfield, not just the area served by WWTP No. 3.

<u>Constituent/Parameter</u>	<u>Units</u>	<u>Average</u>	<u>Range</u>
Arsenic	$\mu\text{g/L}$	3	ND-9.8
Chloride	mg/L	21	6-82
Sodium	mg/L	31	14-97
EC	$\mu\text{mhos/cm}$	290	160-730
Nitrate (as NO_3)	mg/L	4.8	ND-23
TDS	mg/L	178	98-450

Basin Plan, Beneficial Uses, and Water Quality Objectives

41. The *Water Quality Control Plan for the Tulare Lake Basin, 2nd Edition*, (hereafter Basin Plan) designates beneficial uses, establishes numerical and narrative 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 Board. Pursuant to Section 13263(a) of the California Water Code (CWC), these waste discharge requirements implement the Basin Plan.
42. Water in the Tulare Lake Basin is in short supply, requiring importation of surface water from other parts of the State. The Basin Plan encourages recycling on irrigated crops wherever feasible and indicates that evaporation of recyclable wastewater is not an acceptable permanent disposal method where the opportunity exists to replace existing uses or proposed use of fresh water with recycled water.
43. WWTP No. 3 is in Detailed Analysis Unit (DAU) 254 within the Kern County Basin. The Basin Plan designates the beneficial uses of groundwater in this DAU as municipal and domestic supply, agricultural supply, industrial process and service supply, water contact recreation, and wildlife habitat.
44. WWTP No. 3 is in the South Valley Floor Hydrologic Unit and the Kern Delta Hydrologic Area. The Basin Plan designates the beneficial uses of surface water (Valley Floor Waters) as agricultural supply; industrial process and service supply; water contact recreation; non-contact water recreation; warm freshwater habitat; wildlife habitat; rare, threatened, or endangered species; and groundwater recharge.
45. The Basin Plan includes a water quality objective for chemical constituents that, at a minimum, require waters designated as domestic or municipal supply to meet the applicable MCLs specified in Title 22. The Basin Plan recognizes that the Regional 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.
46. 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.
47. The Basin Plan identifies the greatest long-term water quality problem facing the entire Tulare Lake Basin as the increase in salinity in groundwater, which has been accelerated due to man's activity. The Basin Plan recognizes that degradation is unavoidable until there is a long-term solution to the salt imbalance. Until then, 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 or limited to a maximum of 1,000 $\mu\text{mhos/cm}$. 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 groundwaters shall not exceed an EC of 1,000 $\mu\text{mhos/cm}$, a chloride content of 175 mg/L, or boron content of 1.0 mg/L.

These effluent limits are considered reflective of best practicable treatment or control (BPTC).

48. The list of crops in Finding 34 is not intended as a definitive inventory of crops that are or could be grown in the area affected by the discharge, but is representative. Crops sensitive to salt and boron are currently not being grown in the area.
49. The Basin Plan requires municipal wastewater treatment facilities that discharge to land to comply with treatment performance standards for BOD and TSS. Facilities that preclude public access and are greater than one (1) mgd must provide removal of 80 percent or reduction to 40 mg/L, whichever is more restrictive, of both BOD₅ and TSS.

Antidegradation

50. State Water Resources Control Board Resolution 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 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.
51. Degradation of groundwater by some of the typical waste constituents released with discharge from a municipal wastewater utility after effective source control, treatment, and control is consistent with maximum benefit to the people of the State. The technology, energy, and waste management advantages of municipal utility service far exceed any benefits derived from a community otherwise reliant on numerous concentrated individual wastewater systems, and the impact on water quality 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 the terms of the Basin Plan are met.

52. Recent values in well MW-3, which is directly downgradient of the treatment facility and effluent storage ponds, and appears to best represent current conditions, indicate that, with the exception of sodium, groundwater beneath the facility meets the existing groundwater limitations contained in WDR Order 5-10-105. The new treatment system includes denitrification, and combined with the current groundwater concentrations, nitrogen in groundwater is not anticipated to be an issue in the future.
53. The current WDRs set restrictive groundwater limits for salt including a groundwater limitation for sodium of 69 mg/L, which is based on protection of sprinkler-irrigated, salt-sensitive crops. However, review of various reports (USDA, *Soil Survey of Kern County: Northwestern Part*; Ayers and Westcott, *Water Quality for Agriculture*; Asano, *Wastewater Reclamation and Reuse*) and land use maps showing crops grown in the region, indicates soils in the area are not conducive to growing salt-sensitive crops, and that salt sensitive crops are not grown in the area.
- Ayers and Westcott indicate sodium concentrations up to 70 mg/L have no restrictions for salt-sensitive crops and concentrations from 70 to 210 mg/L have only slight to moderate restrictions. The average sodium concentration in effluent from WWTP No. 3 has been about 83 mg/L since 2007 and was about 78 mg/L in 2008. Based on this information and the information presented in Finding 31, the sodium concentration in the discharge will not unreasonably affect the receiving groundwater's present and anticipated beneficial uses for agricultural or drinking water or result in groundwater quality exceeding water quality objectives.
54. In general, the future discharge will have less impact on water quality than the previously permitted discharge, as summarized below.
- Nitrate as nitrogen concentrations will be reduced to less than the Primary MCL of 10 mg/L;
 - EC values average about 800 $\mu\text{mhos/cm}$, which is less than the lowest Secondary MCL of 900 $\mu\text{mhos/cm}$;
 - Sodium concentrations average about 80 mg/L, which does not restrict usage for the area's agriculture or as a drinking water source.
55. This Order establishes new groundwater limits for WWTP No. 3 that are performance based and 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. This Order contains requirements for a groundwater assessment for assuring that the highest water quality consistent with the maximum benefit to the people of the State will be achieved.

Treatment and Control Practices

56. The Expansion project described in Findings 20 through 23, once completed, will provide treatment and control of the discharge that incorporates:

- a. Alarms and operational procedures to minimize and prevent bypass or overflow;
- b. Secondary treatment of up to 30 mgd of wastewater;
- c. Tertiary treatment of up to 2 mgd of wastewater;
- d. Nitrogen reduction;
- e. Recycling of wastewater on crops and landscaping;
- f. Odor control;
- g. An Industrial Pretreatment program;
- h. Appropriate biosolids disposal practices; and
- i. The use of certified operators to ensure proper operation and maintenance.

Other Regulatory Considerations

57. The United States Environmental Protection Agency (EPA) has promulgated biosolids reuse regulations in Title 40, Code of Federal Regulations, Part 503, Standards for the Use or Disposal of Sewage Sludge, which establishes management criteria for protection of ground and surface waters, sets application rates for heavy metals, and establishes stabilization and disinfection criteria. The Discharger may have separate and/or additional compliance, reporting, and permitting responsibilities to EPA.
58. The California Department of Water Resources sets standards for the construction and destruction of groundwater wells, as described in the *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.
59. Title 27 Section 20090(a) exempts discharges of domestic sewage 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.
60. As the discharge consists of treated municipal sewage and incidental discharges from treatment and storage facilities associated with a municipal wastewater treatment plant and as these discharges are regulated by waste discharge requirements consistent with applicable water quality objectives, the Facility and its discharge are exempt from containment pursuant to Title 27, Section 20090(a).

CEQA

61. The Discharger prepared an Initial Study/Environmental Checklist for the proposed expansion to 32 mgd in March 2006 that concluded an EIR was required. The Discharger prepared and circulated a draft EIR in October 2006 and certified it on 10 January 2007. The EIR identified significant and potentially significant threats to hydrology and water quality, and included mitigation measures to alleviate the anticipated threats. The EIR also included mitigation measures to address impacts from historical discharges. Staff has reviewed the EIR and concurs with the findings and mitigation measures therein.
62. This Order implements measures necessary to mitigate any adverse impacts to groundwater from the Expansion project to less than significant levels, including:
- Effluent Limit B.10, which stipulates waste constituents cannot be released or discharged in a concentration or mass that causes violation of the Order's groundwater limitations.
 - Effluent Limit B.3, which establish effluent limitations consistent with the Basin Plan's performance standards.
 - Discharge Specification B.1.a, which restricts flow to 16 mgd until the Discharger can treat and dispose of the proposed increase in accordance with the terms and conditions of this Order and the CWC.

General Findings

63. 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.
64. The Regional Water Board will review this Order periodically and will revise requirements when necessary.
65. California Water Code Section 13267(b) states that: "In conducting an investigation specified in subdivision (a), the Regional 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 Regional 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 Regional 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."

66. The technical reports required by this Order and the attached Monitoring and Reporting Program R5-2009-0087 are necessary to assure compliance with these waste discharge requirements. The Discharger operates the Facility that discharges the waste subject to this Order.

Public Notice

67. 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.

68. 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.

69. All comments pertaining to the discharge were heard and considered in a public meeting.

IT IS HEREBY ORDERED that Waste Discharge Requirements Order 5-01-105 is rescinded and that, pursuant to Sections 13263 and 13267 of the CWC, the City of Bakersfield and its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the CWC and regulations adopted thereunder, shall comply with the following:

A. Discharge Prohibitions

1. Discharge of wastes to surface waters or surface water drainage courses is prohibited.
2. Bypass or overflow of untreated wastes, except as allowed by Provision E.2 of Standard Provisions and Reporting Requirements, is prohibited.
3. 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.

B. Effluent Limitations

1. The monthly average discharge flow shall not exceed:
 - a. 16 mgd until the Discharger has completed the expansion activities and complied with Provisions H.15 and H.16.
 - b. 32 mgd (combined secondary and disinfected tertiary treated wastewater) after the requirements of Provisions H.15 and H.16 have been satisfied and approved by the Executive Officer.

2. Prior to **1 January 2010**, the discharge to the Storage Ponds or to the I-5 Reclamation Site (i.e., Secondary Recycled Water) shall not exceed the following limitations:

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
CBOD ¹	mg/L	35	70
TSS ²	mg/L	40	80

¹ Carbonaceous five-day biochemical oxygen demand

² Total suspended solids

The arithmetic mean of CBOD and TSS in effluent samples collected over a monthly period shall not exceed 20 percent of the arithmetic mean of the values for influent samples collected at the same times during the same period (80 percent removal).

3. After **1 January 2010**, the discharge to the Storage Ponds or to the I-5 Reclamation Site (i.e., Secondary Recycled Water) shall not exceed the following limitations:

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
BOD ¹	mg/L	40	80
TSS	mg/L	40	80

¹ Five-day biochemical oxygen demand

The arithmetic mean of BOD and TSS in effluent samples collected over a monthly period shall not exceed 20 percent of the arithmetic mean of the values for influent samples collected at the same times during the same period (80 percent removal).

4. Disinfected Tertiary Recycled Water shall not exceed the following limitations:

<u>Constituent</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Daily Maximum</u>
BOD	mg/L	10	20
TSS	mg/L	10	20

The arithmetic mean of BOD and TSS in effluent samples collected over a monthly period shall not exceed 10 percent of the arithmetic mean of the values for influent samples collected at the same times during the same period (90 percent removal).

5. The monthly average concentration of total nitrogen in the discharge shall not exceed 10 mg/L, unless the effluent is recycled directly from the WWTF (i.e., not stored in a surface impoundment first) or unless the requirements of Provision H.12 have been satisfied and approved by the Executive Officer.
6. The median concentration of total coliform organisms in Disinfected Tertiary Recycled Water shall not exceed the following (Title 22, Section 60301.230):

- a. a most probable number (MPN) of 2.2 total coliform bacteria per 100 milliliters utilizing the bacteriological results of the last seven days for which the analyses have been completed;
 - b. an MPN of 23 total coliform bacteria per 100 milliliters in more than one sample in any 30-day period; and
 - c. an MPN of 240 total coliform bacteria per 100 milliliters at any time.
7. The turbidity of Disinfected Tertiary Recycled Water that is coagulated and passed through undisturbed soil or a filter media shall not exceed the following (Title 22, Section 60301.320):
- a. an average of 2.0 NTU within a 24-hour period;
 - b. 5.0 NTU more than five percent of the time within a 24 hour period; and
 - c. 10 NTU at any time.
8. The turbidity of Disinfected Tertiary Recycled Water that is passed through a microfiltration, ultrafiltration, nanofiltration, or reverse osmosis membrane shall not exceed the following (Title 22, Section 60301.320):
- a. 0.2 NTU more than five percent of the time within a 24 hour period; and;
 - b. 0.5 NTU at any time.
9. The 12-month rolling average EC of the discharge shall not exceed the 12-month rolling average EC of the source water plus 500 μ mhos/cm. Compliance with this effluent limitation shall be determined monthly.
10. 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.

C. Discharge Specifications

1. 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.
2. Public contact with effluent shall be precluded through such means as fences, signs, or acceptable alternatives.
3. Objectionable odors shall not be perceivable beyond the limits of WWTP No. 3 property at an intensity that creates or threatens to create nuisance conditions.
4. Effluent disposal ponds shall have sufficient capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration

during the winter. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.

5. On or about **1 October** of each year, available disposal pond storage capacity shall at least equal the volume necessary to comply with Discharge Specification C.4.
6. Ponds shall be managed to prevent breeding of mosquitoes. In particular,
 - a. An erosion control plan should assure that coves and irregularities are not created around the perimeter of the water surface.
 - b. Weeds shall be minimized through control of water depth, harvesting, and herbicides.
 - c. Dead algae, vegetation and other debris shall not accumulate on the water surface.
 - d. Vegetation management operations in areas in which nesting birds have been observed shall be carried out either before or after, but **not during**, the April 1 to June 30 bird nesting season.

D. Recycling Specifications

The following specifications apply to use areas under the ownership or control of the Discharger. Other use areas are covered by separate water recycling requirements.

1. Recycled water shall be managed in conformance with the regulations contained in Title 22, Division 4, Chapter 3, CCR.
2. Use of Secondary Recycled Water shall be limited to flood irrigation of fodder, fiber, seed crops not eaten by humans or for grazing of non-milking cattle and shall comply with the provisions of Title 22.
3. All reclamation equipment, pumps, piping, valves, and outlets shall be appropriately marked to differentiate them from potable facilities. All reclamation distribution system piping shall be purple or adequately wrapped with purple tape.
4. Recycled water controllers, valves, and similar appurtenances shall be affixed with recycled water warning signs, and shall be equipped with removable handles, locking mechanisms, or some other means to prevent public access or tampering. The contents of the signs shall conform to Title 22, CCR, Section 60310. Quick couplers and sprinkler heads, if used, shall be of a type, or secured in a manner, that permits operation only by authorized personnel. Hose bibs that the public could use shall be eliminated.

5. Public contact with recycled water shall be controlled using signs and/or other appropriate means. All areas where recycled water is used that are accessible to the public shall be posted with signs that are visible to the public, in a size no less than 4 inches high by 8 inches wide, that include the following wording: "RECYCLED WATER – DO NOT DRINK, AGUA DE DESPERDICIO RECLAMADA – NO TOME" Each sign shall display an international symbol similar to that shown in Attachment C.
6. Recycled water shall not be allowed to escape from the authorized use areas by airborne spray or by surface flow except in minor amounts such as that associated with good irrigation practices.
7. Spray, mist, or runoff shall not enter dwellings, designated outdoor eating areas, or food handling facilities.
8. Drinking water fountains shall be protected against contact with recycled water spray, mist, or runoff.
9. Workers shall be educated regarding proper hygienic procedures to ensure personal and public safety.
10. Potable water mains shall be separated by a clear horizontal distance of at least four feet from, and a clear vertical distance of at least one foot above, any parallel pipeline conveying disinfected tertiary recycled water, and shall be separated by a clear vertical distance of at least one foot above any crossing pipeline conveying disinfected tertiary recycled water, except as may be otherwise allowed or approved under DPH regulatory requirements or DPH design guidance documents. All separation distances shall be measured from the nearest outside edge of each pipe. Vertical separation distances shall apply wherever the horizontal separation distance is eleven feet or less.
11. Potable water supply piping and recycled water piping shall not have any cross-connections. Supplementing recycled water with potable water shall not be allowed except through an air-gap separation or, if approved by the DPH, a reduced pressure principle backflow device.
12. Application of recycled water to recycled water use areas shall not exceed the nitrogen or hydraulic loading reasonably necessary to satisfy the nitrogen or water uptake needs of the use area considering the plant, soil, climate, and irrigation management system (i.e., generally accepted agronomic rates).
13. Areas irrigated with recycled water shall be managed to prevent breeding of mosquitoes. More specifically:
 - a. All applied irrigation water must infiltrate completely within 48 hours.

- b. Ditches receiving irrigation runoff not serving as wildlife habitat should be maintained free of emergent, marginal, and floating vegetation.
- c. Low-pressure and un-pressurized pipelines and ditches, which are accessible to mosquitoes, shall not be used to store recycled water.

14. The Discharger shall maintain the following setback distances from areas where Secondary Recycled Water is impounded or irrigated with:

<u>Setback Distance (feet)</u>	<u>To</u>
15	Property Line
20	Public Roads
50	Drainage courses
100	Irrigation wells
150	Domestic wells

- 15. No irrigation with Disinfected Tertiary Recycled Water shall take place within 50 feet of any active domestic water supply well, or any inactive well if it is a stand-by well for a drinking water supply.
- 16. No impoundment of Disinfected Tertiary Recycled Water shall occur within 100 feet of any domestic water supply well.
- 17. Any irrigation runoff shall be confined to the recycled water use area, and shall not enter any surface water drainage course or stormwater drainage system unless the runoff does not pose a public health threat and is authorized by the regulatory agency.

E. Sludge Specifications

- 1. Sludge and solid waste shall be removed from screens, sumps, aeration basins, ponds, clarifiers, etc. as needed to ensure optimal plant operation.
- 2. Any handling and storage of residual sludge, solid waste, and biosolids on property of WWTP No. 3 shall be temporary (i.e., no longer than two years) 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.
- 3. Residual sludge, biosolids, and solid waste 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, 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.

4. Use of biosolids as a soil amendment shall comply with valid waste discharge requirements issued by a regional water quality control board or State Water Board or a local (e.g., county) program authorized by a regional water quality control board. In most cases, this means the General Biosolids Order (State Water Board Water Quality Order 2004-12-DWQ, "General Waste Discharge Requirements for the Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvicultural, Horticultural, and Land Reclamation Activities"). For a biosolids use project to be authorized by the General Biosolids Order, the Discharger must file a complete Notice of Intent and receive a Notice of Applicability for each project.
5. Any proposed change in sludge use or disposal practice shall be reported in writing to the Executive Officer at least 90 days in advance of the change.

F. Pretreatment Requirements

1. The Discharger shall implement the necessary legal authorities, programs, and controls to ensure that the following incompatible wastes are not introduced to the treatment system, where incompatible wastes are:
 - a. Wastes that create a fire or explosion hazard in the treatment works;
 - b. Wastes that will cause corrosive structural damage to treatment works, but in no case wastes with a pH lower than 5.0, unless the works is specially designed to accommodate such wastes;
 - c. Solid or viscous wastes in amounts that cause obstruction to flow in sewers, or which cause other interference with proper operation or treatment works;
 - d. Any waste, including oxygen demanding pollutants (BOD, etc.), released in such volume or strength as to cause inhibition or disruption in the treatment works, and subsequent treatment process upset and loss of treatment efficiency;
 - e. Heat in amounts that inhibit or disrupt biological activity in the treatment works, or that raise influent temperatures above 40°C (104°F), unless the treatment works is designed to accommodate such heat;
 - f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;
 - g. Pollutants that result in the presence of toxic gases, vapors, or fumes within the treatment works in a quantity that may cause acute worker health and safety problems; and
 - h. Any trucked or hauled pollutants, except at points predesignated by the Discharger.
2. The Discharger shall implement the legal authorities, programs, and controls necessary to ensure that indirect discharges do not introduce pollutants into the sewerage system that, either alone or in conjunction with a discharge or discharges from other sources:

- a. Flow through the system to the receiving water in quantities or concentrations that cause a violation of this Order, or
- b. Inhibit or disrupt treatment processes, treatment system operations, or sludge processes, use, or disposal and either cause a violation of this Order or prevent sludge use or disposal in accordance with this Order.

G. Groundwater Limitations

1. Release of waste constituents from any treatment or storage component associated with WWTP No. 3 shall not cause or contribute to groundwater:
 - a. Containing concentrations of constituents identified below, or background quality, whichever is greater.
 - (i) Nitrate as nitrogen of 10 mg/L.
 - (ii) Electrical Conductivity of 900 µmhos/cm.
 - (iii) Total Coliform Organisms of 2.2 MPN/100 mL.
 - (iv) For constituents identified in Title 22, the Primary and Secondary 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.

H. 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(s).
2. The Discharger shall comply with Monitoring and Reporting Program (MRP) R5-2009-0087, which is part of this Order, and any revisions thereto as adopted by the Regional 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 at WWTP No. 3, a copy of this Order, 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 shall not allow pollutant-free wastewater to be discharged into the Facility collection, treatment, and disposal systems in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater

means storm water (i.e., inflow), groundwater (i.e., infiltration), cooling waters, and condensates that are essentially free of pollutants.

5. 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.
6. All technical reports and work plans 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 and work plans 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.
7. 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 Regional 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 Regional Water Board by letter when it returns to compliance with the time schedule. Violations may result in enforcement action, including Regional Water Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.
8. 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 Regional Water Board office.
9. 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 Regional 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 Regional Water Board for its consideration of transferring the ownership of this Order at one of its regularly scheduled meetings.

10. As a means of discerning compliance with Discharge Specification C.3, the dissolved oxygen (DO) content in the upper one foot of any wastewater pond shall not be less than 1.0 mg/L for three consecutive days. Should the DO be below 1.0 mg/L during a weekly sampling event, the Discharger shall take all reasonable steps to correct the problem and commence daily DO monitoring in all affected ponds until the problem has been resolved. If unpleasant odors originating from affected ponds are noticed in developed areas, or if the Discharger receives one or more odor complaints, the Discharger shall report the findings in writing within 5 days of that date and shall include and a specific plan to resolve the low DO results to the Regional Water Board within 10 days of that date.
11. The pH of the discharge shall not be less than 6.5 or greater than 8.3 pH units for more than three consecutive sampling events. In the event that the pH of the discharge is outside of this range for more than three consecutive sampling events, the Discharger shall submit a technical evaluation in its monthly SMRs documenting the pH of the discharge to the reclamation area, and if necessary demonstrate that the effect of the discharge on soil pH will not exceed the buffering capacity of the soil profile.
12. The Discharger shall comply with the effluent total nitrogen limitation of 10 mg/L (Effluent Limitation B.5), or alternatively, the Discharger shall submit a design report and performance demonstration for the storage ponds at the Reclamation Area. The performance demonstration shall establish that the pond design will be protective of groundwater quality and that seepage from the ponds will not contribute to nitrogen in groundwater exceeding groundwater limitations. This provision will be considered satisfied following written acknowledgement from the Executive Officer.
13. 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.

14. The Discharger shall submit the technical reports and work plans required by this Order for Regional Water Board staff consideration and incorporate comments they may have in a timely manner, as appropriate. The Discharger shall proceed with all work required by the following provisions by the due dates specified.
15. Upon completion of the proposed expansion activities described in Findings 20 through 23, the Discharger shall submit an engineering certification that it has sufficient treatment, storage, and disposal capacity to comply with the other terms and conditions of this Order. This provision will be considered satisfied following written acknowledgement from the Executive Officer that the criteria have been met.
16. **By 1 October 2009**, the Discharger shall submit a Title 22 Engineering Report for the proposed recycling of disinfected tertiary recycled wastewater described in Finding 23 in accordance with CCR Title 22 Section 60323. The report shall include a detailed Use Area Management Plan or the Discharger shall submit a Use Area Management Plan concurrently by the indicated date.
17. **By 1 October 2009**, the Discharger shall submit a report documenting the installation and sampling of the three additional groundwater monitoring wells described in Finding 39.
18. **By 1 October 2009**, the Discharger shall conduct a salinity evaluation and submit a salinity minimization plan to identify and implement measures to reduce the salinity in discharge to the extent feasible. The salinity minimization plan shall include a time schedule to implement the identified measures.

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 13 August 2009.


PAMELA C. CREEDON, Executive Officer

Order Attachments:

- Monitoring and Reporting Program
- A. Vicinity Map – WWTP No. 3
- B. I-5 Reclamation Site Map
- C. International Symbol for Recycled Water Information Sheet
- Standard Provisions (1 March 1991)

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2009-0087

FOR
CITY OF BAKERSFIELD
WASTEWATER TREATMENT PLANT NO. 3
KERN 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 9 and a list of the constituents required for the monitoring of Priority Pollutants is included in Table 1, which is on page 10.

INFLUENT MONITORING

Influent samples shall be collected at the inlet of the headworks at approximately the same time as the effluent samples. Influent 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
Continuous	pH	pH Units	Meter
Weekly	BOD ₅	mg/L	24-hour composite
Weekly	TSS	mg/L	24-hour composite
Monthly	Monthly Average Flow	mgd	Computed

EFFLUENT MONITORING

Effluent samples shall be collected just prior to discharge to the storage reservoirs or to the reclamation areas. Effluent monitoring shall include at least the following:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Daily ¹	pH	pH Units	Grab
Twice Weekly	EC	umhos/cm	24-hour composite ²
Twice Weekly	BOD ₅	mg/L	24-hour composite ²
Twice Weekly	CBOD	mg/L	24-hour composite ²
Twice Weekly	TSS	mg/L	24-hour composite ²
Monthly	Nitrate as N	mg/L	24-hour composite ²
Monthly	TKN	mg/L	24-hour composite ²
Monthly	Ammonia	mg/L	24-hour composite ²
Monthly	Total Nitrogen	mg/L	Computed
Monthly	TDS	mg/L	24-hour composite ²
Monthly	Chloride	mg/L	24-hour composite ²
Monthly	Sodium	mg/L	24-hour composite ²
Annually ³	General Minerals	mg/L	24-hour composite ²
Annually ³	Priority Pollutants (see Table 1)	Varies ³	Varies

¹ Excluding weekends and holidays.

² Time-proportioned composite is acceptable.

³ Sampling may coincide with timing of pretreatment sampling.

⁴ mg/L or ug/L, as appropriate.

In addition to the analyses listed above, effluent from the tertiary treatment plant that is used on nearby green belts or otherwise recycled shall be additionally analyzed for the following:

<u>Frequency</u> ¹	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Continuous	Turbidity	NTU	Meter
Daily	Total Coliform Organisms	MPN/100 mL	Grab

¹ Whenever Disinfected Tertiary Recycled Water is discharged into the storage tank.

POND MONITORING

Effluent pond monitoring shall include at least the following:

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

¹ To nearest tenth of a foot

Permanent markers (e.g., staff gauges) shall be placed in storage ponds. The markers shall have calibrations indicating water level at the design capacity and available operational freeboard.

The Discharger shall inspect the condition of the disposal ponds once per week and write visual observations in a bound logbook. Notations shall include observations of whether weeds are developing in the water or along the bank, and their location; whether dead algae, vegetation, scum, or debris are accumulating on the disposal pond surface and their location; whether burrowing animals or insects are present; and the color of the reservoirs (e.g., dark sparkling green, dull green, yellow, gray, tan, brown, etc.).

PERCHED GROUNDWATER MONITORING

The Discharger shall monitor all piezometers in its Perched Groundwater Monitoring Network, and any additional piezometers installed pursuant to this MRP, for the following:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Quarterly	Depth to groundwater	Feet ¹	Measured
Quarterly	Groundwater Elevation	Feet ²	Computed
Quarterly	EC	umhos/cm	Grab

¹ To nearest tenth of a foot

² To nearest tenth of a foot above Mean Sea Level

UNCONFINED GROUNDWATER MONITORING

After measuring water levels and prior to collecting samples, each monitoring well shall be adequately purged to remove water that has been standing within the well screen and casing that may not be chemically representative of formation water. Depending on the hydraulic conductivity of the geologic setting, the volume removed during purging is typically from 3 to 5 volumes of the standing water within the well casing and screen, or additionally the filter pack pore volume.

The Discharger shall monitor all wells in its Unconfined Groundwater Monitoring Network, and any additional wells installed pursuant to this MRP, for the following:

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Quarterly	Depth to groundwater	Feet ¹	Measured
Quarterly	Groundwater Elevation	Feet ²	Computed
Quarterly	pH	pH Units	Grab
Quarterly	EC	umhos/cm	Grab
Quarterly	Nitrate	mg/L (as N)	Grab
Quarterly	Total Nitrogen	mg/L	Grab
Quarterly	Total Organic Carbon	mg/L	Grab
Quarterly	TDS	mg/L	Grab
Quarterly	Chloride	mg/L	Grab
Quarterly	Sodium	mg/L	Grab
Quarterly	Arsenic	ug/L	Grab
Quarterly	Iron	ug/L	Grab
Quarterly	Manganese	ug/L	Grab
Annually	General Minerals	mg/L	Grab

¹ To nearest tenth of a foot

² To nearest tenth of a foot above Mean Sea Level

SOURCE WATER MONITORING

For each source (either well or surface water supply), the Discharger shall calculate the flow-weighted average concentrations for the specified constituents utilizing monthly flow data and the most recent chemical analysis conducted in accordance with Title 22 drinking water requirements. Alternatively, the Discharger may establish representative sampling stations within the distribution system serving the same area as is served by WWTP No. 3.

<u>Frequency</u>	<u>Constituent/Parameter</u>	<u>Units</u>	<u>Sample Type</u>
Monthly	EC	mg/L	Computed average
Annually	General Minerals	mg/L	Computed average

SLUDGE MONITORING

Sludge shall be sampled for the following constituents:

Arsenic	Lead	Nickel
Cadmium	Mercury	Selenium
Copper	Molybdenum	Zinc
Organic Nitrogen	Ammonia Nitrogen	Total Solids

Monitoring shall be conducted as required in Title 40 of the Code of Federal Regulations (40 CFR), Part 503.8(b)(4). The constituents listed above shall be monitored at the following frequency, depending on volume of sludge generated:

<u>Volume Generated (dry metric tons/year)</u>	<u>Frequency</u>
0 to 290	Annually
290 to 1,500	Quarterly
1,500 to 15,000	Bimonthly (six samples per year)
Greater than 15,000	Monthly

The Discharger shall demonstrate that treated sludge (i.e., biosolids) meets Class A or Class B pathogen reduction levels by one of the methods listed in 40 CFR, Part 503.32.

The Discharger shall track and keep records of the operational parameters used to achieve Vector Attraction Reduction requirements in 40 CFR, Part 503.33(b).

REPORTING

All monitoring results shall be reported in **Quarterly Monitoring Reports** which are due by the first day of the second month after the calendar quarter. Therefore, monitoring reports are due as follows:

- First Quarter Monitoring Report: **1 May**
- Second Quarter Monitoring Report: **1 August**
- Third Quarter Monitoring Report: **1 November**
- Fourth Quarter Monitoring Report: **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 reports, as well as report transmittal letters:

Discharger Name
Facility Name
Monitoring and Reporting Program Number
Contact Information (telephone 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 WWTF 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 Quarterly Monitoring Reports shall include the following:

Wastewater reporting:

1. The results of influent, effluent, and pond monitoring specified on pages 2 and 3.
2. For each month of the quarter, calculation of the maximum daily flow and the monthly average flow.
3. For each month of the quarter, calculation of the 12-month rolling average EC of the discharge using the EC value for that month averaged with the EC values for the previous 11 months.

4. For each month of the quarter, calculation of the monthly average effluent BOD and TSS concentrations, and calculation of the percent removal of BOD and TSS compared to the influent.
5. A summary of the notations made in the pond monitoring log during each quarter. The entire contents of the log do not need to be submitted.

Groundwater reporting:

1. The results of perched and unconfined groundwater monitoring specified on pages 3 and 4.
2. For each monitoring well, a table showing constituent concentrations for at least five previous years, up through the current quarter.
3. A groundwater contour map based on groundwater elevations for that quarter. The map shall show the gradient and direction of groundwater flow under/around the facility and/or effluent disposal area(s). The map shall also include the locations of monitoring wells and wastewater storage and discharge areas.

Source water reporting, including the results of EC monitoring specified on page 4, and supporting calculations.

B. Fourth Quarter Monitoring Reports, in addition to the above, shall include the following:

Pretreatment reporting in accordance with Standard Provision E.7 and describing progress towards correction of any deficiencies noted during audit or pretreatment compliance inspections by the Central Valley Water Board or U.S. EPA. Signed copies of the pretreatment reports shall also be submitted to U.S. EPA, Region 9 and the State Water Board.

Wastewater treatment facility information:

1. The names, certificate grades, and general responsibilities of all persons in charge of wastewater treatment and disposal.
2. The names and telephone numbers of persons to contact regarding the WWTF for emergency and routine situations.
3. 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).
4. A statement whether the current operation and maintenance manual, sampling plan, and contingency plan, reflect the WWTF as currently constructed and operated, and the dates when these documents were last reviewed for adequacy.
5. The results of an annual evaluation conducted pursuant to Standard Provision E.4 and a figure depicting monthly average discharge flow for the previous five calendar years.

Sludge sampling records shall be retained for a minimum of five years in accordance with 40 CFR, Part 503.17. A log shall be kept of sludge quantities generated and of handling, application, and disposal activities. The frequency of entries is discretionary; however, the log should be complete enough to serve as a basis to report sludge monitoring. Sludge reporting shall include:

1. The results of sludge monitoring specified on page 5.
2. The amount of sludge generated that year, in dry metric tons, and the amount accumulated from previous years.
3. Demonstrations of pathogen reduction methods and vector attraction reduction methods, as required in 40 CFR, Parts 503.17 and 503.27, and certifications.
4. A description of disposal methods, including the following information related to the disposal methods used at the WWTF. If more than one method is used, include the percentage of sludge production disposed of by each method.
 - a. For landfill disposal, include: the name and location of the landfill receiving the sludge, and the Order number of WDRs that regulate it.
 - b. For land application, include: the location of the site, and the Order number of any WDRs that regulate it.
 - c. For incineration, include: the name and location of the site where sludge incineration occurs, the Order number of WDRs that regulate the site, the disposal method of ash, and the name and location of the facility receiving ash (if applicable).
 - d. For composting, include: the location of the site, and the Order number of any WDRs that regulate it.

The Discharger shall implement the above monitoring program on the first day of the month following adoption of this Order.

Ordered by: Pamela Creedon
PAMELA C. CREEDON, Executive Officer

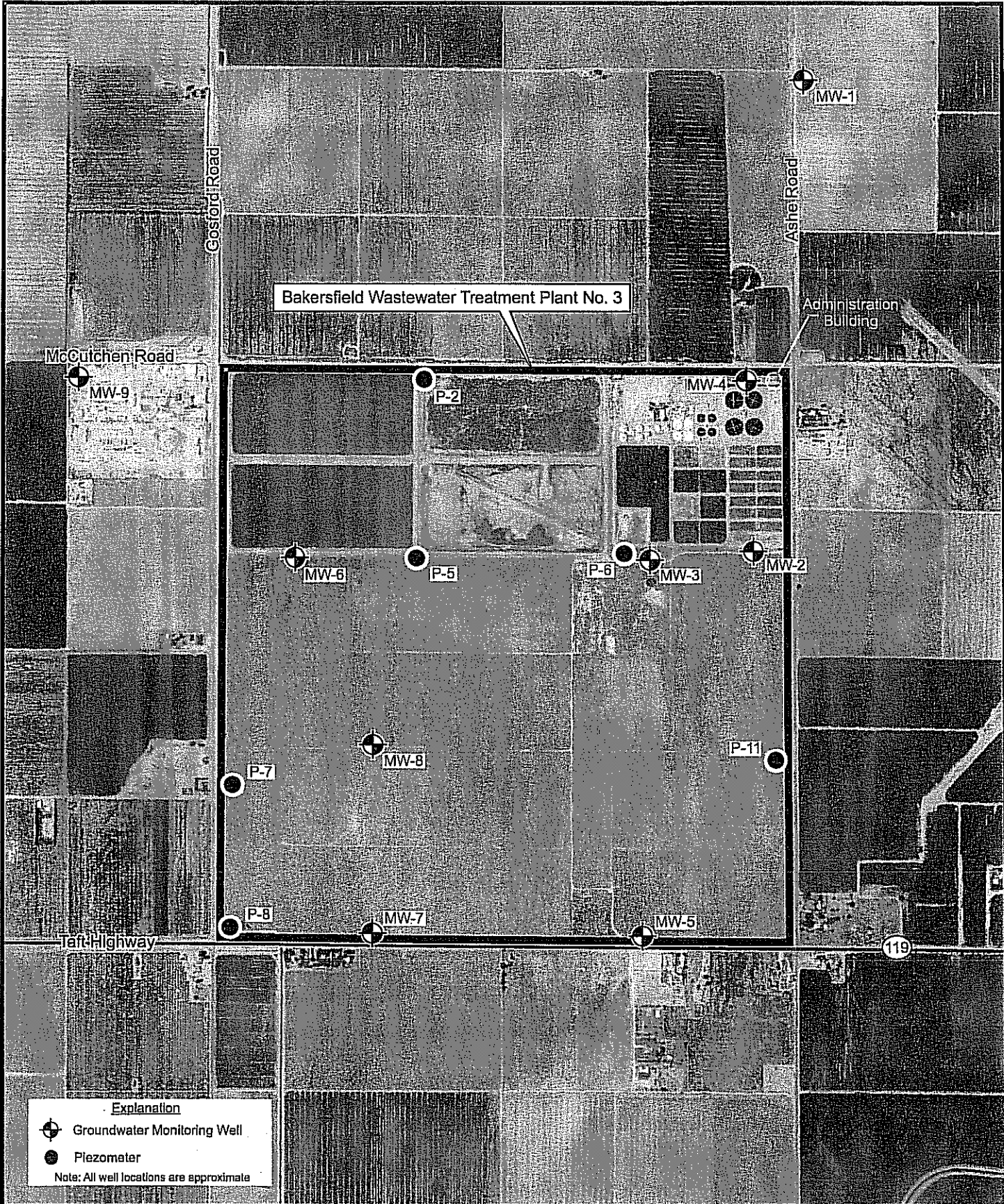
August 13, 2009
(Date)

Table 1. Priority Pollutant Scan

<u>Inorganics</u>¹	<u>Organics</u>		
Antimony	Acrolein	3-Methyl-4-Chlorophenol	Hexachlorobenzene
Arsenic	Acrylonitrile	Pentachlorophenol	Hexachlorobutadiene
Beryllium	Benzene	Phenol	Hexachlorocyclopentadiene
Cadmium	Bromoform	2,4,6-Trichlorophenol	Hexachloroethane
Chromium (III)	Carbon tetrachloride	Acenaphthene	Indeno(1,2,3-c,d)pyrene
Chromium (VI)	Chlorobenzene	Acenaphthylene	Isophorone
Copper	Chlorodibromomethane	Anthracene	Naphthalene
Lead	Chloroethane	Benzidine	Nitrobenzene
Mercury	2-Chloroethylvinyl Ether	Benzo(a)Anthracene	N-Nitrosodimethylamine
Nickel	Chloroform	Benzo(a)pyrene	N-Nitrosodi-n-Propylamine
Selenium	Dichlorobromomethane	Benzo(b)fluoranthene	N-Nitrosodiphenylamine
Silver	1,1-Dichloroethane	Benzo(g,h,i)perylene	Phenanthrene
Thallium	1,2-Dichloroethane	Benzo(k)fluoranthene	Pyrene
Zinc	1,1-Dichloroethylene	Bis(2-chloroethoxy) methane	1,2,4-Trichlorobenzene
Cyanide	1,2-Dichloropropane	Bis(2-chloroethyl) ether	
Asbestos	1,3-Dichloropropylene	Bis(2-chloroisopropyl) ether	<u>Pesticides</u>
	Ethylbenzene	Bis(2-Ethylhexyl)phthalate	Aldrin
<u>Dioxin Congeners</u>	Methyl Bromide	4-Bromophenyl phenyl ether	alpha-BHC
2,3,7,8-TCDD	Methyl Chloride	Butylbenzyl Phthalate	beta-BHC
1,2,3,7,8-PentaCDD	Methylene Chloride	2-Chloronaphthalene	gamma-BHC (Lindane)
1,2,3,4,7,8-HexaCDD	1,1,2,2-Tetrachloroethane	4-Chlorophenyl Phenyl Ether	delta-BHC
1,2,3,6,7,8-HexaCDD	Tetrachloroethylene (PCE)	Chrysene	Chlordane
1,2,3,7,8,9-HexaCDD	Toluene	Dibenzo(a,h)Anthracene	4,4'-DDT
1,2,3,4,6,7,8-HeptaCDD	1,2-Trans-Dichloroethylene	1,2-Dichlorobenzene	4,4'-DDE
OctaCDD	1,1,1-Trichloroethane	1,3-Dichlorobenzene	4,4'-DDD
2,3,7,8-TetraCDF	1,1,2-Trichloroethane	1,4-Dichlorobenzene	Dieldrin
1,2,3,7,8-PentaCDF	Trichloroethylene (TCE)	3,3'-Dichlorobenzidine	alpha-Endosulfan
2,3,4,7,8-PentaCDF	Vinyl chloride	Diethyl phthalate	beta-Endosulfan
1,2,3,4,7,8-HexaCDF	2-Chlorophenol	Dimethyl phthalate	Endosulfan Sulfate
1,2,3,6,7,8-HexaCDF	2,4-Dichlorophenol	Di-n-Butyl Phthalate	Endrin
1,2,3,7,8,9-HexaCDF	2,4-Dimethylphenol	2,4-Dinitrotoluene	Endrin Aldehyde
2,3,4,6,7,8-HexaCDF	2-Methyl-4,6-Dinitrophenol	2,6-Dinitrotoluene	Heptachlor
1,2,3,4,6,7,8-HeptaCDF	2,4-Dinitrophenol	Di-n-Octyl Phthalate	Heptachlor epoxide
1,2,3,4,7,8,9-HeptaCDF	2-Nitrophenol	1,2-Diphenylhydrazine	Polychlorinated biphenyls
OctaCDF	4-Nitrophenol	Fluoranthene	Toxaphene
		Fluorene	

¹ With the exception of wastewater samples, samples placed in an acid-preserved bottle for metals analysis must first be filtered. If filtering in the field is not feasible, samples shall be collected in unpreserved containers and submitted to the laboratory within 24 hours with a request (on the chain of custody form) to immediately filter then preserve the sample.

² Samples to be analyzed for volatile compounds and phthalate esters shall be grab samples; the remainder shall be 24-hour composite samples.



Bakersfield Wastewater Treatment Plant No. 3

Administration Building

McCutchen Road



Cosford Road

Asher Road

Taft Highway

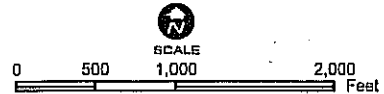
119

Explanation

-  Groundwater Monitoring Well
-  Piezometer

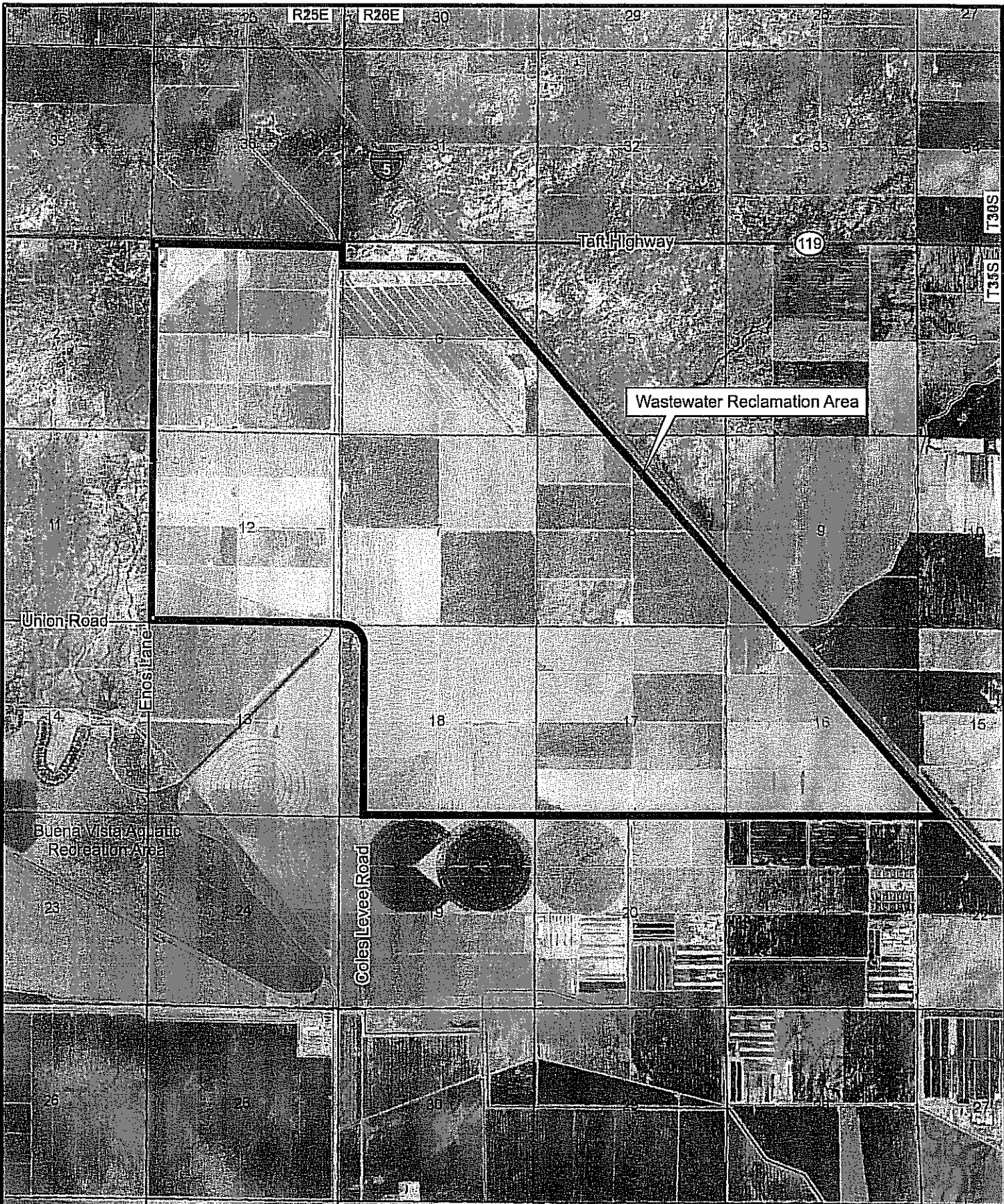
Note: All well locations are approximate

Map Source:
NAIP Aerial Photograph (2005)
Section 33, T30S, R27E, MDB&M

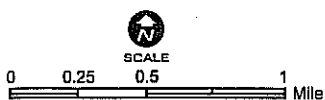


SITE MAP
ORDER NO. R5-2009-0087
WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF BAKERSFIELD
WASTEWATER TREATMENT PLANT NO. 3
KERN COUNTY

ATTACHMENT A



Map Source:
NAIP Aerial Photograph (2005)



INTERSTATE 5 RECLAMATION AREA

ORDER NO. R5-2009-0087

WASTE DISCHARGE REQUIREMENTS

FOR

CITY OF BAKERSFIELD

WASTEWATER TREATMENT PLANT NO. 3

KERN COUNTY

ATTACHMENT B



NONPOTABLE WATER INTERNATIONAL SYMBOL

ORDER NO. R5-2009-0087
WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF BAKERSFIELD
WASTEWATER TREATMENT PLANT NO. 3
KERN COUNTY

ATTACHMENT C

INFORMATION SHEET

ORDER NO. R5-2009-0087
CITY OF BAKERSFIELD
WASTEWATER TREATMENT PLANT NO. 3
KERN COUNTY

The City of Bakersfield (Discharger) is expanding Wastewater Treatment Plant No. 3 (WWTP No. 3), which serves the western portion of the incorporated Bakersfield metropolitan area (City) west of Highway 99 in Kern County. WWTP No. 3 is regulated by Waste Discharge Requirements Order 5-01-105 (WDR), which authorizes the discharge to land of up to 16 mgd of undisinfected secondary-treated effluent to four unlined effluent storage ponds and to nearby lands for recycling.

Background

When it opened in 1972, WWTP No. 3 was regulated by Waste Discharge Requirements (WDR) Order 72-92, which permitted a flow of 3.5 million gallons per day (mgd). Several WDRs have been issued since then, up to the current permitted flow of 16 mgd.

The existing wastewater treatment facility provides primary and secondary treatment of incoming wastewater, consisting of two bar screens, a wet well, two aerated grit chambers, four primary clarifiers, four trickling filter units, four secondary clarifiers, four effluent storage ponds (total capacity of about 1,000 acre-feet), six anaerobic digesters, an equalization lagoon, and about 20 acres of unlined sludge drying beds. Chemical addition of ferric chloride and polymers is conducted to enhance the primary settling process and increase the plant efficiency.

The Discharger is in the process of expanding/upgrading WWTP No. 3 and the project is anticipated to be completed by April 2010. Upon completion of the expansion project, WWTP No. 3 will have a Daily Dry Weather Average Flow of up to 32 mgd and a Peak Hourly Flow of 64 mgd.

Solids/Biosolids Disposal

Solids removed by the bar screens and materials collected from the grit chamber are disposed of at a sanitary landfill.

Sludge is pumped from the primary and secondary clarifiers and treated by anaerobic digestion prior to being transferred to onsite drying beds. The digested sludge is discharged to the drying beds for drying for at least 90 days. The drying beds have decant facilities, but no underdrains and they are unlined. After drying, the biosolids are stockpiled within the drying beds until removal for land application. The dried biosolids are transferred and applied to the City's WWTP No. 2 reclamation area, where they are used as soil amendment and fertilizer for non-human consumption crops. The existing 20 acres of sludge drying beds will be removed during the expansion and not replaced. After expansion, the Discharger will mechanically dewater the sludge and it will be transported to the biosolids reclamation area adjacent WWTP No. 2.

The Discharger's *Final Biosolids Management Plan* dated 26 September 1997 describes its management plan for biosolids applied to the reclamation area. The Discharger conducts

quarterly sampling of the biosolids and monitors the cumulative loading of metals in the biosolids applied pursuant to 40 CFR Part 503.

The Discharger prepares Annual Land Management reports that document the amount of and to what fields biosolids were applied. According to data presented in the 2007 Annual Land Management report, the Discharger applied 3,832 dry US tons of biosolids generated from both WWTP No. 2 and WWTP No. 3 in 2007. The reclamation area farmland is currently leased to the Progressive Associates Group to farm the acreage until 2015.

Groundwater Conditions

Historically, groundwater monitoring indicated that the discharge had caused exceedances of some groundwater limitations, particularly constituents of salinity (e.g., EC, chloride, and sodium) and nitrate. Much of this was from the discharge of yeast processing waste that has since been discontinued. Effluent was blended with industrial waste from the yeast plant from the early 1970s until 1984. Order 83-016 was issued to the yeast plant in 1983. From 1985 through 2002, yeast processing waste was discharged to 400 acres of City-owned land south of the facility. A salinity reduction plan was submitted in October 2001 and the discharge of the high strength waste ceased completely in 2002. The investigation and cleanup of impacts from the previous discharges, that also involve other parties, will be addressed by a separate Cleanup and Abatement Order.

Two groundwater zones exist beneath WWTP No. 3: a discontinuous perched zone and an unconfined aquifer. Historically, depths to perched groundwater have ranged from about 11 to 38 feet bgs.

The existing monitoring well network for the unconfined aquifer is comprised of nine groundwater-monitoring wells designated MW-1 through MW-9 (Attachment A). Depth to unconfined groundwater in 2007 and 2008 ranged from about 126 to 149 feet bgs. The direction of groundwater flow is somewhat variable due to mounding under the effluent storage ponds. Regional flow is to the east/southeast.

Based on the regional direction of flow, MW-9 appears to be directly upgradient of WWTP No. 3, while MW-1 appears to be cross-gradient. MW-4 is on the upgradient edge, but is likely affected by the WWTP due to mounding around the storage ponds. MW-2 and MW-3 are directly adjacent to and south of WWTP No. 3. MW-6 is adjacent to and south of the storage ponds. MW-8 is about a third of a mile south of MW-6 in the 400-acre area used previously for the disposal of municipal and industrial (yeast plant) wastewater. MW-5 and MW-7 monitor the southern extent of the WWTP No. 3 property and are about two thirds of a mile south of the treatment plant and storage ponds.

The following table summarizes averages of selected constituents from the monitoring wells since November 2002 (except MW-9, which was installed in 2005).

<u>SODIUM (mg/L)</u>							
	2002	2003	2004	2005	2006	2007	2008
<u>Well</u>							
				<u>Background Wells</u>			
MW-1	40	49	46	44	45	48	46
MW-4	40	48	48	52	56	58	59
MW-9	---	---	---	48	50	53	56
				<u>Downgradient Wells</u>			
MW-2	66	69	71	76	77	76	76
MW-3	72	74	78	84	76	75	80
MW-5	169	158	178	193	158	130	120
MW-6	85	83	87	108	101	95	---
MW-7	65	45	44	83	86	67	71
MW-8	142	133	105	96	88	85	---

<u>CHLORIDE (mg/L)</u>							
	2002	2003	2004	2005	2006	2007	2008
<u>Well</u>							
				<u>Background Wells</u>			
MW-1	30	30	39	52	64	68	65
MW-4	53	60	66	63	66	68	73
MW-9	---	---	---	31	43	46	49
				<u>Downgradient Wells</u>			
MW-2	74	81	79	76	76	76	77
MW-3	72	70	78	75	74	72	75
MW-5	266	258	302	275	210	155	155
MW-6	71	78	84	82	80	75	---
MW-7	196	98	101	177	170	113	118
MW-8	209	175	120	103	83	86	---

<u>ELECTRICAL CONDUCTIVITY (umhos/cm)</u>							
	2002	2003	2004	2005	2006	2007	2008
<u>Well</u>							
				<u>Background Wells</u>			
MW-1	689	700	731	810	880	858	867
MW-4	667	770	684	738	795	805	841
MW-9	---	---	---	639	703	698	732
				<u>Downgradient Wells</u>			
MW-2	895	943	777	843	848	833	857
MW-3	747	738	622	739	753	748	766
MW-5	2060	2000	2177	2028	1675	1325	1288
MW-6	823	765	681	907	930	855	---
MW-7	1410	813	621	1265	1275	883	974
MW-8	1580	1450	1127	899	825	808	---

Initially, MW-1 and MW-4 were intended to serve as upgradient monitoring wells, but increasing nitrate concentrations (possibly from upgradient turf farms) in those two wells led to the installation of MW-9 in 2005. Background water quality is currently represented by samples collected from MW-9. Comparing results from MW-9, effluent concentrations indicate the discharge will degrade groundwater quality beneath WWTP No. 3. Background

groundwater quality in MW-9 is about 700 umhos/cm, while effluent averages about 800 umhos/cm.

Inorganic concentrations in MW-5 are elevated when compared to the results for background well MW-9. Previous studies have determined that the cause was the discharge of effluent blended with industrial waste from a yeast plant, which occurred from the early 1970s until 1984. In 1985, the industrial user was issued separate WDRs and from 1985 through 2002, discharged industrial waste to 400 acres of City-owned land south and directly adjacent WWTP No. 3. These practices resulted in an impact to both soil and groundwater that is still observed in downgradient wells MW-5 and MW-7.

Groundwater monitoring shows EC levels in MW-5 as high as 2,500 micromhos per centimeter (umhos/cm), but which have since decreased to 1,200 umhos/cm. The decrease is likely the result of the improved effluent quality since 2002 and the elimination of the industrial discharge. MW-3 is downgradient and directly adjacent the southeast corner of the existing storage ponds and has had EC as high as 1,000 umhos/cm. However, current EC values in MW-3 are about 780 umhos/cm. The quality of water in MW-3 appears to best represent current conditions downgradient of WWTP No. 3 and the effluent storage ponds.

Inorganic concentrations in MW-7, while not as high as those in MW-5, are elevated when compared to background concentrations. Inorganic concentrations in MW-8 are currently similar to background concentrations reported for MW-9. However, when monitoring began in 2002 and 2003, inorganic concentrations in MW-8 were similar to those in MW-5. Concentrations in MW-8 are currently similar to ambient concentrations reported for MW-3.

Compliance History

Out of twenty four monitoring events between January 2007 and December 2008, the Discharger exceeded the following:

- Monthly average BOD limit of 40 mg/L twenty two times
- Monthly average CBOD limit of 35 mg/L nine times
- Monthly average TSS limit of 40 mg/L four times
- Calculated limit for EC (500 umhos/cm plus the EC of the source water) once
- Flow limit of 16 mgd twelve times

It is anticipated that the expansion of WWTP No. 3 will bring the effluent back into compliance with the effluent limits. The Discharger has indicated that the new activated sludge system and the upgraded secondary clarifiers will be online shortly, and an improvement in effluent quality is expected once the new units are online.

The Discharger typically submits complete monitoring reports in a timely manner. There were no late or incomplete reports submitted in 2007 or 2008.

The WWTP has been inspected four times since February 2000 and three Notices of Violation (NOV) were issued. A February 2000 inspection found improper disposal of solid waste. A follow up inspection in November 2000 found the improper disposal had ceased and that no

further action was warranted. An April 2004 NOV was prepared in response to a sewage overflow that occurred in November 2003. A 17 July 2008 NOV was issued for exceeding the CBOD, TSS, and flow limits. That NOV concluded the violations would be addressed by the expansion of WWTP No. 3 and no further action was requested.

Basin Plan, Beneficial Uses, and Regulatory Considerations

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 µmhos/cm as a measure of the maximum permissible addition of salt constituents through use.

Discharges to areas that may recharge good quality groundwaters shall not exceed an EC of 1,000 µmhos/cm, a chloride content of 175 mg/L, or boron content of 1.0 mg/L.

Antidegradation

State Water resources Control Board Resolution 68-16 requires the Regional Water Boards to maintain high quality waters of the State until it is demonstrated that any change in quality will be consistent with the maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not result in water quality less than that described in State and Regional Water Board policies (e.g., quality that exceeds water quality objectives).

The current WDRs considered Resolution 68-16 and found that some degradation by typical waste constituents was in the best interest of the people of the State. The WDRs also included groundwater limitations in an effort to ensure the discharge did not result in water quality less than prescribed in the Basin Plan.

The groundwater limitations specified in WDRs Order 5-01-105 are the following, or background quality if, due to natural causes, background is greater:

Previous Groundwater Limitations

<u>Constituent</u>	<u>GW Limitation (mg/L, except EC and THMs)</u>
Boron	0.7
Chloride	106
Iron	0.3
Manganese	0.05
Sodium	69
EC (umhos/cm)	900
Total Coliform	ND
TDS	500
Total N	10

<u>Constituent</u>	<u>GW Limitation (mg/L, except EC and THMs)</u>
Nitrite	1
Nitrate	10
Ammonia	0.5
THMs (ug/L)	100

Recent values in MW-3, which is directly downgradient of the treatment facility and appears to best represent current conditions, indicate that, with the exception of sodium, the current discharge is resulting in groundwater beneath the facility meeting the existing groundwater limitations.

For sodium, the current WDRs set the groundwater limitation at 69 mg/L, which is based on protection of sprinkler-irrigated, salt-sensitive crops. However, review of various reports (USDA, *Soil Survey of Kern County: Northwestern Part*; Ayers and Westcott, *Water Quality for Agriculture*; Asano, *Wastewater Reclamation and Reuse*) and land use maps showing crops grown in the region, indicates soils in the area are not conducive to growing salt-sensitive crops and that salt sensitive crops are not grown in the area around the facility.

The predominant soil in the vicinity of the treatment facility is the Cajon sandy loam, which is described as a Class IIIs-4 soil. Class III soils are soils with severe limitations that reduce the choice of plants or require special conservation practices. The 's' designates the soil as shallow, droughty, or stony, and the '4' indicates it has a low water capacity in sandy areas. The Cajon sandy loam is reportedly suitable for growing crops such as alfalfa, cotton, and sugar beets.

The area also contains the Kimberlina fine sandy loam, which is described as a Class IIIs-6 soil and is saline/alkaline. Class II soils have moderate limitations and are reportedly suitable for salt tolerant crops such as cotton, alfalfa, and barley.

Ayers and Westcott indicate sodium concentrations up to 70 mg/L have no restrictions for salt-sensitive crops and concentrations from 70 to 210 mg/L have only slight to moderate restrictions. Asano provides numerical guidelines for irrigation of salt-sensitive crops and reports that sodium concentrations less than 100 mg/L have slight to no restrictions for irrigation of salt-sensitive crops.

Based on the information above, a numerical sodium limit is not necessary because sodium concentrations in groundwater will not restrict its use for agricultural or drinking water and accordingly will not unreasonably affect present and anticipated beneficial uses or result in groundwater quality exceeding water quality objectives.

The Order establishes new groundwater limits for WWTP No. 3 that are performance based and 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. The

Order contains requirements for a groundwater assessment for assuring that the highest water quality consistent with the maximum benefit to the people of the State will be achieved.

Generally, although the Discharger is proposing an increase in flow, the quality of effluent will improve after the WWTP expansion. Therefore, degradation of groundwater should actually be less than authorized under the current WDRs and the future discharge will have less impact on water quality than the previously permitted discharge. Expansion of the WWTP will reduce nitrate as nitrogen concentrations in the effluent to less than the Primary MCL of 10 mg/L. The EC of the discharge will be less than the lowest recommended Secondary MCL of 900 μ mhos/cm. Although greater than the groundwater limit in the previous WDRs, sodium concentrations average about 80 mg/L, which does not restrict usage for the area's agriculture or as a drinking water source. Overall, degradation of groundwater should actually be less than authorized under the current WDRs.

The proposed WDRs do not include specific limits for all of the constituents in the current WDRs since:

- a. Most of the constituents have MCLs, which are specified by the Basin Plan and included under Groundwater Limitations, G.1.a of Order R5-2009-0087;
- b. Some of the limits were duplicative (e.g., EC and TDS);
- c. Groundwater Limitation G.1.b will provide a mechanism to ensure that constituents without an MCL do not threaten to unreasonably degrade groundwater; and
- d. To prevent too many false positive violations, the list of regulatory limits should be limited to the best indicators of a groundwater problem that would be caused by the discharge.

However, groundwater will continue to be monitored for all the constituents for which limits are being dropped.

In summary, the future discharge will have less impact on water quality than the previously permitted discharge. Expansion of the WWTP will reduce nitrate as nitrogen concentrations in the effluent to less than the Primary MCL of 10 mg/L. The EC of the discharge will be less than the lowest recommended Secondary MCL of 900 μ mhos/cm. Although greater than the groundwater limit in the previous WDRs, sodium concentrations average about 80 mg/L, which does not restrict usage for the area's agriculture or as a drinking water source. Additionally, the Order contains requirements for a groundwater assessment for assuring that the highest water quality consistent with the maximum benefit to the people of the State will be achieved.

This Order establishes new groundwater limits for WWTP No. 3 that are performance based and 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

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(a) exempts discharges of domestic sewage to land from Title 27 containment standards provided the Regional 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.

Discharges of domestic sewage and effluent can be treated and controlled to a degree that will not result in unreasonable degradation of groundwater. For this reason, the Discharger has been conditionally exempted from Title 27. Treatment and storage facilities for sludge that are part of the WWTF are considered exempt from Title 27 under section 20090(a), provided that the facilities not result in a violation of any water quality objective. However, residual sludge (for the purposes of the proposed Order, sludge that will not be subjected to further treatment by the WWTF) is not exempt from Title 27. Solid waste (e.g., grit and screenings) that results from treatment of domestic sewage and industrial waste also is not exempt from Title 27. This residual sludge and solid waste are subject to the provisions of Title 27.

Accordingly, the municipal discharge of effluent and the operation of treatment or storage facilities associated with a municipal wastewater treatment plant can be allowed without requiring compliance with Title 27, but only if the resulting degradation of groundwater is in accordance with the Basin Plan.

CEQA

The Discharger prepared an Initial Study/Environmental Checklist for the proposed expansion to 32 mgd in March 2006 that concluded an EIR was required. The Discharger prepared and circulated a draft EIR in October 2006 and certified it on 10 January 2007.

The EIR identified significant and potentially significant threats to hydrology and water quality, and included mitigation measures to alleviate the anticipated threats. Staff has reviewed the EIR and concurs with the findings and mitigation measures therein.

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.

The proposed Order would keep the flow limit to 16 mgd until the expansion activities are complete and the Discharger is compliant with the effluent limits.

The proposed Order would carry over the previous Order's effluent limits for CBOD of 35 mg/L (monthly average), and 70 mg/L (daily maximum) and for BOD and TSS of 40 mg/L (monthly average), and 80 mg/L (daily maximum) until 1 September 2009. After 1 September 2009, the effluent limits will include BOD and TSS limits of 40 mg/L (monthly average), and 80 mg/L (daily maximum). These limitations are based on Basin Plan minimum performance standards for municipal facilities.

The proposed Order includes an effluent limit for total nitrogen of 10 mg/L. The Discharger has requested that only effluent discharged to the storage ponds at the WWTF be subject to the 10 mg/L effluent limitation, and that effluent used for irrigation purposes at the I-5 Reclamation site and for landscaping purposes be allowed at a higher concentration. The Discharger reports that this will allow for considerable energy savings and will limit the amount of fertilizer applied to support the crops grown. Effluent Limit B. 5 sets a total nitrogen limit of 10 mg/L, but Provision H.12 allows for higher total nitrogen concentrations to irrigated areas, provided the Discharger demonstrates that total nitrogen concentrations greater than 10 mg/L will not contribute to the degradation of the underlying groundwater at the reclamation area.

The discharge requirements regarding dissolved oxygen and freeboard are consistent with Regional Water Board policy for the prevention of nuisance conditions, and are applied to all such facilities.

The proposed WDRs 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 exceedance of these objectives or natural background water quality, whichever is greatest.

Monitoring Requirements

Section 13267 of the CWC authorizes the Regional 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 an 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 influent, effluent, perched groundwater, unconfined groundwater, pond, and water supply monitoring. The monitoring is necessary to evaluate the extent of the potential degradation from the discharge.

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. The proposed Order would set limitations based on the information provided thus far. If applicable laws and regulations

change, or once new information is obtained that will change the overall discharge and its potential to impact groundwater, it may be appropriate to reopen the Order.

JSP/DKP 6/9/09