CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2004-0008

WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF ORANGE COVE
WASTEWATER TREATMENT FACILITY
FRESNO COUNTY

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

1. The City of Orange Cove (hereafter City or Discharger) submitted components of a Report of Waste Discharge (RWD), dated 11 February 2003, 12 May 2003, and 18 July 2003, for a modification and expansion (hereafter Expansion Project) of its wastewater treatment facility (WWTF). The WWTF provides municipal sewerage service for the City's 8,700 residents and currently has a design capacity of 0.9 million gallons per day (mgd). The WWTF is approximately one mile southwest of the City in Section 23, T15S, R24E, MDB&M, as shown on Attachment A, a part of this Order.

2. Waste Discharge Requirements (WDRs) Order No. 5-00-078, adopted on 28 April 2000, limits the average daily dry weather discharge to 1.0 mgd. The WDRs restrict the flow to 0.9 mgd until the City submits a technical report verifying that the WWTF can effectively treat and dispose of 1.0 mgd. The WDRs prescribe effluent limitations for 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS), settleable solids (SS), turbidity, total coliform organisms (TCO), and conductivity at 25°C (EC).

3. The purpose of this Order is to rescind Order No. 5-00-078 to prescribe requirements that are reflective of the Discharger's Expansion Project.

4. An estimated 70 percent of the WWTF's influent flow is from residential sources, the remainder from industrial and commercial sources. The major industrial contribution is from citrus packing houses (primarily oranges), which discharge up to 0.5 mgd during the winter packing season. The RWD characterizes the packinghouse wastewater as having, in general, moderate BOD_5 and TSS concentrations and high peak flows during seasonal operation and wash activities. The Discharger does not have pretreatment and monitoring programs for its industrial users. Industrial users are billed for sewerage services based on a percentage of their metered source water usage.

5. Most of the WWTF's collection system was constructed over 40 years ago. Its design grades proved to be too flat, resulting in inadequate flushing velocities. To date, the WWTF's collection system consists of 15.6 miles of 6-inch to 24-inch sewer lines. Operational problems include blockages in collection pipelines caused by grease and debris build-up. In April 2003, the City completed the construction of a new 18-inch main sewer trunk to 36-inch interceptor to serve new development within the City limits. The new trunk line will not be connected until the Expansion Project is complete. The City is planning to replace 7,000 linear feet of sewer pipeline in areas with insufficient line capacity.

6. The City has a separate storm water collection and disposal system that serves most of the City. Self-monitoring reports from 2002 indicate that winter flows are higher than summer flows, which

the City attributes to (1) winter packinghouse flows of up to 0.5 mgd, (2) significant inflow due to leakage through sewer manholes, and (3) illegal storm water connections. The collection system improvements described in Finding 5 will rectify some of the inflow problems.

7. *Existing WWTF.* The WWTF treatment system, as currently permitted, consists of headworks, five aeration ponds (series) with an overflow pond, a settling pond, a flocculation tank, micro-screens, two traveling bridge filters (parallel), a chlorination system, three spillage containment ponds (series), and four evaporation/percolation ponds (storage ponds 1 through 4). The overflow pond and spillage containment ponds are used for emergency purposes. Storage pond 2 receives filter backwash water. Attachments B and C, a part of this Order, depict a plan view and process flow diagram of the WWTF, respectively.

8. *Existing Use Area.* Up to 3.0 mgd of effluent from the storage ponds may be discharged via pipelines to the Orange Cove Irrigation District (hereafter District) for distribution in Improvement Districts 7 and 8. These districts are comprised of all or parts of Sections 14, 15, 22, 23, 24, 25 and 26 of T15S, R24E, MDB&M, and part of Section 19 of T15S, R25E, MDB&M, as shown in Attachment E, a part of this Order (District Use Area). The use of recycled water by the District is regulated by Wastewater Reclamation Requirements (WRRs) Order No. 89-064. Effluent is diluted with at least three parts irrigation water from the Friant-Kern Canal before it is used to irrigate various food crops. The District accepts and delivers recycled water between mid-April and mid-November. The District's distribution system is a closed underground system. According to the District, the City delivered 19, 142, 150, and 46 acre-feet during 1999, 2000, 2001, and 2002. The District has not received effluent from the City since 2002.

9. *Expansion Project.* One of the objectives of the Expansion Project is to simplify the treatment technology. The RWD describes the City's proposal to replace the current tertiary treatment with "advanced secondary treatment" of up to an annual average discharge flow of 2.3 mgd. The WWTF's existing aerated lagoons will be modified to an activated sludge process that will implement nitrogen removal. The expansion will also include new headworks, secondary clarifiers, sludge treatment, storage and handling facilities, necessary treatment improvements to the tertiary system, additional land for effluent recycling, and an additional effluent storage pond (hereafter storage pond 5). Attachment D, a part of this Order, depicts a flow diagram of the Expansion Project.

10. *City Use Area.* As part of the Expansion Project, the City will acquire, as funding allows, a total of 475 acres. The land will be purchased in three phases: phase 1 consisting of 50 acres; phase 2 consisting of 109 acres, 50 acres of which will be used to construct storage pond 5; and phase 3 consisting of 316 acres. Approximately 425 acres (City Use Area) will be irrigated with undisinfected secondary-treated recycled water to grow alfalfa. The City has already determined the areas that will be purchased, which are shown on Attachment A. The purchase of the 50-acre parcel described as phase 1 to the north of the WWTF property is currently pending (identified on Attachment A as phase 1 Use Area).

11. The existing WWTF that incorporates tertiary treatment and the Expansion Project that will incorporate an activated sludge process are and will be classified as a Class III WWTF according to the California Code of Regulations (CCR), Division 3, Chapter 26, §3675. Section 3680(a) specifies that each chief WWTF operator "shall possess a valid operator certificate of a grade at

least equivalent to the class of plant operated." Therefore, the WWTF requires a chief plant operator of Grade III or higher.

12. *Discharge Characterization.* In 2002, the monthly average dry weather and wet weather flows were 0.87, and 1.27 mgd, respectively. Self-monitoring data from the 2002 calendar year characterize the discharge as follows:

		Influent		Effluent	
Constituent	Units	Average[1]	Range[2]	Average	Range
Settleable Solids	mL/L	4.6	1.5 - 9.0	0.1	0.1 - 0.1
BOD_5[3]	mg/L	150	84 - 260	5	2 - 16
TSS[4]	mg/L	225	21 - 3290	22	4 - 51
EC[5]	µmhos/cm	--	--	480	320 - 591
Total Coliform Organisms	MPN[6] /100 ml	--	--	--	< 2 - >1600

1 The annual average
2 The range of values for year (not monthly averages)
3 5-day, 20°C biochemical oxygen demand
4 Total suspended solids
5 Conductivity at 25°C
6 Most Probable Number

13. As indicated in Finding 12, the WWTF is providing 95 percent BOD_5 reduction and 90 percent TSS reduction.

14. Cease and Desist Order No. 5-00-078 (CDO), adopted on 28 April 2000, directs the Discharger to achieve compliance with its WDRs, as well as upgrade the WWTF's headworks, collection system, and disposal and treatment systems. The City has periodically violated effluent limitations for BOD_5, TSS, turbidity, chlorine residual, and total coliform. Since the adoption of the CDO, Notices of Violations (NOV) were issued on 22 April 2002, 19 June 2002, and 23 February 2003, for various violations including: bypass of untreated or partially treated wastewater, spilling wastewater on adjacent properties not permitted to accept wastewater, exceeding various effluent limitations, and failing to retain a Grade III wastewater treatment operator. The Discharger has not completed all the Tasks required by the CDO due, in part, to funding constraints. An enforcement order to be considered separately requires the Discharger to complete the Expansion Project; including upgrading the tertiary treatment system to ensure an acceptable effluent quality is discharged to the District. The Discharger's compliance history is detailed in the Information Sheet and accompanying enforcement order.

15. *Spills.* Raw or partially treated wastewater was spilled on four separate occasions during 2002 and 2003 to olive orchards north of the WWTF property. The spills were due, in part, to deferred maintenance of the headworks and aerated pond berms and valves. The Discharger was issued

NOVs on 19 June 2002 and 25 February 2003 for these spills. Due to the quality of the spilled wastewater in 2002, the owner of the land was unable to harvest the olives from the trees in the spill area. In 2002, the Discharger paid the owner of land $6,400 for the cost of lost harvest. In 2003, the Discharger began the process of purchasing that land for future effluent disposal.

16. Due to problems with the tertiary-treatment portion of the WWTF and to hydraulic capacity issues, the City requested by letters dated 17 October 2000 and 29 May 2003 authorization to discharge secondary-treated wastewater to a vacant 40-acre City-owned parcel at the northeast corner of Monson Avenue and Parlier Avenue (shown on Attachment A as "Emergency Disposal Area"). Regional Board letter dated 25 October 2000 indicated that staff would not initiate enforcement for the unpermitted discharge provided the City conducted the discharge in compliance with all applicable water recycling regulations. The City indicates that the parcel will eventually be developed into a regional park. The discharge to this parcel is not covered under this Order.

17. The City obtains its source water from City wells and surface water. Source water is supplied primarily from the Friant-Kern Canal after appropriate treatment. The City's groundwater supply has been characterized in the past as containing high nitrate levels due to the application of fertilizers on local farmland (mostly citrus crops). When groundwater is used as a source, it is mixed with stored treated canal water. Over recent years, the City has reduced the amount of well water used to about 100 to 150 gallons per minute. Approximately once every three years, the City must increase the amount of groundwater used when the canal is cleaned. The RWD reports the following quality in 2001 for each water source:

Constituent / Parameter	Units	Canal Water Value	Groundwater Value
EC	:mhos/cm	86	525
Total Dissolved Solids (TDS)	mg/L	56	370
Sodium	mg/L	11.9	35
Chloride	mg/L	5.5	11
Nitrate **(as N)**	mg/L	0.1	9

18. Since 2002, the EC of effluent is, on average, about 400 µmhos/cm higher than source water EC. However, in 2001, the effluent was about 500 to 600 µmhos/cm higher than the previous year's source water EC. The Discharger does not consistently characterize source water EC. However, the Discharger reports that the increase in effluent EC could be due, in part, to the increase in well water use during that year and the inadequate calibration of EC meters used to monitor effluent.

19. The WWTF has approximately three-quarters of an acre of unlined sludge drying beds, which were abandoned in 1993. Since 1993, sludge has been allowed to accumulate in the aerated and storage ponds. The Discharger submitted a Sludge Management Plan, dated August 2003, that characterized the sludge in the existing aerated and disposal ponds and described sludge management in the Expansion Project. As part of the Expansion Project, the Discharger will remove sludge from aeration ponds 1 through 3, and will later remove sludge from aeration ponds 4 and 5 as funding allows. The Sludge Management Plan does not include a detailed description of how the Discharger

intends to remove, treat (e.g., dewatering methods, etc.), and ultimately dispose of the existing sludge accumulations (e.g., by permitted land application or landfill).

20. According to the RWD, the Expansion Project includes new sludge treatment, handling and storage facilities, including a 22,000-square-foot aerobic digester and 25,000 square feet of new sludge drying beds equipped with double liners, leak detection, and leachate collection systems.

21. The Discharger is not required to obtain coverage under a National Pollutant Discharge Elimination System general industrial storm water permit because all storm water runoff from the WWTF property is diverted into the storage ponds or aeration basins and does not discharge to a water of the United States.

Recycling

22. Domestic wastewater contains pathogens harmful to humans that are typically measured by means of total or fecal coliform, as indicator organisms. California Department of Health Services (DHS), which has primary State-wide responsibility for protecting public health, has established statewide criteria in Title 22, CCR, §60301 et seq., (hereafter Title 22) for the use of recycled water and has developed guidelines for specific uses.

23. The 1988 Memorandum of Agreement (MOA) between DHS and the State Water Resources Control Board (SWRCB or State Board) on the use of recycled water establishes basic principles relative to the agencies and the regional boards. 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.

24. Title 22 §60304 requires that recycled water used for irrigation of unrestricted crops be at least disinfected tertiary recycled water. Title 22 §60301.230 defines disinfected tertiary recycled water as adequately disinfected, oxidized, coagulated, clarified, and filtered. The effluent must meet the following effluent limitations: (a) the 7-sample median number of TCO in the disinfected effluent shall not exceed: a most probable number (MPN) of 2.2 per 100 ml and the maximum number of TCO shall not exceed an MPN of 23 per 100 ml in more than one sample within a 30-day period. No single sample shall exceed an MPN of 240 TCO per 100 ml; (b) the chlorine contact time (CT) shall be at least 90 minutes during maximum flow. The CT (the product of chlorine contact time, in minutes, and the total chlorine residual concentration, in mg/l) shall be at least 450; and (c) filtered wastewater shall not exceed: a daily average of 2 nephelometric turbidity units (NTU), 5 NTU more than five percent of the time during any 24-hour period, and 10 NTU at any time.

25. Title 22 §60304 requires that recycled water used for the surface irrigation of fodder crops (e.g., alfalfa) be at least undisinfected secondary recycled water. Title 22 §60301.900 defines secondary recycled water as "oxidized water," which, according to Title 22 §60301.650, is defined as "wastewater in which the organic matter has been stabilized, is nonputrescible, and contains dissolved oxygen."

26. The WWTF will produce two qualities of effluent: (1) undisinfected secondary recycled water for discharge to the City Use Area described in Finding 10 and (2) disinfected tertiary for discharge to the District Use Area described in Finding 8, until the City has acquired all of the land necessary to dispose of the entire discharge flow.

27. The City submitted a Report of Water Recycling for the City Use Area pursuant to §13522.5 of the California Water Code (CWC) in support of recycling WWTF effluent. Title 22 §60323 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 to DHS pursuant to Title 22 for the City Use Area. By letter dated 5 August 2003, DHS relayed concerns regarding the quality and distribution of the effluent to the District Use Area. These include, in part, the Discharger's failure to include information in the Title 22 Engineering Report regarding (1) the District's management practices, specifically the separation requirements for domestic water supply wells; (2) the District's control measures to ensure the drift as a result of sprinkler irrigation does not occur off the use area; and (3) how the Discharger will ensure adequately treated wastewater will be delivered to the District. The Discharger is in the process of responding to these concerns.

28. The annual nitrogen uptake of alfalfa, the proposed City Use Area crop, is 480 pounds per acre year, according to the *Western Fertilizer Handbook*.

29. According to the RWD, effluent from the advanced secondary-treatment WWTF featured in the Expansion Project will contain, on average, a total nitrogen concentration of 10 mg/L or less.

30. The nitrogen loading rates from effluent during each phase of the Expansion Project is less than agronomic demand as indicated in the table below.

Phase	Monthly Average Dry Weather Flow (mgd)	City Use Area (acres)	Discharge to City Use Area (mg/year)	Nitrogen Loading Rate (lbs/acre/year)
1	1.1	50	65	109
2	1.4	109	144	111
3	2.0	425	554	109

Hydrology, Soils, and Land Use

31. The WWTF and Use Areas lie within the Tulare Lake Basin, specifically the Orange Cove Hydrologic Area (No. 551.50) of the South Valley Floor, as depicted on interagency hydrologic maps prepared by the California Department of Water Resources (DWR) in spring 1986. Surface water drainage is to the Kings River. All storm water runoff within the WWTF property is contained onsite.

32. Portions of the City Use Area, storage ponds and WWTF are within a 100-year floodplain, according to Federal Emergency Management Agency maps. The City reports in a 18 June 2002 mitigated negative declaration that portions of the City Use Area that are within the floodplain will not receive wastewater during the times when precipitation is likely and flooding occurs. In regards to the

Expansion Project, the City reports that it will increase the total elevation during the construction of the aeration basins and clarifiers by about four feet and will have adequate earthen berms surrounding the new storage pond to prevent the mixing of effluent with floodwaters.

33. The discharge area 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 evapotranspiration in the discharge area are 19 inches and 64 inches, respectively, according to information published by DWR.

34. Areal soils consist of mainly of San Joaquin Sandy Loam, with some Greenfield Sandy Loam, Concrete Sandy Loam, Romona and Atwater Sandy Loam. The City Use Area consists primarily of San Joaquin and Romona soils, which exhibit slow to very slow permeability rates. Overall, the permeability of the onsite soils of the WWTF and City Use Area is considered moderate. According to the RWD, the predominate soils in the WWTF vicinity exhibit permeabilities of around 1.2 inches/day (36.5 feet/year or 32,600 gallons/acre/day).

35. Regional groundwater is approximately 10 feet to 80 feet below ground surface (bgs) and flows southwesterly, according to information in *Lines of Equal Elevation of Water in Wells in Unconfined Aquifer*, published by DWR. In the discharge vicinity, subsurface materials are fine grained except for a sand layer approximately 39 feet below ground surface (bgs) and groundwater occurs typically between 20 and 40 feet bgs. According to the boring logs obtained during the installation of the City's groundwater monitoring wells (described in Finding 37), the top 12-17 feet of the soil is composed of clay, silty, or clay-slit mixture. Between approximately 17 feet and the top of the sand layer, the subsurface material consisted mainly of sand and silt mixture with scattered sand layers. The groundwater gradient in the WWTF vicinity is generally west-northwest according to groundwater elevation data collected by the City and others.

36. At full build-out, the WWTF will be rated 2.3 mgd or 2,600 acre-feet/year (af/yr). Annual evaporation losses from the WWTF's 110 acres of storage ponds amount to about 585 af/yr (22 percent). The RWD's water balances assume the permeability of soils underlying storage ponds is 0.12 inch/day (4 feet/year or 3,260 gallons/acre/day), resulting in percolation losses of only 440 feet/year (17 percent). The assumed permeability is 10 percent of that exhibited by the predominant soils in the area. Using a conservative, worst-case scenario of disposal capacity by percolation ensures the WWTF has adequate capacity during a 100-year rainfall year when operating at maximum design capacity. However, this approach most likely underestimates actual percolation losses and, by extension, the discharge's relative contribution to area groundwater.

37. The Discharger's groundwater monitoring well network is shown in Attachments A and B. The network was constructed in February 2002 and consists of five wells: two upgradient (MW-1 and MW-2) and three downgradient (MW-3, MW-4, and MW-5). Downgradient wells are adjacent to or directly downgradient of storage and treatment ponds. The Discharger has been monitoring groundwater quality since June 2002 quarterly for nitrate, ammonia, total Kjeldahl nitrogen, chloride, EC, general minerals, and TCO. A summary of the water quality data for selected constituents from these wells follows:

		Monitoring Wells		
		Upgradient		Downgradient
Constituent	Units	MW-1	MW-2	MW-3 - MW-5
NO_3-N	mg/L	14.6 – 26.2	< 0.2 - 0.5	< 0.1 - 3.0
EC	µmhos/cm	840 – 946	402 - 513	817 - 1,410
TDS	mg/L	537 – 600	294 - 306	533 - 883
Chloride	mg/L	94 – 124	16 - 69	99 - 168
Sodium	mg/L	40 – 45	29 - 42	98 - 178
Iron	mg/L	< 0.05 – 0.17	< 0.05 - 0.25	< 0.05 – 0.25
Manganese	mg/L	< 0.05 – 0.01	0.035 - 0.19	0.17 – 1.59

38. Upgradient well MW-1 is impacted by nitrate and other sources of waste constituents from area agricultural and residential land uses. Upgradient MW-2, adjacent to storage pond 4, is likely influenced by percolating effluent. At least one additional monitoring well at a more appropriate locations is necessary to better characterize regional groundwater uninfluenced by the discharge or other concentrated sources of waste constituents.

39. Data summarized in Finding 37 show monitoring wells downgradient of storage and aerated ponds contain elevated concentration of TDS, iron, and manganese. As described in Finding 62, increases in groundwater of these constituents are likely the result of organic overloading due to the long-term percolation of WWTF effluent in unlined ponds containing years' of sludge accumulation.

40. Land use in the WWTF vicinity is primarily agricultural and rural residential. Crops grown within five miles of the WWTF include cotton, alfalfa, corn (forage), citrus, olives, peaches, pomegranate, vineyards, and plums, according to 1994 DWR land use data. The District indicates that most crops in this area are sprinkler, flood or drip irrigated. As shown on Attachment A, the WWTF bounded on the west by the Alta Canal, a concrete-lined canal owned and managed by the Alta Irrigation District; on the east, a brine pond owned by the Bell-Carter Olive Company (hereafter Bell-Carter). The brine pond, constructed in 1977, impounds brine water generated by olive processing, covers about one acre, and is approximately nine feet deep. The pond's liner, a 20-mil polyvinyl chloride (PVC), is equipped with a percolation monitoring/leak detection system. While Bell-Carter has not reported detecting leaks during the life of the pond, a June 1990 pond closure investigation prepared by Carollo Engineers concludes pond leakage has occurred and degraded groundwater with sodium and chloride. Bell-Carter is developing a pond closure plan. This degradation complicates the interpretation of data obtained from City's wells downgradient of the brine pond.

41. In the process of crop irrigation, evaporation and crop transpiration remove water from soils and result in accumulation of residual salts in the soil root zone. These salts would retard or inhibit plant growth except for a fraction of irrigation water applied to leach the harmful salt from the root zone. Leached salts eventually enter ground water and concentrate above the uppermost layer of the uppermost aquifer. Leaching factors vary according to the quality of irrigation water, but leaching is necessary in all cases to sustain irrigated agriculture. As this is the general condition throughout the valley floor, water supply wells for all beneficial uses typically are constructed to extract

groundwater from below the uppermost layer. This uppermost layer has hydraulic continuity with the remainder of the aquifer.

42. The percolation from irrigated agriculture, with its relatively low and seasonal hydraulic loading rates, is generally dispersed near the groundwater surface. This discharge has been occurring for years and has caused groundwater to contain concentrations of waste constituents in excess of natural background levels, which can be characterized with adequate monitoring. While the assumed percolation rate of WWTF storage ponds is comparable to normal irrigation applications (e.g., 4 feet/year), the actual rate may be significantly higher. Accordingly, by virtue of loading, volume, and duration, the discharge has far greater horizontal and vertical impact in the immediate area than a comparable area of cropland. The extent to which percolating effluent descends into the main mass of the aquifer can be estimated by applying hydrogeologic judgment and is determinable through groundwater monitoring of conservative constituents in the discharge such as chloride.

Beneficial Uses and Water Quality Objectives

43. The Water Quality Control Plan for the Tulare Lake Basin, Second Edition, Basin (hereafter Basin Plan) designates beneficial uses, establishes narrative and numerical water quality objectives, and contains implementation plans and policies for protecting all waters of the Basin. The Basin Plan includes plans and policies of the SWRCB incorporated by reference. Pursuant to §13263(a) of the CWC, waste discharge requirements must implement the Basin Plan.

44. Water in the Tulare Lake Basin is in short supply, requiring importation of surface waters 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 an existing use or proposed use of fresh water with recycled water.

45. The Basin Plan requires WWTFs that discharge to land comply with treatment performance standards for BOD_5 and TSS. WWTFs that preclude public access and discharge 1 mgd or more must provide removal of 80 percent or reduction to 40 mg/L, whichever is more restrictive, of both BOD_5 and TSS.

46. The beneficial uses of Kings River designated by the Basin Plan are municipal and domestic supply; agricultural supply; industrial service supply; industrial process supply; water contact recreation; noncontact water recreation; warm freshwater habitat; wildlife habitat; and groundwater recharge.

47. The WWTF is in Detailed Analysis Unit (DAU) No. 240 of the Kings Basin. The Basin Plan designates the beneficial uses of groundwater in this DAU as municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.

48. Basin Plan water quality objectives to protect the above beneficial uses include a numerical objective for coliform and narrative objectives for chemical constituents in and toxicity of groundwater. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, or animals. The chemical constituent objective states groundwater shall not contain chemical constituents in concentrations

that adversely affect any beneficial use. The Basin Plan establishes numerical water quality objectives that quantify maximum permissible concentrations for groundwaters designated as municipal supply. These include maximum contaminant levels (MCLs) in Title 22, CCR (i.e., §64431 (Inorganic Chemicals); §64431 (Fluoride); §64443 (Radioactivity); §64444 (Organic Chemicals); and §64449 (Secondary MCLs - Consumer Acceptance Limits)).

49. As knowledge about concentrations harmful to public health is always expanding, the Basin Plan's incorporation of MCLs by reference is prospective to incorporate changes to MCLs as changes in Title 22 take effect. However, in event of such a change, its implementation would be affected through reopening of this Order and reconsideration of discharge requirements. The Basin Plan requires the application of objectives more stringent than MCLs as necessary to ensure that waters do not contain chemical constituents, toxic substances, radionuclides, or pesticides in concentrations that adversely affect domestic drinking water supply, agricultural supply, or some other beneficial use.

50. Quantifying a narrative water quality objective requires a site-specific evaluation of each waste constituent for consistency with the narrative objective using the translation procedures set forth in the Basin Plan. These procedures require the consideration of, among other things, site-specific hydrogeologic and land use factors and relevant numerical criteria and guidelines developed or published by other agencies and organizations. The latter include the National Academy of Sciences, the University of California Cooperative Extension, and the Food and Agricultural Organization of the United Nations. Westcot and Ayers in a 1985 publication *(Water Quality for Agriculture, Food and Agriculture Organization of the United Nations — Irrigation and Drainage Paper No. 29)* provide detailed information to evaluate the quality of irrigation water necessary to sustain various crops. This publication is clear that considerable judgment should be used in applying the criteria and that appropriate irrigation management and crop variety selection can overcome some of the adverse impact where high water quality is not an option.

51. The list of crops in Finding 40 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. Based on climate, soil type, and natural background water quality, other crops sensitive to salt and boron might be capable of being grown in the area, and changing market conditions could drive a change in cropping patterns, but for purposes of this Order neither is expected to necessitate greater protection than crops already identified.

52. The major constituents of concern in assessing the quality of water for agriculture are salinity (expressed as EC or TDS), boron, chloride, and sodium. In general, animal uses are less sensitive than crops for these constituents. Salinity reduces crop growth by reducing the ability of plant roots to absorb water. The salt tolerance of crops also depends on the frequency and type of irrigation (e.g., drip, furrow, or sprinkler irrigation). Sprinkler irrigation has the greatest impact due to foliar absorption of salt. Absorption and foliar injury are further influenced by high temperature, low humidity, and drying winds, type of sprinkler, and timing of irrigation. Boron is an essential element but can become toxic to some plants when concentrations in water even slightly exceed the amount required for optimal growth. Like salt tolerance, boron tolerance varies with the climate, the soil, and the crop. While boron sensitivity appears to affect a wide variety of crops, sodium and chloride toxicities are mostly limited to tree crops and woody perennials (e.g., citrus, stone-fruit, and vineyard). A predominance of sodium relative to other ions in irrigation

water may disperse soil aggregates, which in turn, affects virtually all crops by decreasing the permeability of the soil by water and air.

53. *Water Quality for Agriculture* provides general salt tolerance guidelines for many common field, vegetable, forage, and tree crops. Yield reductions in nearly all crops are not evident when irrigating with water having an EC of less than 700 µmhos/cm. There is, however, an eight- to ten-fold range in salt tolerance of agricultural crops. It is possible to achieve full yield potential with waters having EC up to 3,000 µmhos/cm if the proper leaching fraction is provided to maintain soil salinity within the tolerance of the crop.

54. In determining the concentrations of salinity, boron, chloride, and sodium in groundwater associated with no adverse affects on agricultural beneficial use in a given area, it is likely that multiple criteria apply. While the most stringent concentration becomes the constraining criterion, it is not necessarily the concentration that is required to protect all crops typically grown in the area.

55. With respect to specific-ion toxicity, *Water Quality for Agriculture* and other similar references indicate that significant reductions in crop yields can be expected if boron content exceeds 0.7 mg/L for boron-sensitive crops (e.g., stone fruit). Similarly, reductions in yields of sodium- and chloride-sensitive crops are not evident when sprinkler irrigated with water containing sodium and chloride concentrations of up to 3 milliequivalents per liter (meq/L) (i.e., 69 mg/L sodium and 106 mg/L chloride). If such crops are not sprinkler irrigated, the maximum concentrations of sodium and chloride associated with no apparent yield reduction may increase, however the extent of the increase is typically crop specific.

56. In the process of crop irrigation, evaporation and crop transpiration remove water from and result in accumulation of residual salts in the soil root zone. These salts would retard or inhibit plant growth except for a fraction of irrigation water applied to leach the harmful salt from the root zone. The leached salts eventually enter ground water and concentrate above the uppermost layer of the uppermost aquifer. As this is the general condition throughout the agricultural Tulare Lake Basin, water supply wells for all beneficial uses typically are constructed to extract groundwater from below this level.

57. Infiltration from effluent storage ponds results in wastewater intersecting and accumulating on and in the uppermost layer of the uppermost groundwater until dispersed horizontally and vertically into the main mass of the aquifer. Compliance with groundwater limitations (e.g., nitrogen compounds, bacteria, disinfection and decomposition by-products) has been and should continue to be, at a minimum, by means of wells extracting water from first encountered groundwater. Deeper monitoring wells may provide data to assess the extent to which, if any, decomposition byproducts (e.g., manganese) resulting from the residual carbon released by the discharge to uppermost groundwater threaten to cause exceedances of water quality limitations deeper in the aquifer.

58. The use of municipal wastewater for irrigation at agronomic rates will have a comparable impact on groundwater as fresh water extracted and used for irrigation of the same crop with separate wastewater infiltration. Beneficial reuse of wastewater conserves freshwater resources and is encouraged by the Basin Plan and agronomic application rates of wastewater cause comparable impact as widespread freshwater irrigation practices. Accordingly, benefits of groundwater

monitoring in wastewater reuse areas do not justify the cost, provided the rates of wastewater applications do not exceed reasonable agronomic rates.

Degradation and Groundwater Limitations

59. State Board Resolution No. 68-16 (hereafter Resolution 68-16 or the "Antidegradation" Policy) requires that discharge of waste maintain high quality waters of the State until it is demonstrated that any change in quality is consistent with 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 water quality policies (i.e., the change results in exceedances of water quality objectives).

60. Domestic wastewater contains constituents such as oxygen demanding substances (i.e., BOD_5), salinity constituents, pathogens, nutrients (e.g., nitrate), organics, and metals. Discharge to land in a manner that allows waste infiltration and percolation may result in an increase in the concentration of one or more of these constituents in groundwater. To be permissible, any increase in the concentration of these constituents in groundwater must be consistent with the antidegradation provisions of Resolution 68-16.

61. The discharge authorized herein and the treatment and storage facilities associated with the discharge of treated municipal wastewater, except for discharges of residual sludge and solid waste, are exempt from the requirements of Title 27, CCR, §20005 et seq. (hereafter Title 27). The exemption, pursuant to §20090(a) of Title 27, is based on the following:

    a. The waste consists primarily of domestic sewage and treated effluent;

    b. The waste discharge requirements are consistent with water quality objectives; and

    c. The treatment and storage facilities described herein are associated with a municipal wastewater treatment facility.

62. Excessive residual organic carbon in percolating effluent may result in prolonged periods of oxygen deficiency in groundwater. If effluent percolating to and mixing with groundwater contains more organic carbon than can be oxidized by microorganisms respiring on the residual oxygen in the effluent and available in the soil column, the soil and groundwater beneath effluent storage ponds will likely become anoxic. Further microbial decomposition of organic carbon in groundwater causes nitrate and oxidized forms of manganese and iron to substitute for oxygen as a terminal electron acceptor, reducing nitrate to nitrogen and transforming manganese and iron to more water-soluble reduced forms. Where groundwater underlying the WWTF (i.e., effluent storage ponds) contains dissolved manganese and iron in elevated concentrations, it likely indicates organic overloading (i.e., insufficient treatment to remove organics prior to percolation).

63. Degradation of groundwater by constituents (e.g., toxic chemicals) other than those specified in the groundwater limitations in this Order, and by constituents that can be effectively removed by conventional treatment (e.g., total coliform bacteria) is inconsistent with Resolution 68-16. Degradation of groundwater by waste constituents in the discharge after subjecting them to effective source control, treatment, and control may be determined consistent with Resolution 68-16, after

consideration of reasonableness under the circumstances of the discharge. Some degradation of groundwater by the Discharger is consistent with Resolution 68-16 provided that the degradation is

a. limited in extent;

b. restricted to waste constituents characteristic of municipal wastewater and not totally removable by best practicable treatment and control (BPTC) measures;

c. minimized by fully implementing, regularly maintaining, and optimally operating BPTC measures;

d. demonstrated to be consistent with water quality objectives prescribed in the Basin Plan; and

e. justified to be consistent with the maximum benefit to the people of California.

64. Degradation of groundwater by constituents in the discharge after effective source control, treatment, and control may be determined consistent with maximum benefit to the people of California. This determination is based on considerations of reasonableness under the circumstances of the municipal discharge. Factors to be considered include:

a. past, present, and probable beneficial uses of the water (as specified in the Basin Plan);

b. economic and social costs, tangible and intangible, of the discharge compared to the benefits;

c. environmental aspects of the discharge; and

d. implementation of feasible alternative treatment or control methods.

65. Groundwater passing under the WWTF contains elevated concentrations of salt constituents, manganese, and total coliform organisms compared to background water quality and to applicable water quality limitations.

66. The existing WWTF described in Finding 7 provides treatment and control of the discharge that incorporates:

a. technology for tertiary treatment of municipal wastewater;

b. disinfection;

c. an operation and maintenance manual;

d. wastewater reuse; and

e. groundwater monitoring.

67. Certain aspects of the WWTF described in Finding 7 does not reflect BPTC. Deficiencies in waste treatment and control include, but are not necessarily limited to:

a. failure to constituently meet the minimum performance standards for tertiary treatment set forth by WDRs Order No. 5-00-078;

b. failure to periodically remove accumulated sludge from unlined ponds;

c. bypass of treatment units (e.g., aerated ponds) without provision for assuring adequate treatment;

d. failure to adequately maintain WWTF equipment (e.g., flow monitoring devices, flocculation tank, filters, etc.) to maintain compliance with WDRs Order No. 5-00-078;

e. failure to maintain a capital recovery fund; and

f. failure to consistently retain the appropriate grade WWTF operator.

68. Many of the BPTC deficiencies will be at least partially remedied by the Expansion Project, described Finding 9, which incorporates:

a. technology for advanced secondary treatment of municipal wastewater, where "advanced" means the treatment includes nitrogen removal;

b. wastewater reuse;

c. sludge treatment and handling;

d. lining of sludge treatment and handling facilities;

e. lining of the treatment ponds;

f. an operation and maintenance manual; and

g. groundwater monitoring

69. Many of the projects included in the Expansion Project will provide additional water quality protection. Additionally, groundwater most influenced by percolating effluent in the storage ponds from the Expansion Project appears to meet most of the water quality limitations that are protective of agricultural and municipal uses. However, the City still needs to present sufficient site-specific information justifying the Expansion Project will fully implement BPTC. Deficiencies in treatment and control that cause or contribute to exceedances of Basin Plan numeric water quality objectives subject the Discharger to enforcement.

70. Provision H.14 establishes schedules of tasks to (1) evaluate BPTC for each major treatment, storage, and disposal component of the WWTF, (2) characterize groundwater for an expanded list of waste constituents specified in this Order's Monitoring and Reporting Program.

71. This Order represents the first of a two-phase approach to ensure a long-term discharge consistent with Regional Board plans and policies. It is appropriate that the Discharger assemble the technical

information necessary for the Regional Board to determine consistency with its plans and policies. During the schedule set forth herein as reasonable for Phase 1, the Discharger must:

a. Conduct a hydrogeologic investigation of the area affected by the discharge.

b. Perform a comprehensive evaluation of the WWTF and the discharge to:

1) identify less than optimum treatment or control practices, and

2) ensure full implementation of BPTC and provide optimal operation and maintenance.

c. Evaluate and propose, with supporting documentation, the appropriate level of degradation that complies with Resolution 68-16.

72. Following the completion of Phase 1 tasks, evidence submitted by the Discharger will be evaluated and this Order will be reopened to consider final terms of discharge consistent with Resolution 68-16. These include waste-specific groundwater limitations based on information provided by the Discharger that reflect full implementation of BPTC and compliance with the most stringent applicable water quality limitations for that waste constituent.

73. Until the work required in Phase 1 is completed by the Discharger and reviewed by the Regional Board, it is reasonable that interim receiving water limitations directly implement Basin Plan water quality objectives. These groundwater limitations 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. Where the stringency of the criterion for the same waste constituent differs according to beneficial use, the most stringent criterion applies as the governing limitation for that waste constituent. Consideration of the factors in CWC §13241, including economics, is unnecessary for this purpose. As interim groundwater limitations, the Phase 1 limitations are conditional, temporary, and convey no entitlement. Tasks assure that BPTC and the highest water quality consistent with the maximum benefit to the people of the State will be achieved at the end of the second phase. Accordingly, the discharge as authorized herein is consistent with the antidegradation provisions of Resolution 68-16.

CEQA

74. On 7 June 2002, the Discharger certified a mitigated negative declaration (MND) for the Expansion Project in accordance with the California Environmental Quality Act (CEQA), Public Resources Code §21000 et seq., and the State CEQA guidelines. The MND described a proposed WWTF expansion and flow increase to 3.0 mgd (average annual discharge flow of 2.3 mgd). Despite Regional Board staff comments identifying the Expansion Project's potential to adversely impact water quality, the MND does not provide sufficient information to identify, let alone, sufficiently mitigate all the project's significant impacts to water quality to less than significant levels. To illustrate, only two mitigation measures address water quality impacts from the project, namely, the City's commitment to (a) monitor groundwater in the WWTF vicinity and (b) retain a Grade III operator.

75. This Order implements measures necessary to mitigate the Expansion Project's adverse impacts to groundwater to less than significant levels, including:

    a. Discharge Specification B.1, which restricts flow to the WWTF to 0.9 mgd until the Discharger can certify it can treat and dispose of the proposed phased increase in discharge flow (up to a monthly average dry weather flow of 2.0 mgd) in accordance with the terms and conditions of this Order and the CWC.

    b. Discharge Specifications B.2 and B.3, which establish effluent limitations for BOD_5 and TSS according the specified treatment technology (i.e., tertiary and advanced secondary) and consistent with the Basin Plan's performances standards.

    c. Discharge Specification B.2, which establishes an effluent limitation for nitrogen of 10 mg/L to ensure percolating effluent does not contribute to exceedances of the water quality objective for nitrate.

    d. Discharge Specification B.15, which stipulates waste constituents cannot be released or discharged in a concentration or mass that causes violation of this Order's groundwater limitations.

    e. Recycling Specification D.5, which requires recycled water be applied at rates not exceeding reasonable agronomic demand.

    f. Sludge Specification E.3, which requires treatment and storage of sludge generated by the WWTF be confined to the WWTF property and conducted in a manner that precludes the infiltration of waste constituents into soils in a mass or concentration that will violate this Order's groundwater limitations.

General Findings

76. Pursuant to CWC §13263(g), discharge is a privilege, not a right, and adoption of this Order does not create a vested right to continue the discharge.

77. Section 13267 of the CWC states, in part, that:

> In conducting an investigation specified in [§13267] subdivision (a), the regional 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 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 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.

78. The technical reports required by this Order and the monitoring and reporting program required by this Order and the attached Monitoring and Reporting Program No. R5-2004-0008 are necessary to assure compliance with these waste discharge requirements. The Discharger operates the WWTF that discharges the waste subject to this Order.

79. 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.

80. DHS and the Fresno County Health Department were consulted, and their recommendations regarding public health aspects for the Discharger's water recycling operation were considered.

81. The Discharger and interested agencies and persons were notified of the intent to prescribe waste discharge requirements for this discharge and provided an opportunity to submit written views and recommendations and to be heard in a public meeting.

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

IT IS HEREBY ORDERED that Waste Discharge Requirements Order No. 5-00-078 is rescinded and that, pursuant to CWC §13263 and §13267, the City of Orange Cove, 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:

[Note: Other prohibitions, conditions, definitions, and some methods of determining compliance are contained in the attached "Standard Provisions and Reporting Requirements for Waste Discharge Requirements" dated 1 March 1991.]

A. Discharge Prohibitions

1. Discharge of wastes to surface waters or surface water drainage courses is prohibited.

2. Discharge of waste classified as 'hazardous,' as defined in §2521(a) of Title 23, CCR, §2510 et seq., or 'designated,' as defined in CWC §13173, is prohibited.

3. Bypass or overflow of untreated or partially treated waste is prohibited, except as allowed in Provision E.2 of Standard Provisions and Reporting Requirements.

4. Recycling of effluent to areas without valid water recycling requirements or waiver of said requirements is prohibited**.**

5. Cross-connections between any potable water supply and piping containing recycled water are prohibited. As such, no physical connection shall exist between recycled water piping and any domestic water supply well, or between recycled water piping and any irrigation well that does not have an air gap or reduced pressure principle device.

B. General Discharge Specifications

1. The monthly average daily dry weather flow shall not exceed 0.9 mgd until the appropriate Provisions are satisfied subject to Executive Officer approval, as summarized below.

	Permitted Maximum Value, mgd		
Discharge Flow Limitation	(Provision H.6)	(Provision H.7)	(Provision H.8)
Monthly Average Dry Weather Flow[1]	1.1	1.4	2.0
Monthly Average Wet Weather Flow[2]	2.2	2.5	3.0

[1] May through October
[2] November through April

2. Effluent discharged to storage ponds shall not exceed the following limitations:

Constituent	Units	Monthly Average [1]	Daily Maximum
Settleable Solids	mL/L	0.1	0.2
BOD_5[2]	mg/L	10	30
TSS[3]	mg/L	10	30
Total Nitrogen	mg/L	10[4]	15[4]

[1] Average value for all samples collected within a calendar month
[2] 5-day biochemical oxygen demand
[3] Total suspended solids
[4] Effective upon satisfaction of Provision H.6

3. The arithmetic mean of BOD_5 and of 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 approximately the same times during the same period (80 percent removal).

4. The discharge shall not have a pH less than 6.0 or greater than 9.0.

5. The monthly average EC of the discharge shall not exceed the flow-weighted average EC of the source water plus 500 μmhos/cm, a total of 700 μmhos/cm, or what is necessary to comply with groundwater limitations, whichever is less. The flow-weighted average for the source water shall be a moving average for the most recent twelve months.

6. The Discharger shall preclude public access to the waste treatment and effluent storage facilities through methods such as fences and signs, or other acceptable means.

7. Objectionable odors originating at the WWTF shall not be perceivable beyond the limits of the waste treatment areas and effluent storage ponds at an intensity that creates or threatens to create nuisance conditions.

8. As a means of discerning compliance with Discharge Specification B.7, the dissolved oxygen content in the upper zone (one foot) of wastewater in all ponds shall not be less than 1 mg/L.

9. Ponds shall be managed to prevent breeding of mosquitoes. In particular.

   a. An erosion control plan should assure that small 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 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.

10. Freeboard shall never be less than two feet in any pond (measured vertically) or lesser freeboard if certified in writing by a California registered civil engineer as adequate to prevent overtopping, overflows, or levee failures.

11. As a means of discerning compliance with Discharge Specification B.10, the Discharger shall install and maintain in each pond permanent markers with calibration indicating the water level at design capacity and available operational freeboard. Upon the Discharger's written request, specific WWTF ponds may be exempt from this requirement. Such exemptions shall be subject to the Executive Officer's written approval.

12. The WWTF shall be designed, constructed, operated, and maintained to prevent inundation or washout due to floods with a 100-year frequency.

13. Storage 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.

14. On **15 November** of each year, available storage capacity in storage ponds shall be at least equal to the volume necessary to comply with Discharge Specification B.13.

15. 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. Tertiary Discharge Specifications

The following specifications apply exclusively to the discharge from the WWTF's tertiary treatment system for water recycling by the Orange Cove Irrigation District.

1. Treatment processes shall provide an adequately disinfected, oxidized, coagulated, clarified, and filtered wastewater consistent with Title 22 regulations.

2. The 7-sample median number of total coliform organisms (TCO) in the disinfected effluent shall not exceed: an MPN of 2.2 per 100 ml and the maximum number of TCO shall not exceed an MPN of 23 per 100 ml in more than one sample within a 30-day period. No single sample shall exceed an MPN of 240 TCO per 100 ml.

3. The chlorine contact time (CT) shall be at least 90 minutes during maximum flow. The CT (the product of chlorine contact time, in minutes, and the total chlorine residual concentration, in mg/L) shall be at least 450.

4. The wastewater shall not exceed: a daily average of 2 nephelometric turbidity units (NTU), 5 NTU more than five percent of the time during any 24-hour period, and 10 NTU at any time.

D. Recycling Specifications

The following specifications apply to the use areas under the ownership and control of the Discharger.

1. Use of recycled water as permitted by this Order shall comply with all the terms and conditions of the most current Title 22 provisions.

2. All uses of recycled water shall provide for appropriate backflow protection for potable water supplies as specified in Title 17, CCR, §7604, or as specified by DHS.

3. Recycled water shall remain within the permitted Use Area (as defined in Finding 10).

4. Use of recycled water shall be limited to flood irrigation of fodder, fiber, seed crops, and of crops that undergo extensive commercial, physical, or chemical processing before human consumption.

5. Application of wastewater and commercial fertilizer to use areas shall be at reasonable agronomic rates considering the crop, soil, climate, and irrigation management system in accordance with the use area management plan required under Provision H.10 of this Order, subject to Executive Officer approval. The annual nutrient loading of use areas, including the nutritive value of organic and chemical fertilizers and of the recycled water shall not exceed the crop demand.

6. The Discharger shall maintain the following setback distances from areas irrigated with undisinfected secondary recycled water in the City Use Area:

Setback Distance (feet)	To
25	Property Line
30	Public Roads
50	Drainage courses
100	Irrigation and
150	Domestic wells

7. The perimeter of use areas shall be graded to prevent ponding along public roads or other public areas.

8. Areas irrigated with recycled water shall be managed to prevent breeding of mosquitoes. More specifically:

   a. Applied irrigation water must infiltrate completely within 48 hours after application.

   b. Ditches not serving as wildlife habitat should be maintained free of emergent, marginal, and floating vegetation.

   c. Low-pressure and unpressurized pipelines and ditches accessible to mosquitoes shall not be used to store recycled water.

9. Recycled water shall be managed to minimize runoff onto adjacent properties not owned or controlled by the Discharger.

10. Recycled water used for irrigation shall be managed to minimize erosion.

11. Recycled water shall be managed to minimize contact with workers.

12. If recycled water is used for construction purposes, it shall comply with the most current edition of *Guidelines for Use of Recycled Water for Construction Purposes*. Other uses of recycled water not specifically authorized herein shall be subject to the approval of the Executive Officer and shall comply with Title 22.

13. Public contact with recycled water shall be precluded through such means as fences and signs, or acceptable alternatives. Signs with proper wording (shown below) of a size no less than four inches high by eight inches wide shall be placed at all areas of public access and around the perimeter of all areas used for effluent disposal or conveyance to alert the public of the use of recycled water. All signs shall present the international symbol similar to that shown in Attachment G and present the following wording:

RECYCLED WATER - DO NOT DRINK

AGUA DE DESPERDICIO RECLAMADA - POR FAVOR NO TOME

E. Sludge Specifications

Sludge in this document means the solid, semisolid, and liquid residues removed during primary, secondary, or advanced wastewater treatment processes. Solid waste refers to grit and screening material generated during preliminary treatment. Residual sludge means sludge that will not be subject to further treatment at the WWTF. Biosolids refers to sludge that has been treated and tested and shown to be capable of being beneficially and legally used pursuant to federal and state regulations as a soil amendment for agriculture, horticulture, and land reclamation activities.

1. Sludge and solid waste shall be removed from screens, sumps, ponds, clarifiers, etc. as needed to ensure optimal plant operation.

2. Treatment and storage of sludge generated by the WWTF shall be confined to the WWTF property and conducted in a manner that precludes infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitations.

3. Any storage of residual sludge, solid waste, and biosolids on property of the WWTF shall be temporary and controlled and contained in a manner that minimizes leachate formation and precludes infiltration of waste constituents into soils in a mass or concentration that will violate groundwater limitations.

4. 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, WWTF, 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.

5. Use and disposal of biosolids should comply with the self-implementing federal regulations of 40 CFR 503, which are subject to enforcement by the U.S. Environmental Protection Agency (EPA), not the Regional Board. If during the life of this Order the State accepts primacy for implementation of 40 CFR 503, the Regional Board may also initiate enforcement where appropriate.

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_5, 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 form 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

Release of waste constituents from any storage, treatment, or disposal component associated with the WWTF shall not, in combination with other sources of the waste constituents, cause groundwater within influence of the WWTF and discharge area(s) to contain waste constituents in concentrations in excess of natural background or that listed below, whichever is greater:

1. Total coliform organisms of 2.2 Most Probable Number per 100 mL.

2. Chemical constituents in concentrations that adversely affect beneficial uses, including:

a. Constituent concentrations listed below:

Constituent	Units	Limitation
EC	µmhos/cm	700
Total Dissolved Solids[1]	mg/L	450
Total Nitrogen	mg/L	10

[1] A cumulative constituent comprised of dissolved matter consisting mainly of inorganic salts, small amounts of organic matter, and dissolved gases (e.g., ammonia, bicarbonate alkalinity, boron, calcium, chloride, copper, iron, magnesium, manganese, nitrate, phosphorus, potassium, sodium, silica, sulfate, total alkalinity).

b. For constituents identified in Title 22 (refer to Finding 48 — except chloride, EC and Total Dissolved Solids — that are present in the discharge, the concentrations in the discharge or the Title 22 MCLs, whichever is more stringent. Limitations for individual constituents may be below MCLs to satisfy Groundwater Limitations G.2.c and G.2.d.

c. Toxic constituents in concentrations that produce detrimental physiological responses in human, plant, or animal life, including but not limited to, boron, chloride, and sodium in excess of concentrations in the discharge or that listed below, whichever is more stringent:

Constituent	Units	Limitation
Boron	mg/L	0.7
Chloride	mg/L	106
Sodium	mg/L	69

d. Taste- or odor-producing constituents in concentrations that cause nuisance or adversely affect beneficial uses, including, but not limited to, ammonia and ammonium ion as NH_4 in excess of 0.5 mg/L.

H. Provisions

1. The Discharger shall comply with Standard Provisions and Reporting Requirements for Waste Discharge Requirements, dated 1 March 1991, which are attached hereto and by reference a part of this Order. This attachment and its individual paragraphs are commonly referenced as Standard Provision(s).

2. The Discharger shall comply with Monitoring and Reporting Program (MRP) No. R5-2004-0008, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.

3. The Discharger shall keep a copy of this Order, including its attachments and Standard Provisions, at the WWTF for reference by operating personnel. Key operating personnel shall be familiar with its contents.

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

5. The Discharger shall use best practicable treatment and control, including proper operation and maintenance, to comply with terms of this Order.

6. **For authorization to discharge monthly average dry and wet weather flows of 1.1 and 2.2 mgd, respectively,** the Discharger shall submit certification from a California registered civil engineer that the WWTF can treat and dispose of these flows. Satisfaction of this provision is subject to written Executive Officer approval.

7. **For authorization to discharge monthly average dry and wet weather flows of 1.4 and 2.5 mgd, respectively,** the Discharger shall submit certification from a California registered

civil engineer that the WWTF can treat and dispose of these flows. Satisfaction of this provision is subject to written Executive Officer approval.

8. **For authorization to discharge monthly average dry and wet weather flows of 2.0 and 3.0 mgd, respectively,** the Discharger shall submit certification from a California registered civil engineer that the WWTF can treat and dispose of these flows. Satisfaction of this provision is subject to written Executive Officer approval.

9. **Within 90 days following satisfaction of Provision H.6,** the Discharger shall submit a technical report that contains a characterization of the discharge for constituents identified in Title 22 (as described in Finding 48). The report shall describe the sampling program utilized to characterize the discharge, shall be prepared in accordance with Provision H.4, and is subject to Executive Officer approval.

10. **Within 150 days following satisfaction of Provision H.6,** the Discharger shall submit a technical report describing a management plan for the Use Area that ensures wastewater and commercial and/or organic fertilizer will be applied to the Use Area at reasonable agronomic rates considering the crop, soil, climate, and irrigation management system. The report shall describe the types of crops to be grown and harvested annually, crop water use, nitrogen uptake, and supporting data and calculations for monthly water and yearly nutrient balances. The technical report shall include a map showing locations of all domestic and irrigation wells that are within and near the Use Area, areas of public access, locations and wording of public warning signs, and setback distances from irrigation and domestic wells, property boundaries, and roads. The technical report submitted pursuant to this Provision shall be prepared in accordance with Provision H.4 and is subject to Executive Officer approval.

11. **Within 10 days** following any change in WWTF personnel that results the WWTF not being supervised by at least a Grade III operator, the Discharger shall provide written notification to the Regional Board that describes measures, and an implementation schedule, to ensure compliance with Title 23, CCR, §3680(a).

12. **Hydrogeologic Investigation and Groundwater Monitoring Tasks.** The Discharger shall complete a hydrogeologic investigation within the area affected and potentially affected by the WWTF and its discharge(s) to land. The technical report documenting the hydrogeologic investigation shall describe the area's hydrogeology, existing wells (active and otherwise), local well construction practices and standards, well restrictions, and groundwater extraction and recharge patterns. The technical report shall also discuss the potential horizontal and vertical extent of percolated effluent and adverse effects on receiving water quality from the WWTF and its discharge(s) to land. The technical report shall recommend and justify specific monitoring zones for determination of compliance with this Order's groundwater limitations and Provision H.5 regarding BPTC implementation. Following completion of its hydrogeologic investigation, the Discharger shall submit a technical report describing a modified groundwater monitoring well network. The technical report shall consist of a monitoring well installation work plan that satisfies Attachment F, *Standard Monitoring Well Provisions for Waste Discharge Requirements*.

The network shall include one or more background monitoring wells and sufficient number of designated monitoring wells to evaluate performance of BPTC measures and compliance with this Order's groundwater limitations. These include monitoring wells immediately downgradient of representative treatment, storage, and disposal units that do or may release waste constituents to groundwater with the exception of wastewater Use Areas to which the Discharger applies effluent at reasonable agronomic rates.

All wells shall comply with appropriate standards as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981), and any more stringent standards adopted by the Discharger or county pursuant to CWC §13801. The existing well network will be evaluated as part of this effort, and the proposed network should include existing monitoring wells where they will serve to measure compliance or provide other relevant information (e.g., depth to groundwater) and recommend their destruction if they will no longer serve a useful purpose. The Discharger shall install approved monitoring wells, properly destroy ineffective wells (as necessary), and monitor groundwater in accord with this Order's Monitoring and Reporting Program (MRP).

The Discharger shall continue to monitor groundwater in existing monitoring wells in accordance with the MRP unless and until individual existing wells are removed from the approved network. After the first sampling event, the Discharger shall report on its sampling protocol as specified in this Order's MRP. After one year of monitoring, the Discharger shall characterize natural background quality of monitored constituents in a technical report. The Discharger shall comply with the following compliance schedule in implementing the work required by this Provision:

	Task	Compliance Date
a.	Submit technical report: hydrogeologic investigation	**Within 180 days following satisfaction of Provision H.6**
b.	Submit technical report: revised monitoring well installation work plan	**120 days** following completion of task a
c.	Implement monitoring well installation work plan	**30 days** following completion of task b
d.	Complete monitoring well installation and well destruction and commence groundwater monitoring	**60 days** following completion of task c
e.	Submit technical report: monitoring well installation report of results	**30 days** following completion of task d
f.	Submit technical report on sampling procedures and proposed Data Analysis Methods as described in the MRP	**1st day of the second month** following the first sampling event

Task	Compliance Date
g. Submit technical report: natural background quality	**365 days** following completion of task e

Technical reports submitted pursuant to this Provision shall be subject to the requirements of Provision H.4 and are subject to Executive Officer approval.

13. Compliance with groundwater limitations will be evaluated based on data collected following completion of Provision H.12, task g. Should the Discharger fail to comply with the schedule to characterize natural background groundwater quality by the date specified in Provision H.12, task g, the Regional Board shall not consider the lack of natural background characterization as sufficient defense to enforcement for violations of Groundwater Limitations G.1 and G.2

14. **BPTC Evaluation Tasks**. The Discharger shall propose a work plan and schedule for a systematic and comprehensive technical evaluation of each major component of the WWTF's waste treatment and control to determine for each waste constituent BPTC as required by Resolution 68-16. The technical report describing the work plan and schedule shall contain a preliminary evaluation of each component and propose a time schedule for completing the comprehensive technical evaluation.

    Following completion of the comprehensive technical evaluation, the Discharger shall submit a technical report describing the evaluation's results and critiquing each evaluated component with respect to BPTC and minimizing the discharge's impact on groundwater quality. Where deficiencies are documented, the technical report shall provide recommendations for necessary modifications (e.g., new or revised salinity source control measures, WWTF component upgrade and retrofit) to achieve BPTC and identify the source of funding and proposed schedule for modifications. The schedule shall be as short as practicable but in no case shall completion of the necessary modifications exceed four years past the Executive Officer's determination of the adequacy of the comprehensive technical evaluation, unless the schedule is reviewed and specifically approved by the Regional Board. The technical report shall include specific methods the Discharger proposes as a means to measure processes and assure continuous optimal performance of BPTC measures. The Discharger shall comply with the following compliance schedule in implementing the work required by this Provision:

Task	Compliance Date
a. Submit technical report: work plan and schedule for comprehensive evaluation	**Within 6 months following satisfaction of Provision H.6**
b. Commence comprehensive evaluation	**30 days** following Executive Officer approval of task a

Task	Compliance Date
c. Complete comprehensive evaluation	As established by task a or 2 years following task b, whichever is sooner
d. Submit technical report: comprehensive evaluation results	**60 days** following completion of task c, or three years following Order adoption, whichever is sooner
e. Include in its annual report (described in the MRP) a description of the overall status of BPTC implementation and compliance with interim groundwater limitations over the past reporting year	Annually on **1 February** following completion of task d

Technical reports submitted pursuant to this Provision shall be prepared in accordance with Provision H.4 and are subject to Executive Officer approval as to adequacy.

15. By three years following satisfaction of Provision H.6, the Discharger shall submit a technical report that proposes specific numeric groundwater limitations for each waste constituent that reflects full implementation of BPTC and compliance with the most stringent applicable water quality objectives for that waste constituent. The most stringent applicable water quality objective shall be interpreted based on the Regional Board policy entitled "Application of Water Quality Objectives" on pages IV-21 through IV-23 of the Basin Plan. If the Discharger wishes the Regional Board to consider a proposed water quality limitation that is less stringent than the most stringent water quality objective necessary to protect the most sensitive beneficial use (e.g., sprinkler application of citrus trees), it must provide documentation necessary to support the proposed limitation. For example, where the stringency of a proposed water quality objective can vary according to land use and other factors, and the Discharger's BPTC cannot assure the most stringent objective will be met, the Discharger must provide documentation that a less stringent but attainable water quality objective is protective of all existing and probable beneficial uses. This documentation must be from public agencies and organizations with appropriate expertise and authority relative to the uses potentially affected by the less stringent objective, or the water necessary to sustain the uses. The Discharger should submit results of a validated groundwater model or other hydrogeologic information to support its proposal.

16. Upon completion of tasks set forth in Provisions H.12 and H.14, the Regional Board shall consider the evidence provided by the Discharger in determining whether the Discharger has justified its treatment and control methods as BPTC. Further, the Regional Board shall consider the Discharger's proposed waste-specific numeric groundwater limitation that both reflects full implementation of BPTC and complies with the applicable governing water quality objective. The Regional Board shall reopen and revise this Order to contain conditions designed to assure full implementation of BPTC and compliance with the maximum permissible groundwater limitation consistent with Resolution 68-16.

17. **At least 90 days prior** to termination or expiration of any lease, contract, or agreement involving designated use areas or offsite use of effluent used to justify the capacity authorized herein and assure compliance with this Order, the Discharger shall notify the Regional Board in writing of the situation and of what measures have been taken or are being taken to assure full compliance with this Order.

18. The Discharger shall not allow pollutant-free wastewater to be discharged into the WWTF collection, treatment, and disposal systems in amounts that significantly diminish the system's capability to comply with this Order. Pollutant-free wastewater means stormwater (i.e., inflow), groundwater (i.e., infiltration), cooling waters, and condensates that are essentially free of pollutants.

19. The Discharger shall report to the Regional Board any toxic chemical release data it reports to the State Emergency Response Commission within 15 days of reporting the data to the Commission pursuant to §313 of the "Emergency Planning and Community Right to Know Act of 1986." If the Regional Board determines that the toxic waste constituent had or has a reasonable potential to cause or contribute to violation of a water quality objective, the Regional Board may reopen this Order and prescribe an effluent limitation for the constituent.

20. If the Regional Board determines that waste constituents in the discharge have reasonable potential to cause or contribute to an exceedance of a limit for groundwater, this Order may be enforced or, alternately, reopened for consideration of addition or revision of appropriate numerical effluent or groundwater limitations for the problem constituents.

21. 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 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 Board by letter when it returns to compliance with the time schedule. Violations may result in enforcement action, including Regional Board or court orders requiring corrective action or imposing civil monetary liability, or in revision or rescission of this Order.

22. 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 this office. 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 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. Transfer shall be approved or disapproved in writing by the Executive Officer.

23. The Regional Board will review this Order periodically and will revise requirements when necessary.

I, THOMAS R. PINKOS, 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 30 January 2004.

original signed by

_____

THOMAS R. PINKOS, Executive Officer

Order Attachments:

Monitoring and Reporting Program
A. Vicinity Map – WWTF
B: Plan View - WWTF
C: Flow Diagram – Existing WWTF
D. Flow Diagram – Expansion Project
E. Vicinity Map – Improvement Districts
F. Standard Monitoring Well Provisions for Waste Discharge Requirements
G. Recycled Water Sign Symbol
H. Recommended Use Area Reporting Form
Information Sheet
Standard Provisions (1 March 1991 version) (separate attachment to Discharger only)

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CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2004-0008
FOR
CITY OF ORANGE COVE
WASTEWATER TREATMENT FACILITY
FRESNO COUNTY

This Monitoring and Reporting Program (MRP) is required pursuant to California Water Code §13267. The Discharger shall not implement any changes to this MRP unless and until the Regional Board adopts or the Executive Officer issues a revised MRP. Sample station locations are depicted on Attachment D. Changes to sample locations shall be established with concurrence of Regional Board's staff, and a description of the revised stations shall be submitted to the Regional Board and, following approval of the Executive Officer, attached by the Discharger to its copy of this Order. All samples shall be representative of the volume and nature of the discharge or matrix of material sampled. The time, date, and location of each sample shall be recorded on the sample chain of custody form. All analyses shall be performed in accordance with Standard Provisions, Provisions for Monitoring. The results of analyses performed in accordance with specified test procedures, taken more frequently than required at the locations specified in this MRP, shall be reported to the Regional Board and used in determining compliance.

Field test instruments (such as pH) may be used provided that:

1. the operator is trained in the proper use of the instrument;
2. the instruments are calibrated prior to each use;
3. instruments are serviced and/or calibrated by the manufacturer at the recommended frequency; and
4. field calibration reports are submitted as described in the "Reporting" section of this MRP.

Each laboratory report shall clearly identify the following:

1. analytical method;
2. measured value;
3. units;
4. what constituent a value is reported as;
5. method detection limit (MDL);
6. reporting limit (RL) (i.e., a practical quantitation limit or PQL); and
7. documentation of cation/anion balance for general minerals analysis of supply water and groundwater samples.

All laboratory results shall be reported down to the MDL. Non-detected results shall be reported as less than the MDL (<MDL). Results above the MDL, but below the concentration of the lowest calibration standard for multipoint calibration methods or below the reporting limit for other methods shall be flagged as estimated.

Analytical procedures shall comply with the methods and holding times specified in: *Methods for Chemical Analysis of Water and Wastes* (EPA-600/4-79-020, 1983); *Methods for Determination of Inorganic Substance in Environmental Samples* (EPA/600/R-93/100, 1993); *Standard Methods for the Examination of Water and Wastewater*, *20th Edition* (WEF, APHA, AWWA); and *Soil, Plant and Water Reference Methods for the Western Region, 2003,* 2nd Edition, 2003 (hereafter Western Region Methods).

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

INFLUENT MONITORING

The Discharger shall collect influent samples at the headworks of the treatment facility prior to any treatment of waste. Influent monitoring shall include at least the following:

Constituent	Units	Type of Sample	Sampling Frequency
Flow	mgd	Continuous	Continuous
Monthly Average Daily Flow	mgd	Computed	1/Month
Annual Monthly Average Daily Flow [1]	mgd	Computed	1/Month
Settleable Solids	mL/L	Grab	1/Day [2]
pH	pH units	Grab	1/Day [2]
BOD_5 [3]	mg/L	24-hr Composite [5]	2/Week [4]
Monthly Average BOD_5	mg/L	Calculated	1/Month
TSS [6]	mg/L	24-hr Composite [5]	2/Week [4]
Monthly Average TSS	mg/L	Calculated	1/Month

1 Based on the previous twelve months

2 Daily monitoring for this constituent may exclude weekends or holidays.

3 Five-day, 20°C biochemical oxygen demand

4 On nonconsecutive days

5 Upon satisfaction of Provision H.6, 24-hour Composite sampling, as referred to in this program, shall be flow-proportioned. Until satisfaction of Provision H.6, the Discharger may substitute 24-hour, flow-proportioned composite sampling with 8-hour composite sampling conducted at equal time intervals, with a maximum of interval of two hours, during peak flow periods (8 AM to 4 PM).

6 Total Suspended Solids

SECONDARY EFFLUENT MONITORING

The Discharger shall collect effluent samples at a point in the system following treatment and before discharge to storage ponds. Effluent samples shall be representative of the volume and nature of the discharge. Secondary effluent monitoring shall include the following:

Constituent	Units	Type of Sample	Sampling Frequency[1]
Settleable Solids	mL/L	Grab	1/Day[2]
pH	pH Units	Grab	1/Day[2]
BOD_5			
Concentration	mg/L	24-hr Composite	2/Week[3]
Monthly Average	mg/L	Calculated	1/Month
Percent Removal	%	Calculated	1/Month
TSS			
Concentration	mg/L	24-hr Composite	2/Week[3]
Monthly Average	mg/L	Calculated	1/Month
Percent Removal	%	Calculated	1/Month
Salinity compounds/parameters:			
EC[4]	µmhos/cm	24-hr Composite	1/Day[2]
TDS[5]	mg/L	24-hr Composite	2/Month [6]
Chloride	mg/L	24-hr Composite	2/Month [6]
Sodium	mg/L	24-hr Composite	2/Month [6]
SAR[7]		24-hr Composite	2/Year [8]
Nitrogen Compounds			
Ammonia (as NH_3-N)	mg/L	24-hr Composite	1/Week [9]
Nitrate (as NO_3-N)	mg/L	24-hr Composite	1/Week [9]
Total Kjeldahl Nitrogen (TKN)	mg/L	24-hr Composite	1/Week [9]
Total Organic Nitrogen (as N)	mg/L	Calculated	1/Week [9]
Total Nitrogen	mg/L	Calculated	1/Week [9]
Total Organic Carbon	mg/L	24-hr Composite	1/Quarter
General Minerals [10]	mg/L	24-hr Composite	2/Year [11]
Metals [12]	µg/L	24-hr Composite	2/Year [11]
Title 22 Constituents[13]	varies	24-hr Composite	2/Year [11]

1 If results of monitoring a pollutant appear to violate discharge specifications, but monitoring frequency is not sufficient to validate violation (e.g., the monthly mean for BOD_5), or indicate a violation and potential upset of the treatment process, the frequency of sampling shall be increased to confirm the magnitude and duration of violation, if any, and aid in identification and resolution of the problem.

2 Daily monitoring for this constituent may exclude weekends and holidays.

3 On nonconsecutive days

4 Conductivity at 25°C

5 Total dissolved solids (TDS) referenced hereafter in this program shall be determined using Environmental Protection Agency (EPA) Method No. 160.1 for combined organic and inorganic TDS and EPA Method No. 160.4 for inorganic TDS or equivalent analytical procedures specified in 40 Code of Federal Regulations (CFR) Part 136.

6 Coincident with effluent EC monitoring

Footnotes continued on following page

Footnotes (continued)

[7] Sodium adsorption ratio (SAR) referenced hereafter in this program shall be determined as follows:

$$SAR = \frac{Na}{\sqrt{\frac{Ca + Mg}{2}}}$$, where Na, Ca, and Mg are in meq/L

[8] Coincident with effluent General Minerals monitoring

[9] Monitoring frequency following satisfaction of Provision H.6. Prior to this, nitrogen compounds in effluent shall be monitored at least 1/Month coincident with BOD_5 monitoring.

[10] General Minerals as referred to in this program shall include the constituents in the General Minerals Analyte List presented below.

[11] April and October, coincident with effluent EC monitoring

[12] Metals as referred to in this program shall include arsenic, barium, copper, cadmium, chromium, lead, mercury, molybdenum, selenium, silver, zinc, and nickel.

[13] Title 22 constituents referenced in this program shall, at a minimum, refer to constituents identified in the technical report submitted pursuant to Provision H.9

General Minerals Analyte List

Alkalinity (as $CaCO_3$)	Carbonate (as $CaCO_3$)	Manganese
Aluminum	Chloride	Phosphate
Bicarbonate (as $CaCO_3$)	Hardness (as $CaCO_3$)	Potassium
Boron	Iron	Sodium
Calcium	Magnesium	Sulfate

General Minerals Sample Collection and Preservation: With the exception of wastewater samples, samples placed in an acid-preserved bottle must first be filtered through a 0.45 µm nominal pore size filter. If field filtering 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.

TERTIARY EFFLUENT MONITORING

The Discharger shall collect effluent samples at a point in the system following tertiary treatment and before discharge to the ponds designated to store disinfected tertiary recycled water for unrestricted use by the Orange Cove Irrigation District. Tertiary effluent monitoring shall include the following:

Constituent	Units	Type of Sample	Sampling Frequency
Chlorine Residual [1]	mg/L	Continuous	1/Day
Turbidity [1]	NTU [2]	Continuous	1/Day
TCO [3]	MPN [4]/100 ml	Grab	1/Day [5]

[1] The Discharger shall report the daily minimum, maximum and average chlorine residual and turbidity.

[2] Nephelometric turbidity units

[3] Total coliform organisms

[4] Most probable number

[5] After consulting with DHS and obtaining its concurrence, the Discharger may submit a written request, subject to Executive Officer written approval, to reduce the frequency of TCO monitoring.

POND MONITORING

Ponds shall be sampled systematically for the parameters specified below. Freeboard shall be monitored on all storage ponds in use to the nearest one tenth of a foot. Pond monitoring shall include at least the following:

Constituent/Parameter	Units	Type of Sample	Sampling Frequency[1]
Dissolved Oxygen (DO)	mg/L	Grab[2]	1/Week
Freeboard [3]	feet [4]	Observation	1/Week

[1] If results of monitoring appear to violate discharge specifications, but monitoring frequency is not sufficient to validate violation or indicate a violation and potential upset of the treatment process (e.g., less than minimum DO concentration), the frequency of sampling shall be increased to confirm the magnitude and duration of violation, if any, and aid in identification and resolution of the problem.

[2] Samples shall be collected at a depth of one foot from each pond in use, opposite the inlet, and analyzed for DO. Samples shall be collected between 0700 and 0900 hours. If DO results for any pond in use indicate noncompliance with the discharge specification, the Discharger shall implement corrective measures as specified in the operation and maintenance manual and monitor said pond daily until its DO stabilizes above 1 mg/L.

[3] Freeboard monitoring applies to storage ponds only.

[4] Freeboard shall be monitored to the nearest tenth of a foot.

In addition, the Discharger shall inspect the condition of storage 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 pond surface and their location; whether burrowing animals or insects are present; and the color of the ponds (e.g., dark sparkling green, dull green, yellow, gray, tan, brown, etc.). A ***summary*** of the entries made in the log during each month shall be submitted along with the monitoring report the following month. If the Discharger finds itself in violation of Discharge Specifications B.7, B.8, B.9, and B.10, the Discharger shall briefly explain the action taken or to be taken to correct the violation. The Discharger shall certify in each November monitoring report that it is in compliance with Discharge Specification B.14.

GROUNDWATER MONITORING

Prior to collecting samples and after measuring the water level, 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 typically does not exceed 3 to 5 volumes of the standing water within the well casing and screen, or additionally the filter pack pore volume. At least quarterly and concurrently with groundwater quality sampling, the Discharger shall measure the water level in each well as groundwater depth (in feet and hundredths) and as groundwater surface elevation (in feet and hundredths above mean sea level). Samples shall be collected from approved monitoring wells and analyzed for the following constituents:

Constituent/Parameter	Units	Type of Sample	Frequency
Depth to groundwater	To 0.01 foot (hundredths)	Measured	1/Quarter[1]
Groundwater elevation	Above mean sea level, to 0.01 foot	Calculated	1/Quarter[1]
pH	pH Units	Grab	1/Quarter[1]
Chemical Oxygen Demand	mg/L	Grab	1/Quarter[1]
Total Coliform Organisms	MPN/100 mL	Grab	1/Quarter[1]
Fecal Coliform[2]	MPN/100 mL	Grab	1/Quarter[1]
Fecal Streptococcus[2]	MPN/100 mL	Grab	1/Quarter[1]
Escherichia Coliform[2]	MPN/100 mL	Grab	1/Quarter[1]
Total Organic Carbon	mg/L	Grab	1/Quarter[1]
Ammonia and Ammonium ion as NH_4	mg/L	Grab	1/Quarter[1]
Nitrate (as N)	mg/L	Grab	1/Quarter[1]
TKN	mg/L	Grab	1/Quarter[1]
Total Nitrogen	mg/L	Calculated	1/Quarter[1]
EC	µmhos/cm	Grab	1/Quarter[1]
TDS	mg/L	Grab	1/Quarter[1]
SAR	None	Calculated	1/Quarter[1]
Trihalomethanes[3]	µg/L	Grab	1/Quarter[1]
Phosphorus, Total	mg/L	Grab	1/Quarter[1]
General Minerals	mg/L	Grab	1/Quarter[1]
Metals	µg/L	Grab	1/Quarter[1]
Title 22 Constituents[4]	varies	Grab	1/Year

1 January, April, July and October

2 Sampling for these shall be performed for at least two consecutive quarters in any groundwater monitoring well following the detection in that well of Total Coliform Organisms in excess of 2.2 MPN/100 ml.

3 EPA Method 601 or 8010

4 Monitoring of Title 22 constituents will be limited to wells, selected in concurrence with Regional Board staff, that are representative of groundwater reflecting the greatest impact from the WWTF and its discharges.

Additionally, the Discharger shall include in the Provision G.12 task f technical report a technical description of proposed Data Analysis Methods for evaluating groundwater monitoring data (e.g., equivalent or similar to that described in Title 27 §20415(e)(7-10)), consisting, at a minimum, methods to: (a) characterize natural background water quality of monitored constituents; (b) determine

statistically significant differences between background and compliance wells for constituents that do not have water quality objectives or have background concentrations that exceed water quality objectives; and (c) select the minimum sample size required for the proposed data analysis approach and, if greater than that required by this program (i.e., quarterly), identification of when and how the additional samples will be collected during the one-year groundwater characterization period.

The network-wide false positive rate and statistical power are directly related. That is, as the false-positive rate increases, power, the ability of the statistical test to detect an actual release, also increases. Conversely, as the false-positive rate decreases, statistical power also decreases. Strategies to minimize the network-wide false positive rate and maximize a statistical test's power generally require careful review of the analytical data set, selection of a minimum number of representative wells and constituents to compare, and a retesting procedure for wells when an elevated concentration is detected[1]. Due to the importance of these factors performing statistical analyses of groundwater data, the Discharger must also include in the Provision H.12 task f technical report a technical discussion on how it intends to (a) minimize network-wide false positive rate to less than five percent, and (b) maximize statistical power. As it continues to monitor groundwater pursuant to this program, the Discharger shall report when it deviates from the proposed Data Analysis Methods.

After one full year of groundwater monitoring, the Discharger shall analyze monitoring data from background well(s) to compute background water quality values for each monitored constituent and to perform an initial assessment of whether there is evidence of an impact from the discharge. To complete this task, the Discharger shall follow its proposed Data Analysis Methods described in the technical report required by Provision H.12 task f. Reports thereafter shall be submitted quarterly by the **1st day of the second month** after the prescribed sample collection and shall include the same analysis. The Discharger shall characterize groundwater quality using the proposed Data Analysis Method on the following:

Groundwater Constituents to Evaluate Using Data Analysis Method

Alkalinity (as $CaCO_3$)	Phosphate
Ammonia (as N)	Potassium
Boron	Sodium
Calcium	Sulfate
Chloride	TDS
Hardness (as CaCO3)	TKN
Iron	Total Nitrogen
Magnesium	TOC
Nitrate (as N)	Total Trihalomethanes

[1] A detailed discussion of these topics can be found in Addendum to Interim Final Guidance for Statistical Analysis of Groundwater Monitoring Data at RCRA Facilities, U.S. EPA, July 1992.

WATER SUPPLY MONITORING

When used to augment or serve as the supply water for the City of Orange Cove, the City's municipal groundwater wells shall be monitored as follows:

Constituent	Units	Measurement	Frequency
Quantity of Groundwater Used as Source Water	gpd	Calculated	1/Month [1]
EC [2]	µmhos/cm	Grab	2/Month [3]
TDS	mg/L	Grab	2/Month [3]
Sodium	mg/L	Grab	2/Month [3]
Chloride	mg/L	Grab	2/Month [3]

[1] A note shall be included in each SMRs stating whether groundwater is being used to supplement the surface water source supply.

[2] EC shall be reported as a flow-weighted average from supply wells. Include copies of supporting calculations with monitoring reports.

[3] Only reported if groundwater source water wells are being used to supplement the water supply.

SLUDGE MONITORING

To ensure that discharges to the WWTF are not interfering with the treatment process, the Discharger shall collect a Composite sample of sludge at least annually in accordance with EPA's *POTW Sludge Sampling And Analysis Guidance Document, August 1989,* and test for metals:

Arsenic	Copper	Nickel
Cadmium	Lead	Selenium
Molybdenum	Mercury	Zinc

Sampling records shall be retained for a minimum of five years. 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 for part of the annual report. Prior to any disposal or land application of sewage sludge, or removal of sewage sludge from the WWTF, the monitoring and record keeping requirements of 40 CFR 503 shall be met.

CITY USE AREA MONITORING

The type of crop(s) irrigated in the City Use Area, and applications of water and/or recycled water (in acre-feet) and chemical and/or organic fertilizers (in pounds of nitrogen per acre), shall be measured and reported to the Regional Board quarterly in accordance with the following schedule:

Monitoring Period	Data Due
January – March	1 May
April – June	1 August
July – September	1 November
October – December	1 February

The Discharger shall utilize the form presented in Attachment H (or variation thereof subject to Regional Board staff approval) for reporting the Use Area monitoring data.

REPORTING

Monitoring results shall be submitted to the Regional Board by the **1st day of the second month** following sample collection. Quarterly groundwater monitoring results shall be submitted separately by the **1st day of the second month** following each calendar quarter. Annual monitoring results shall be submitted by **1 February** of each year.

In reporting the monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner to illustrate clearly whether the discharge complies with waste discharge requirements. The highest daily maximum for the month, monthly and weekly averages, and medians, and removal efficiencies (%) for specified constituents should be determined and recorded.

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

By **1 February of each year**, the Discharger shall submit a written report to the Executive Officer containing the following:

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 calibration (Standard Provision C.6).
4. A statement whether the current operation and maintenance manual, and contingency plan, reflect the wastewater treatment facility 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 B.5 and a figure depicting monthly average discharge flow for the past five years.

6. The most recent annual water supply report for the City of Orange Cove.

7. A summary of the report on recycling and effluent disposal operations in the Use Area that includes for each distinct parcel monthly and annual totals of applied (a) fresh water (af/acre), (b) wastewater (af/acre), (c) total nitrogen (lbs/acre), and (d) TDS (lbs/acre). The report shall also include a water and nitrogen balance for each parcel and a summary of the crops grown.

8. A summary of sludge monitoring, including:

   a. Annual sludge production in dry tons and percent solids.

   b. A schematic diagram showing sludge handling facilities and solids flow diagram.

   c. 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 annual sludge production disposed of by each method.

      i. For **landfill disposal**, include: (a) the Order numbers of WDRs that regulate the landfill(s) used, (b) the present classifications of the landfill(s) used, and (c) the names and locations of the facilities receiving sludge.

      ii. For **land application**, include: (a) the locations of the site(s), and (b) the Order numbers of any WDRs that regulate the site(s).

      iii. For **incineration**, include: (a) the names and location of the site(s) where sludge incineration occurs, (b) the Order numbers of WDRs that regulate the site(s), (c) the disposal method of ash, and (d) the names and locations of facilities receiving ash (if applicable).

      iv. For **composting**, include: (a) the location of the site(s), and (b) the Order numbers of any WDRs that regulate the site(s).

9. A summary of pretreatment activities, including:

   a. A summary of the inspection and sampling activities conducted by the Discharger during the past year to gather information and data regarding the industrial users. The summary shall include but not be limited to, a tabulation of categories of industrial discharges that were inspected and sampled; how many and how often; and incidents of noncompliance detected.

   b. A summary of the compliance and enforcement activities during the past year of industrial users noncompliance of the local discharge limitations. The summary shall include the names and addresses of the industrial users affected by any of the following actions: warning letters, notices of violation, administrative orders, civil, criminal, assessment of monetary penalties (identify the amount of the penalties), restriction of flow to the WWTF; or disconnection from discharge to the WWTF.

10. A tabulation of all groundwater monitoring analytical data obtained during the previous four quarterly reporting periods in electronic format (e.g., Excel© spreadsheet).

11. A summary and discussion of the compliance record for the reporting period. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with this Order.

All reports submitted in response to this Program shall comply with the signatory requirements of Standard Provision B.3.

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

Original signed by

THOMAS R. PINKOS, Executive Officer

30 January 2004
(Date)

ARP/JLK/fmc:1/30/04

INFORMATION SHEET

ORDER NO. R5-2004-0008
CITY OF ORANGE COVE
WASTEWATER TREATMENT FACILITY
FRESNO COUNTY

Background

The City of Orange Cove (hereafter Discharger or City) owns and operates a wastewater collection and treatment facility (WWTF) that provides sewage service for about 8,700 residents. The WWTF currently consists of headworks, five aeration ponds (series) with an overflow pond, a sludge settling pond, a flocculation tank, micro-screens, two traveling bridge filters (parallel), a chlorination system, three spillage containment ponds (series), and four evaporation/percolation ponds (storage ponds 1 through 4). A portion of the effluent from the storage ponds is discharged via pipeline to the Orange Cove Irrigation District (hereafter District) for unrestricted use. As described below, the City plans to make improvements to and expand the WWTF (hereafter Expansion Project). The Expansion Project is described in detail in a report of waste discharge (RWD) dated 11 February 2003.

Waste Discharge Requirements (WDRs) Order No. 5-00-078, adopted by the Regional Board on 28 April 2000, limits the discharge flow to 0.9 mgd until the Discharger submits a written technical report certifying that its WWTF has adequate hydraulic and treatment capacity for a discharge of 1.0 mgd. The Discharger has not submitted this report and therefore continues to be restricted to the 0.9 mgd discharge flow limit. Order No. 5-00-078 does not reflect the configuration of the proposed Expansion Project.

In 1991, the tertiary portion of the WWTF was constructed to provide treatment to meet statewide recycling criteria for unrestricted reuse. Tertiary treatment is provided by a flocculation tank and two traveling bridge gravity shallow bed filters. Before being discharged to storage ponds, filtered effluent is discharged into a chlorine contact pipe that has a continual residual chlorine analyzer at the pipe's terminus, which discharges to the storage ponds.

Up to 3 mgd of effluent from the storage ponds may be discharged via pipelines to the District for distribution in Improvement Districts 7 and 8 (District Use Area). The District's use of recycled water on the District Use Area is regulated by Wastewater Reclamation Requirements (WRRs) Order No. 89-064. According to the District, the City provided approximately 19, 142, 150, and 46 acre-feet of effluent during 1999, 2000, 2001, and 2002, respectively, and none in 2003.

The City obtains its source water from City wells and surface water. Source water is supplied primarily from the Friant-Kern Canal after appropriate treatment and is of good quality, with an EC of about 100 µmhos/cm. An alternative water supply that is infrequently used is groundwater from the City's municipal wells, which contains elevated concentrations of nitrate attributed to agricultural (fertilizers) and residential (septic tanks) land uses. During recent years, the City has reduced its use of the groundwater supply, and reports currently using about 100 to 150 gpm, a small percentage of its daily water supply.

Some of Order No. 5-00-078 effluent limitations and monitoring requirements are listed in Table 1 below:

TABLE 1
SELECTED REQUIREMENTS AND MONITORING FREQUENCIES

Constituent	Units	Order Requirements	Monitoring Frequency
BOD_5[1]	mg/L	10[2]	Weekly
TSS[3]	mg/L	10[2]	Weekly
SS[4]	mL/L	0.1	Daily
Turbidity	NTU[5]	2.0[6]	Daily
TCO[7]	MPN[8]/100 ml	23[9]	Daily
pH	pH units	Between 6.5 and 9.0	Daily
Pond dissolved oxygen	mg/L	> 1.0	Daily

1 Five-day biochemical oxygen demand
2 Monthly average
3 Total Suspended Solids
4 Settleable Solids
5 Nephelometric turbidity units
6 Daily average
7 Total Coliform Organisms
8 Most probable number
9 Shall not exceed in more than one sample within a 30-day period

Sludge has reportedly not been removed from any of the aeration ponds since they were put into service. The City estimates that there may be as much as three feet of sludge accumulated in the initial aeration pond. The City submitted a *Sludge Management Plan,* dated August 2003, characterizing the sludge in the aeration ponds. The Plan indicates that the sludge will need to be removed prior the start of the Expansion Project, but does not include an implementation schedule for its removal.

Compliance History

The City has failed to consistently comply with the effluent limitations for BOD_5, TSS, turbidity, and TCO specified in WDRs Order No. 5-00-078. As a result, the Regional Board adopted Cease and Desist Order No. 5-00-079 (CDO) on 8 May 2000. Relevant Tasks required in the CDO are as follows:

TABLE 2
SELECTED TASKS FROM CDO

Task	Due Date	Description
1	Immediately	Cease and Desist Discharge in violation of WDRs Order No. 5-00-078
2	31 June 2000	Hire and retain a Grade III Chief Plant Operator
3.a	31 Jul 2000	Submit a comprehensive engineering evaluation of the hydraulic and treatment capacity and proposed modifications of the WWTF

Task	Due Date	Description
3.b	30 Jun 2000	Submit verification that funding has been secured for the design and construction of the WWTF
3.c.	30 Nov 2000	Submit final design of the WWTF
3.d	1 May 2001	Begin proposed Expansion Project
3.g	15 Aug 2001	Submit Operations and Maintenance Manual for new WWTF
3.i	15 Dec 2001	Complete collection system and WWTF hydraulic treatment modifications
4	30 Apr 2001	Submit an RWD for a proposed discharge flow increase
5	15 Dec 2001	Submit the measures it will implement, including restrictions on connections to the WWTF to assure reliable treatment and produces effluent quality consistent with the WDRs.

Regarding Task 2, the Discharger retained a full-time Grade III operator in November 1999. However, in January 2003, the Grade III operator resigned. The City temporarily hired a part-time Grade III operator from the City of Sanger WWTF until April 2003, when the Discharger retained Water Dynamics, a wastewater contract operator. The Discharger has not entered into a long-term contract with Water Dynamics.

Regarding Task 3.a, the Discharger submitted a technical report prepared by RM Associates dated 28 March 2001 and another prepared by Kennedy/Jenks dated 27 February 2002. The later report used some of the findings in the former and proposed to extend the time schedule in the CDO. The Expansion Project is reflected in the second report prepared by Kennedy/Jenks. Regional Board letter dated 15 May 2002 indicated that staff would recommend the Regional Board extend the time schedule in the CDO.

The deficiencies in WWTF design that will be corrected by the Expansion Project, as identified in the 27 February 2002 technical report, the Discharger's 11 February 2003 RWD and by Regional Board staff, include, but are not limited to:

- Inadequately sized influent wet well
- Excessive accumulation of sludge in existing aerated ponds
- Inadequate treatment prior to filtration
- Non-functioning flocculation tank
- Excessive algae in the treatment ponds
- Poorly designed and maintained aeration ponds that prohibit even flow distribution between the aeration ponds, causing spills and short-circuiting
- Inoperable chlorine analyzer
- Poor sampling collection techniques (specifically for TCO)

The 27 February 2002 technical report also described deficiencies in the wastewater collection system and proposed improvements that include, in part, replacing 7,000 linear feet of existing sewer mains with larger diameter pipe and constructing a new 18-inch trunk line. The Discharger completed the new trunk line in April 2003 and will complete the remainder of the improvements as funding allows.

Regarding Task 3.b, the Discharger has secured commitments from several agencies for funding of the Expansion Project. Grant funding commitments totaling over $11 million have been received from the State Water Resources Control Board, the California Department of Housing and Community Development, the State Office of Emergency Services, and the Federal Economic Development Administration. Some of the funding requirements are accompanied with special conditions prior to funding release.

Regarding Task 5, the Discharger submitted a RWD dated 11 February, followed by supplements, which was deemed complete by Regional Board letter dated 19 September 2003. The City has not completed the remainder of the CDO tasks.

The previously identified deficiencies result in continuous non-compliance with many of the effluent limitations in Order No. 5-00-078. Self-monitoring reports (SMRs) from January 2002 though April 2003 indicate chronic violations of the turbidity, TCO and TSS effluent limitations. The Discharger also failed to submit complete SMRs. A Notice of Violation (NOV) was issued 23 April 2002 for this violation. The Discharger is currently not conducting all discharge monitoring, reportedly due to the lack of monitoring equipment. It ceased monitoring turbidity, TCO, and chlorine residual in 2003 because it temporarily suspended providing effluent to the District.

Due to the inadequately sized headworks and deferred operation and maintenance, raw or partially treated wastewater was spilled on four different occasions to neighboring properties. The spills occurred on 27 May 2002 (spilled quantity unknown), 11 June 2002 (spill quantity unknown), 3 March 2003 (4,000 gallons), and 4 February 2003 (30,000 gallons). The Discharger paid the property owner $6,400 in 2002 for the cost of the olives that would have been harvested if wastewater had not been spilled and contaminated the harvest area. The Discharger was issued an NOV on 19 June 2002 for these spills. Due to poor communication within the City and its operators, the spills in 2003 were initially misreported to Regional Board staff. The Discharger was issued a NOV dated 25 February 2003 for the 2003 spills and for failing to accurately report the spills. The Discharger has since improved its spill reporting procedures and will address WWTF deficiencies in the Expansion Project.

In 2000, because of treatment deficiencies, which preclude the Discharger from disposing of effluent by providing it to the District for unrestricted reuse, and storage constraints, the Discharger initiated emergency discharges of disinfected secondary recycled water to a City-owned 40-acre farm parcel north of the WWTF. In 2000, the parcel was cropped in citrus trees, which were not harvested and later removed in 2003. The Discharger will eventually cease discharge to this parcel and develop it into a regional park.

WWTF Expansion Project

The Discharger submitted a RWD, dated 11 February 2003 and supplemented by several subsequent submittals, in support of increasing the discharge flow to a monthly dry weather daily average of 2 mgd, a monthly wet weather daily average of 3 mgd, and an annual daily average of 2.3 mgd. The RWD indicates the Expansion Project will generate an effluent containing concentrations of BOD_5, TSS, and total nitrogen of 10 mg/L or less each. The Expansion Project will consist of a new headworks, conversion of the existing first two aerated ponds to a new extended aeration activated sludge process, aerobic sludge treatment, sludge drying beds, an effluent storage pond, and water recycling use area. The Discharger also proposes to improve the existing tertiary treatment portion of the WWTF to increase its treatment capacity until the City can purchase sufficient land to bypass the tertiary facility altogether. Eventually 100 percent of the effluent will be recycled onto City-owned property planted in alfalfa.

Specifics regarding the Expansion Project include:

1. Replacement of the current headworks with a new concrete wet well structure that will include new pumps, flow meters, two influent channels (one for emergency bypass), a bar screen for larger solids, and a continual belt screen for smaller solids.

2. Modification of the two existing aeration basins to activated sludge basins with return activated sludge pumping, and two rectangular concrete settling basins with overflow weirs, an oscillating scraper system, skimming removal and sludge pumping.

3. Addition of an aeration system and blower building to supply air to the activated sludge system and the clarifier air-lifts pumps from blowers located in a new building north of the existing control building.

4. An additional 50-acre unlined effluent storage pond.

5. Sludge drying beds and an aerobic sludge digester equipped with double liners, leak detection, and leachate collection systems.

6. Aeration ponds for the activated sludge system with a compacted clay liner designed to achieve a permeability of no less than 1×10^{-7} cm/sec.

Effluent Disposal and Water Recycling

The RWD included a water balance to determine the land and storage requirements for effluent disposal. The Discharger intends to acquire a total of 425 acres of property for effluent disposal, which it plans to acquire in three phases as funding allows. While the City is acquiring this land, it will continue to provide the District with tertiary-treated effluent. A summary of the quantity of effluent that will be applied to the City and District Use Areas during each phase is as follows:

TABLE 3
QUANTITY OF WASTEWATER DISCHARGED TO USE AREAS

Phase	Flow mgd [1]	Flow Acre-feet [2]	City Use Area (acres)	To City Use Area (acre-feet)	To District Use Area (acre-feet)
1	1.1	1,670	50	200	935
2	1.4	2,080	109	442	690
3	2.0	2,580	425	1,700	0

[1] Based on a monthly average daily dry weather flow

[2] Based on the total flow for the year with varying dry and wet weather flows

The RWD included water balances for each of the phases. At full build-out, the water balance utilizes the following monthly average flows: 3.0 mgd in January and February, 2.5 mgd in March and December, 2.25 mgd in April and November, and 2.0 mgd in May through October. The assumed percolation rate of 0.011 feet/day, which minimizes percolation losses to ensure adequate storage capacity, yields a maximum annual discharge to groundwater of 440 acre-feet from the WWTF's 110 acres of storage ponds. Permeability rates of soils in the WWTF are 10 times the permeability in the water balances. Therefore, assuming that the ponds are operated at maximum capacity, the maximum annual discharge to groundwater will likely be greater.

The Discharger has characterized effluent from the Expansion Project WWTF as containing a total nitrogen of 10 mg/L or less. Assuming an irrigation rate of 1,700 acre-feet per year (full build-out), the nitrogen loading to the 425-acre Use Area will be 110 lbs/acre/year, which does not exceed agronomic demand of alfalfa, the specified Use Area crop.

The Discharger described City Use Area recycling project in a Title 22 Engineering Report (hereafter Report), dated 8 July 2003, to the California Department of Health Services pursuant to Title 22, California Code of Regulations (CCR), §60323. By letter dated 5 August 2003, DHS transmitted comments regarding the Report, which included, in summary, the following:

1. The Report does not contain the District's management practices (e.g., lack of detail of the operation and control implemented by the District to ensure end user compliance the Title 22 requirements);
2. The Report does not contain sufficient information that effluent will consistently meet Title 22 tertiary standards;
3. The Report needs a more through description of the responsibility for meeting the treatment requirements during each of the phases of the Expansion Project;
4. The Report needs to include Monitoring and Reporting that is conducted in accordance with Title 22 guidelines;
5. The Report must contain Fresno County and Regional Board contacts;
6. The Report must ensure all domestic wells within the City and District Use Area vicinities will have adequate setback distances;

7. The Report should contain a review existing areal water groundwater quality data for nitrates to characterize the baseline or background groundwater quality;
8. The Report needs to describe the design features and monitoring plan to prevent the inadvertent discharge of wastewater to the nearby Alta Canal; and
9. The Report should include specifications for ensuring that the City provide training to employees who are farming the Use Area sites;

Many of the deficiencies listed above pertain to the District Use Area, which is regulated by separate WRRs, and regard setback distances and management of the District Use Area. The Discharger has not provided written comments to DHS regarding the deficiencies in its Title 22 engineering report.

Area Land Use

The City is located at the base of the Sierra Nevada Mountain foothills; low outliers of the mountains are just east and southwest of the City. The terrain in the WWTF vicinity is flat, with a slight slope to the south and west. The WWTF is bounded by the East Branch of the Alta Canal, which is concrete lined. The area surrounding the WWTF is delineated as agricultural. Residential development occurs about one mile to the northeast.

The Bell-Carter Olive Company and its associated brine pond is on the east side of the WWTF and adjacent to storage pond 3, as shown on Attachment A. The one-acre brine pond was constructed in 1977 to store and evaporate brine wastewater, a by-product of olive processing. The brine pond was equipped with a 20-mil polyvinyl chloride liner and a percolation monitoring/leak detection system. Bell-Carter Olive Company ceased use of the brine pond in 1985 and is now investigating its closure. Site evaluations have shown groundwater passing under the brine pond contains concentrations of sodium and chloride in excess of background.

Surface Hydrology and Groundwater Conditions

Regional groundwater flows southwesterly and the depth of water occurs about 30 to 50 feet below ground surface (bgs), according to information in *Lines of Equal Elevation of Water in Wells in Unconfined Aquifer*, published by the California Department of Water Resources (DWR), 1997. Within the immediate WWTF vicinity there is a perched water table. Soils in the WWTF are classified as sandy loam and exhibit moderate to slow permeability rates. Some soils have cemented hardpan at depths of 2 to 4 feet bgs. The RWD indicates that the Discharger intends to conduct a geotechnical investigation in the location of the new proposed storage pond to provide more specific information regarding soil texture, permeability, cation exchange capacity, and chemical properties.

In February 2002, the Discharger constructed a groundwater monitoring well network in the WWTF vicinity comprised of five monitoring wells (MW): two upgradient and three downgradient. The perforated screened interval and a description of the location of each monitoring well is shown in Table 4 below.

TABLE 4
MONITORING WELL LOCATIONS

Well No.	Perforated Interval (feet bgs)	Location
MW-1	30 – 45	3,600 ft northeast and upgradient of the WWTF
MW-2	35 – 50	Upgradient of storage pond 4, likely influenced by groundwater mounding from effluent percolation
MW-3	45 – 60	Adjacent to settling pond downgradient of storage ponds 3 and 4
MW-4	53 – 63	Downgradient of aerated ponds 1 though 3
MW-5	40 – 55	Downgradient of storage pond 3 between storage ponds 1 and 2

The Discharger has been monitoring groundwater quality quarterly in the five wells since June 2002 for nitrate, ammonia, total Kjeldahl nitrogen, chloride, EC, general minerals and TCO. The average results of groundwater monitoring data the Discharger's monitoring wells from June 2002 through April 2003 are summarized in Table 5 below.

TABLE 5
GROUNDWATER QUALITY IN WWTF VICINITY

		Monitoring Wells		
		Upgradient		Downgradient
Constituent	Units	MW-1	MW-2	MW-3 – MW-5
NO_3-N	mg/L	14.6 – 26.2	< 0.2 - 0.5	< 0.1 - 3.0
EC	µmhos/cm	840 – 946	402 - 513	817 - 1,410
TDS	mg/L	537 – 600	294 - 306	533 – 883
Chloride	mg/L	94 – 124	16 - 69	99 – 168
Calcium	mg/L	87 – 105	36 - 46	29 – 96
Sodium	mg/L	40 – 45	29 - 42	98 - 178
Iron	mg/L	< 0.05 – 0.17	< 0.05 - 0.25	< 0.05 – 0.25
Manganese	mg/L	< 0.05 – 0.01	0.035 - 0.19	0.17 – 1.59

Upgradient well MW-1, intended to monitor regional background quality, is impacted by controllable, yet uncontrolled, sources of waste constituents, specifically for nitrogen. The City's General Plan Update, dated 10 April 2003, states that "the shallow groundwater underlying the City has been plagued by contamination that render certain strata's of the aquifer unusable for domestic purposes." MW-1 is likely a reflection of these impacts, as it monitors groundwater influenced by agricultural farming practices and unsewered rural residential land uses. Upgradient well MW-2, also intended to monitor regional background quality, is adjacent to a storage pond and is likely influenced by the percolation of WWTF effluent.

Downgradient monitoring wells (MW-3, MW-4, and MW-5) show reduced concentrations of nitrate and elevated concentration of TDS, iron and manganese, which is likely attributable to organic overloading from the percolation of WWTF effluent, especially through sludge accumulations at the bottom of unlined treatment and storage ponds.

Basin Plan, Beneficial Uses, and Regulatory Considerations

The WWTF is in the Orange Cove Hydrologic Unit of the Tulare Lake Basin. The *Water Quality Control Plan for the Tulare Lake Basin, Second Edition* (Basin Plan), designates beneficial uses, establishes water quality objectives, and contains implementation plans and policies for all waters of the Basin. Beneficial uses often determine the water quality objectives that apply to a water body. For example, waters designated as municipal and domestic supply must meet the maximum contaminant levels (MCLs) for drinking waters. The Basin Plan sets forth the applicable beneficial uses (industrial, agricultural, and domestic supply in this instance), the procedure for application of water quality objectives, and the process for and factors to consider in allocating waste assimilation capacity.

The beneficial uses of the Kings River as identified in the Basin Plan, include municipal and domestic supply; agricultural supply; industrial service supply; industrial process supply; water contact recreation; noncontact water recreation; warm freshwater habitat; and wildlife habitat; groundwater recharge.

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. Although a valley-wide salt drain is a desired future alternative for concentrated salt sources, Basin Plan policies and programs must focus on controlling the rate of increase of salt in the Basin from all controllable sources, and particularly point sources of waste. To this end, the Regional 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 the measure of the maximum permissible addition of salt constituents through use. A more restrictive limitation on salt constituents added through use is appropriate where necessary to assure compliance with a groundwater limitation for any constituent established by the Regional Board.

Water in the Tulare Lake Basin is in short supply, requiring importation of surface waters from other parts of the State. The Basin Plan encourages recycling and does not consider disposal by evaporation and percolation or discharge to surface waters a permanent disposal solution when the potential exists for recycling. Further, the Basin Plan requires that project reports for new or expanded wastewater facilities shall include plans for wastewater recycling or the reasons why this is not possible.

The Basin Plan requires that "Facilities which discharge or are designed to discharge in excess of 1 million gallons per day must provide removal of 80 percent or reduction to 40 mg/L, whichever is more restrictive, of both 5-day BOD_5 and suspended solids."

Further, the California Department of Health Services (DHS) has established statewide recycling criteria in Title 22, CCR, §60301 et seq., (hereafter Title 22), and guidelines for use of recycled water. Revised water recycling criteria, which became effective on 2 December 2000, 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. Further, the revised Title 22 requires that all wastewater used for recycling receive, at a minimum, secondary treatment. The Basin Plan's secondary treatment performance standard meets the Title 22 minimum criteria.

Antidegradation

In allowing a discharge, the Regional Board must comply with CWC §13263 in setting appropriate conditions. The Regional Board is required, relative to the groundwater that may be affected by the discharge, to implement the Basin Plan and consider the beneficial uses to be protected along with the water quality objectives essential for that purpose. The Regional Board need not authorize the full utilization of the waste assimilation capacity of the groundwater (CWC §13263(b)) but must consider other waste discharges and factors that affect that capacity. The Basin Plan establishes the beneficial uses for area groundwater as municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply. Procedures for application of water quality objectives to protect these uses, and the process for and factors to consider in allocating waste assimilation capacity, are set forth in the Basin Plan.

The antidegradation directives of CWC §13000 require that waters of the State that are better in quality than established water quality objectives be maintained "consistent with the maximum benefit to the people of the State." Waters can be of high quality for some constituents or beneficial uses and not others. Policies and procedures for complying with this directive are set forth in the Basin Plan (including by reference State Water Board Resolution No. 68-16, "Statement of Policy With Respect to Maintaining High Quality Waters in California," commonly referred to for convenience as Resolution 68-16 or as the "Antidegradation" Policy).

Resolution 68-16 establishes essentially a two-step process to comply with the policy. The first step is if a discharge will degrade high quality water, the discharge may be allowed if any change in water quality (a) will be consistent with maximum benefit to the people of the State, (b) will not unreasonably affect present and anticipated beneficial uses of such water, and (c) will not result in water quality less than that prescribed in State policies (e.g., water quality objectives in the Basin Plan). The second step is that any activities that result in discharges to such high quality waters are required to use the best practicable treatment and control (BPTC) of the discharge necessary to avoid a pollution or nuisance and to maintain the highest water quality consistent with the maximum benefit to the people of the State.

In authorizing waste discharges, the Regional Board evaluates each case to determine whether degradation should be allowed and then either proscribes or limits the degradation on a constituent-by-constituent basis to that which complies with Resolution 68-16. If allowing water quality degradation, the Regional Board must first find that the degradation is at least balanced by the benefit to the public of the activity creating the discharge and that the discharge is undergoing BPTC. To facilitate this process and protect their interests, dischargers must provide material and relevant technical information that fully characterizes:

- site-specific hydrogeologic conditions
- background quality of the receiving water
- background quality of other waters that may be affected by the discharge

- all waste constituents to be discharged
- waste treatment and control measures
- how treatment and control measures qualify as BPTC
- the extent that each waste constituent after BPTC will degrade the quality of the groundwater
- how the expected degradation compares to water quality objectives
- how the expected degradation is consistent with maximum public benefit

Water quality objectives

Water quality objectives (objectives) define the least stringent criteria that could apply as water quality limitations for groundwater at this location, except where natural background quality already exceeds the objective. When the Regional Board adopts objectives in the Basin Plan, it is required to comply with CWC §13241, including consideration of economics. Section 13241 does not indicate how the Regional Board is to consider economics in its decisions or emphasize any one of the §13241 factors over another. Regardless, §13241 applies to the imposition of requirements only when the Regional Board is considering whether to impose groundwater limitations more stringent than an objective (see State Water Resources Control Board (SWRCB or State Board) Order WQ 95-4, slip op. page 5). Where a Basin Plan narrative objective exists, the Regional Board can quantify it by adopting a numeric effluent or receiving water limitation in WDRs that implements the narrative objective in accordance with the translation processes set forth in the Basin Plan. The factors in CWC §13241 need not be re-evaluated in this process.

The objectives in the Basin Plan occur in numeric and narrative form. In issuing waste discharge requirements, the Regional Board must implement the Basin Plan, including all its objectives, but need not allow degradation to the objectives (CWC §13263). Narrative objectives generally specify that groundwater shall not contain constituents (e.g., chemicals, pesticides, toxic substances, taste- and odor-producing substances) in concentrations that adversely affect beneficial uses. For some narrative objectives, the Basin Plan establishes minimum numerical objectives. Basin Plan numerical objectives are the concentration thresholds necessary for the reasonable protection of beneficial uses of the water. For example, the narrative objective for chemical constituents specifies that, as a minimum, groundwaters designated for municipal supply shall not exceed MCLs. Similar objectives exist for radioactivity and pesticides. Numeric objectives based on these MCLs are in Title 22 §§64431 (Inorganic Chemicals, including Fluoride); 64443 (Radioactivity); 64444 (Organic Chemicals); and 64449 (Secondary MCLs – Consumer Acceptance Limits). Numeric objectives in the Basin Plan intended to assure protection of municipal supply also include total coliform of less than 2.2/100 mL and lead not to exceed 0.015 mg/L.

The Basin Plan objective for toxicity requires that the threshold numeric concentration be identified for each constituent to assure protection of every use. Beneficial uses exclude aquatic life in this instance as it is not a designated beneficial use of groundwater in the Basin Plan, but irrigation, animals, and municipal consumption can all be adversely affected if the concentration of a certain constituent is too high. For example, some crops experience specific-ion toxicity from boron, chloride, and sodium. Trace

elements (heavy metals typically found in trace concentrations in background water quality and common in municipal waste with industrial and commercial contributors) can adversely affect beneficial uses if in elevated concentrations.

The translation procedure to follow in establishing numerical limitations in waste discharge requirements that will implement Basin Plan narrative objectives is described in pages IV-21 through IV-23 of the Basin Plan. The Regional Board must consider, among other things, information submitted by a discharger and other interested parties and relevant numerical criteria and guidelines developed or published by other agencies and organizations on harmful concentrations of constituents. Municipal wastewater contains numerous dissolved inorganic waste constituents (i.e., salts, minerals) that together comprise total dissolved solids (TDS). Not every constituent is critical to beneficial use. The cumulative impact from these other constituents, along with the cumulative affect of the constituents that are individually listed, can be effectively controlled using TDS as a generic indicator parameter. Most dissolved inorganic substances in water are in the ionized form and so contribute to a solution's ability to carry an electrical current, or its "electrical conductivity" (EC). EC varies both with the number and type of ions the solution contains and is strongly temperature dependent. It is standard practice to report a solution's EC at 25° Celsius (this value is technically called "specific conductance"). Only ions can carry a current, however. Un-ionized species of weak acids or bases will not carry a current, nor will uncharged soluble organic materials, such as ethyl alcohol and glucose, even though these constituents comprise a portion of TDS. Although EC is affected by the nature of the various ions, their relative concentrations, and ionic strength of the water, EC measurements can give a practical estimate of the variations in a solution's dissolved mineral content. An empirical factor may be developed from simultaneous measurements of TDS and EC over a period that thereafter allows for the rapid estimation of TDS from EC measurements.

Not all TDS constituents pass through the treatment process and soil profile in the same manner or rate. Chloride is one of several that pass through both to groundwater. As chloride concentrations in the high quality groundwaters in the basin are much lower than in treated municipal wastewater, chloride is one constituent that is likely to degrade groundwater if discharged at a higher concentration than in groundwater. As a conservative constituent not attenuated in the soil profile, it is a useful indicator parameter for evaluating discharge plumes in groundwater. Another TDS constituent that might reach groundwater is nitrate, but it may show a less direct relationship due to transformations and other forms. Boron is a TDS constituent that may occur in wastewater in concentrations greater than groundwater depending on the source water, the extent residents use cleaning products containing boron, and the extent that industries that discharge to the sewerage system utilize boron (e.g., glass production, cosmetics). Waste constituents unique to municipal waste that may reach groundwater include total and fecal coliform bacteria. Still other constituents in treated municipal waste that may pass through the treatment process and the soil profile include recalcitrant organic compounds (e.g., ethylene glycol, or antifreeze), radionuclides, and pharmaceuticals (e.g., endocrine disruptors). Hazardous compounds are not usually associated with domestic wastes and when present are reduced in the discharge to inconsequential concentrations through dilution with domestic waste, treatment, and the implementation of effective pretreatment programs.

A discharge of wastewater that overloads soils with nutrients and organics can result in anaerobic conditions in the soil profile, which in turn creates organic acids and decreases soil pH. Under

conditions of low soil pH (i.e., below 5), iron and manganese compounds in the soil can solubilize and leach into groundwater. Discharge of residual sludge to land may also lead to increases in groundwater alkalinity and hardness to concentrations that impair the water's beneficial uses and contribute to an overall increase in TDS. Overloading is preventable and does not constitute BPTC as used in Resolution 68-16. Elevated concentrations in groundwater compared to percolating effluent of dissolved iron and dissolved manganese, along with elevated alkalinity, and hardness are useful indicators to determine whether components of the WWTF with high-strength waste constituents, such as sludge handling facilities, are ineffective in containing waste.

Salinity adversely affects use by animals, humans, and plants, but generally plants are the most sensitive to increasing concentrations. Salinity affects the efficiency and feasibility of irrigation in a number of ways that could violate both the toxicity and chemical narrative objectives. Increasing TDS adversely affects the availability of water from soil for use by a crop, and an increasing sodium adsorption ratio (SAR), a unitless parameter that characterizes the predominance of sodium compared to calcium and magnesium, adversely affects infiltration of water and air into soil.

Specific ions of TDS, in particular sodium, chloride, and boron, can cause increasing severity of injury to certain crops as their concentrations increase. A number of factors are involved in determining the threshold numeric concentrations that implement the Basin Plan narrative objective for toxicity (e.g., particular crops in particular climates and for particular methods of irrigation). Crops can be more tolerant to concentrations of specific ions if there is little or no contact with the leaves. Sodium and boron do not work in this way in the lower ranges, but chloride does. If applied by sprinklers on the most sensitive crops, chloride must be less than 106 mg/L, but if applied by other means it may be as high as 175 mg/L without causing injury. Even so, *Water Quality for Agriculture* cautions that in areas of high temperature and low humidity (less than 30%) crops may be more sensitive due to higher foliar absorption. Specific crops are more sensitive than others to constituents, but in general trees, vines, and woody species are the most susceptible to injury. The less conservative concentrations cited by the *Agricultural Salinity Assessment and Management* were derived from the same source used by *Water Quality for Agriculture*, and both refer to criteria developed in 1974 by the University of California Committee of Consultants made available as guidelines by the University of California Cooperative Extension in 1975**.** The less conservative criteria attributed to the *Agricultural Salinity Assessment and Management* is also in *Water Quality for Agriculture* and applies to situations where the most sensitive types of crops are not grown and constraints on method and time of irrigation provide protection to crops.

The values in Table 6 below reflect water quality limitations that must be met to maintain specific beneficial uses of groundwater. Unless natural background for a constituent proves higher, the groundwater limit established in the proposed Order must be the most stringent of the values listed for the constituent or the MCL listed in Title 22, whichever is most stringent.

TABLE 6
APPLICABLE GROUNDWATER LIMITATIONS

Constituent	Units	Value	Beneficial Use	Criteria or Justification
Ammonia and ammonium ion as NH_4	mg/L	0.5	MUN[1]	Taste and Odor[2]
Nitrate-Nitrogen	mg/L	10	MUN[1]	Primary MCL[5]
Boron	mg/L	0.7	AGR[3]	Boron sensitivity[4]
Chloride	mg/L	106	AGR[3]	Chloride sensitivity of certain crops irrigated via sprinklers[4]
Conductivity (EC)	µmhos/cm	700	AGR[3]	Salt sensitivity
pH	pH Units	6.5 to 8.5	MUN	Secondary MCL[5]
Sodium	mg/L	69	AGR[3]	Sodium sensitivity of certain crops[4]
Total Dissolved Solids	mg/L	450	AGR[3]	Salt sensitivity

1 Municipal and domestic supply
2 EU Council Directive 98/83/EC, *On the Quality of Water Intended for Human Consumption*
3 Agricultural supply
4 Ayers, R. S. and D. W. Westcot, Water Quality for Agriculture, Food and Agriculture Organization of the United Nations – Irrigation and Drainage Paper No. 29, Rev. 1, Rome (1985)
5 Title 22, CCR, §64449

Treatment Technology and Control

Depending on the discharge situation, the Regional Board to date typically has prescribed a BOD_5 limitation of 40 mg/L or less for discharges to land of secondary treated municipal waste. Given the character of municipal wastewater, secondary treatment technology had been thought generally sufficient to control degradation of groundwater from decomposable organic constituents. However, even secondary effluent percolated at sufficient rates can contain more organic carbon than can be oxidized by the residual oxygen in the effluent and soil profile.

Percolating effluent passes through progressively more oxygen-deficient conditions. Bacteria in the soil and effluent under these conditions utilize oxygen from nitrate (denitrification). Once nitrate is depleted, bacteria utilize oxygen from oxidized forms of soil manganese and iron. These are then transformed to soluble forms for which the Basin Plan prescribes numerical objectives. A discharge containing BOD_5 of less than 40 mg/L and dissolved iron and manganese far below objectives could lead to area groundwater containing these constituents in concentrations exceeding that prescribed by the Basin Plan (i.e., secondary MCLs). Treatment technology exists to achieve low effluent BOD_5 without filtration (e.g., sequencing batch reactor, oxidization ditch). Application of such technology also yields significant nitrogen removal (to below 5 mg/L).

Adding disinfection to secondary treatment significantly reduces populations of pathogenic organisms, and reasonable soil infiltration rates and unsaturated soils can reduce them further. Because disinfection is a proven BPTC measure, total coliform, the indicator parameter for pathogenic organisms, should not be found in groundwater beneath a well-designed, well-operated facility. Disinfection by chlorination

creates TTHMs, however. Generally, the higher the BOD_5 of effluent when chlorinated, the higher the concentration of TTHMs formed. Treatment to reduce TTHMs in wastewater generally has not been performed, and little is known at this point on the typical impact a municipal discharge without treatment may have on groundwater, but there are nationwide indications that wastewater discharges to surface waters are causing TTHMs to impact municipal water supplies. More information is necessary to determine the extent to which TTHMs attenuate in the soil profile and whether instances of low groundwater concentrations of TTHMs downgradient of a municipal discharge correlate with effluent with low BOD_5 (e.g., below 20 mg/L).

Municipal wastewater typically contains nitrogen in concentrations greater than objectives, which vary according to the form of nitrogen. The Basin Plan lists numerical objectives for nitrate and nitrite (Title 22, CCR, §64449, Table 64449-A). Ammonia is a taste- and odor-producing substance that, if present in excessive concentrations, can adversely affect the beneficial use of groundwater for municipal and domestic supply. The European Union (EU) has established a drinking water limit based on taste and odor for ammonia and ammonium ion as NH_4 of 0.5 mg/L (EU Council Directive 98/83/EC, *On the Quality of Water Intended for Human Consumption*). While the EU standard is a value that is to be met at the point of use (i.e., the tap, rather than the receiving water), the Basin Plan stipulates on page IV-21 that "[w]ater quality objectives apply to all waters within a surface water or ground water resource for which beneficial uses have been designated, rather than at an intake, wellhead or other point of consumption." For example, drinking water MCLs are developed for application at the point of use; but the Basin Plan applies them to ambient waters designated as municipal or domestic supply. It is appropriate and reasonable to establish a water quality limit for ammonia and ammonium ion as NH_4 of 0.5 mg/L for this location to protect beneficial use of area groundwater for human consumption. Degradation by nitrogen in a municipal discharge can be controlled by an appropriate secondary treatment system (e.g., oxidation ditch), tertiary treatment for nitrogen reduction, and agronomic reuse on crops that are harvested. The effectiveness varies, but generally BPTC measures should be able to limit nitrogen (including ammonia) degradation to a concentration well below Basin Plan objectives.

The majority of ions that compose salinity waste constituents pass through the secondary treatment process and soil profile and effective control of their long-term affects typically relies upon effective residential and industrial source control and pretreatment measures. In areas of high quality groundwater and areas where salinity objectives are exceeded despite current source control measures, evaluation of BPTC will require, at a minimum, a review of residential and industrial treatment and control technology and consideration of local discharge salinity limits for significant industrial dischargers of high EC waste streams. Unless groundwater quality already contains saline waste constituents in greater concentration than the effluent, the Regional Board and Basin Plan recognize that long-term land discharge of treated municipal wastewater will cause some degradation of groundwater from salt (as measured by TDS and EC) and the individual component ions of salts (e.g., sodium, chloride).

Treatment of trace elements (for protection of groundwater, wastewater recycling, and biosolids reuse) is generally achieved through source control, but if this proves insufficient to be found consistent with Resolution 68-16, technology is available and will need to be evaluated with respect to providing BPTC.

Title 27

Title 27, CCR, §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.

Discharges of domestic sewage and treated effluent can be treated and controlled to a degree that will not result in unreasonable degradation of groundwater. For this reason, they have 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 §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 resulting degradation of groundwater is in accordance with the Basin Plan. This means, among other things, that degradation of groundwater must be consistent with Resolution 68-16 and in no case greater than water quality objectives.

CEQA

Environmental Study Consultation Notice. The City circulated *Environmental Study Consultation for the City of Orange Cove-Wastewater Improvements Plan*, received 11 April 2002, pursuant to the California Environmental Quality Act (CEQA) and State CEQA guidelines. By letter dated 24 April 2002, staff recommended the City's environmental review describe: (1) the WWTF's components, (2) where wastewater will be contained, (3) discharge quality, (4) the risks of recycling treated municipal wastewater, (5) receiving water (groundwater) quality, and (6) mitigation measures that will be implemented to reduce groundwater impacts to less than significant levels.

Initial Environmental Study. The City circulated an Initial Environmental Study and proposed Mitigated Negative Declaration (MND), received 17 June 2002, for the Expansion Project pursuant to CEQA and State CEQA guidelines. Staff responded by letter dated 17 July 2002 and indicated that, due to the lack of detail in the environmental study and the project's potentially significant impacts to the environment, recommended the City prepare an Environmental Impact Report (EIR).

On 15 August 2003, the City certified the MND for the Expansion Project in accordance with the CEQA and State CEQA guidelines. The MND included two measures to mitigate the WWTF's project's impacts on water quality: (1) the City will implement groundwater monitoring and (2) the City will retain a certified Grade III operator.

In reviewing the above documents, Regional Board staff concludes that the mitigation measures stipulated in the MND do not sufficiently mitigate the project's impacts to groundwater quality, particularly with respect to waste constituents of concern (i.e., nitrogen, salinity, and organic decomposition and disinfection byproducts). To mitigate the project's groundwater quality impacts to less than significant levels, the terms and conditions of this proposed Order and accompanying enforcement order are appropriate and necessary.

PROPOSED ORDER TERMS AND CONDITIONS

Phased Approach

The discharge has been occurring for years. Certain waste constituents in municipal wastewater are not fully amenable to waste treatment and control and it is reasonable to expect some impact on groundwater. The Regional Board cannot yet determine how much degradation can be justified as consistent with policy due to incomplete data and incomplete evaluation of treatment and control measures. Groundwater monitoring data at this site is insufficient to establish the most appropriate numeric receiving water limitations.

Reasonable time is necessary to gather specific information about the facility and the site to make informed decisions on appropriate, long-term conditions of discharge. In October 2000 the Regional Board concurred with a two-phased approach to determining long-term conditions of discharge that fully implement the Antidegradation Policy for municipal discharges to land. If a municipal discharger is in noncompliance with certain conditions of discharge pertaining to BPTC and groundwater degradation, the Phase 1 WDRs may define the process to resolve the noncompliance. Where clearly substandard practices that violate existing WDRs have caused pollution, enforcement action in conjunction with the phased approach is appropriate. In Phase 2, the Discharger should be prepared to justify that it has implemented (or will implement) BPTC measures and propose that the Regional Board consider site-specific groundwater limitations that comply with Resolution 68-16.

This proposed Order, therefore, represents Phase 1 for the Discharger. It establishes receiving water limitations that (a) temporarily and conditionally allow use of the full assimilative capacity of the aquifer affected by the discharge and (b) assure protection of the beneficial uses of groundwater pending the completion of specific tasks. During Phase 1, degradation may occur from certain constituents, but can never exceed water quality objectives (or background water quality should it exceed the objectives) or cause nuisance.

The proposed Order would require the Discharger to conduct a BPTC evaluation of the discharge (including source control, pretreatment, treatment, and disposal). Specifically, it provides time schedules to complete specific tasks that require the Discharger to identify, implement, and adhere to BPTC and to review its present practices and upgrade as necessary. It requires that the Discharger conduct studies to identify groundwater quality limitations representative of degradation caused by full implementation of BPTC, and recommend means of monitoring and measuring compliance with BPTC and groundwater limitations.

Once it completes its BPTC evaluation in Phase 1, the Discharger shall propose for Regional Board consideration specific numeric groundwater quality limitations appropriate for this situation and with full consideration of Basin Plan concepts. Certain groundwater quality limitations may be more or less

stringent than the numeric receiving water limitations in the proposed Order. The burden, however, is on the Discharger. If seeking less stringent alternative limitations for salt constituents, for example, the Discharger must contact land use and agricultural agencies and organizations knowledgeable about cropping patterns within the area affected by the discharge and obtain documentation on what crops are grown and may be grown in the area. Until this comprehensive effort is completed, staff's preliminary research and review of land use maps prepared by DWR indicate that the discharge area supports the production of crops sensitive to boron (e.g., grapes) and crops sensitive to sodium and chloride (e.g., citrus, stone fruit, and grapes). The objective is not to suggest that the reference sources do not contain recommendations to counter damaging affects, such as not irrigating with sprinklers and not at mid-day, should there be no choice as to available water quality.

In considering the Phase 2 WDRs, the Regional Board will evaluate the Discharger's justification of BPTC implementation and its proposed groundwater limitations. It is possible upon further documentation and analysis that the discharge may be found not to be causing degradation from certain waste constituents.

Discharge Prohibitions, Specifications and Provisions

The proposed Order would carry over the current Order's monthly average daily discharge flow limit until the City completes the first phase of the Expansion Project and certifies that the WWTF can treat and dispose of a higher flow. The proposed Order would carry over the previous Order's effluent limitations for BOD_5 and TSS of 10 mg/L (monthly average) and 30 mg/L (daily maximum), which is also based on the capabilities of the proposed treatment technology. The proposed Order's Discharge Specification B.3 would implement the Basin Plan's requirement that municipal facilities designed to discharge greater than 1 mgd provide 80 percent removal efficiency of both BOD_5 and TSS. Effluent limits for total nitrogen of 10 mg/L (monthly average) and 15 mg/L (daily maximum) reflect the proposed advanced secondary treatment technology and mitigate nitrogen impacts from percolating effluent to levels below the water quality limitation for nitrate-nitrogen of 10 mg/L. This effluent limitation would go into effect once the City completes the advanced secondary treatment portion of the Expansion Project.

To ensure the necessary quality of effluent discharged to the District irrigation system, this Order would carry over the current Order's effluent limitations: (1) turbidity of a daily average of 2 nephelometric turbidity units (NTU), 5 NTU more than five percent of the time during any 24-hour period, and 10 NTU at any time, (2) TCO of a 7-day median of 2.2 MPN/100 ml, more than one same within a 30-day period of greater than 23 MPN/100 mL, and 240 MPN/100 mL at any time; and (3) the chlorine contact time (CT) shall be at least 90 minutes during maximum flow.

The proposed Order would carry over the current Order's effluent salinity limitation by requiring the monthly average effluent EC to not exceed the flow-weighted average EC of the source water plus 500 µmhos/cm. However, the proposed Order reduces the maximum effluent EC to 700 µmhos/cm to reflect the high quality of the City's predominately surface water source water supply. The reduction in the maximum effluent EC to 700 µmhos/cm will ensure groundwater influenced by the discharge maintains its beneficial use for irrigating salt sensitive crops. The discharge specifications regarding dissolved oxygen and freeboard are consistent with Regional Board policy for the prevention of nuisance conditions, and are applied to all such facilities.

The proposed Order would require the Discharger to characterize the discharge for appropriate constituents in Title 22, CCR, §§64431 (Inorganic Chemicals); 64431 (Fluoride); 64443 (Radioactivity); 64444 (Organic Chemicals); and 64449 (Secondary MCLs – Consumer Acceptance Limits).

The proposed Order would require the Discharger to comply with the provisions of Title 22. To ensure compliance with Title 22 and Regional Board recycling policies, the proposed Order would restrict the crops in the City and District Use Areas to those allowed by Title 22, and would further require the Discharger to submit a use area management plan that describes the Discharger's implementation of best management practices with respect to effluent reuse (e.g., to reuse effluent at reasonable agronomic rates considering the crop, soil, climate, and irrigation management plan).

The conditions for sludge, and solid waste proposed in the proposed Order would assure that degradation resulting from the City's management of sludge is in accordance with the Basin Plan. The proposed Order also requires that storage, use and disposal of biosolids comply with the self-implementing federal regulations of Title 40, Code of Federal Regulations (CFR) Part 503, which are subject to enforcement by the U.S. Environmental Protection Agency not the Regional Board.

The proposed Order would prescribe groundwater limitations that implement water quality objectives for groundwater from the Basin Plan in narrative and numeric form. The limitations require that the discharge not cause or contribute to exceedances of these objectives or natural background water quality, whichever is greatest. In effect, where upgradient water quality already exceeds an objective due to reasons other than natural background water quality, the Discharger will not be held accountable for contributing to the violation unless the quality of the discharge also exceeds the objective. For certain waste constituents where sufficient data is available, the proposed Order would prescribe numeric limitations derived from narrative objective as described herein. The Phase 1 process will lead to more appropriate site-specific numeric groundwater limitations, but for the proposed Order, the Regional Board must implement objectives derived primarily from the published documents of other agencies and organizations. Since the proposed Order would implement existing objectives, the Regional Board need not undertake further consideration of the factors in CWC §13241 (including economic considerations). The proposed Order would prescribe the following groundwater limitations:

Groundwater Limitation G.1, total coliform organism limitation of 2.2 MPN/100 mL, is based on the Basin Plan's objective for bacteria (i.e., the concentration of TCO over any 7-day period shall be less than 2.2 MPN/100 mL) but rephrased to allow for reduced monitoring requirements.

Groundwater Limitation G.2 implements the Basin Plan's narrative objective for chemical constituents. The value for total nitrogen of 10 mg/L in Groundwater Limitation G.2.a ensures that groundwater nitrate levels will remain at or below the Title 22 primary drinking water MCL for nitrate (45 mg/L as nitrate or 10 mg/L as N). The values for EC and for TDS in Groundwater Limitation G.2.a ensure that groundwater salinity levels will remain at or below that necessary to sustain agricultural beneficial use. The values for chemical constituents prescribed in Groundwater Limitation G.2.b reflect the Title 22 drinking water MCLs (with the exception of chloride, EC, and TDS). The allowable degradation for Title 22 constituents is limited to those constituents known to exist in the discharge. Groundwater Limitation G.2.c

implement the Basin Plan's narrative objective for toxicity and establishes numerical limitations for boron, chloride, and sodium to ensure that groundwater concentrations of these constituents will remain at or below that necessary to sustain agricultural beneficial use. Groundwater Limitation G.2.d implements the Basin Plan's narrative objective for taste- and odor-producing substances, and establishes a numerical receiving water limitation for ammonia and ammonium ion as NH_4 to ensure groundwater ammonia levels will remain at or below that necessary to protect domestic and municipal uses.

The proposed Order would require the Discharger to evaluate the uppermost aquifer within the area affected and potentially affected by the WWTF and its discharge(s) to land. The Basin Plan states that water quality objectives "apply to all waters within a surface or ground water resource for which beneficial uses have been designated, rather than at an intake, wellhead or other point of consumption." The proposed Order would require the City to evaluate its existing groundwater monitoring network for adequacy. An effective monitoring network includes wells in portions of the aquifer affected by the discharge. This includes the uppermost aquifer and may include deeper portions depending on the rate of percolation and local hydrogeologic conditions. The network shall include one or more background monitoring wells and sufficient number of wells to determine compliance with the proposed Order's groundwater limitations and evaluate performance of BPTC measures. These include monitoring wells immediately downgradient of representative treatment, storage, and disposal unit that does or may release waste constituents to groundwater with the exception of wastewater Use Areas to which the Discharger applies effluent at reasonable agronomic rates. Benefits of groundwater monitoring in wastewater recycling areas does not justify the cost, provided the rates of wastewater application do not exceed reasonable agronomic rates. Beneficial recycling of wastewater conserves freshwater resources and is encouraged by the Basin Plan and SWRCB Resolution No. 77-1. To this end, the SWRCB and other agencies issued a joint "Statement of Support for Water Reclamation" in 1994 promising to reduce regulatory constraints and disincentives to wastewater recycling. The impact on groundwater from use of municipal wastewater for irrigation at agronomic rates should not be significantly greater than extracted fresh water used for irrigation.

Completion of the hydrogeologic investigation described in Provision H.12 will provide necessary information to evaluate the adequacy of existing and proposed groundwater monitoring well locations. Wells must be installed to measure the quality of water for comparison with proposed groundwater limitations. The proposed Order provides a schedule for proposing, then providing the monitoring network. Until the network is installed, the Regional Board cannot adequately evaluate compliance with groundwater limitations. Use of existing groundwater monitoring wells will continue for the purposes of monitoring the effects of the discharge on the uppermost layer of groundwater until an alternate network suitable for evaluating the effectiveness of BPTC and compliance with groundwater limitations is approved by the Executive Officer in accord with the process outlined in the proposed Order.

Monitoring Requirements

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

the conditions of discharge. Section 13268 of the CWC authorizes assessment civil administrative liability where appropriate.

The Title 27 zero leakage protection strategy relies heavily on extensive groundwater and unsaturated zone monitoring to increase a discharger's awareness of, and accountability for, compliance with the prescriptive and performance standards. With a high volume, concentrated, uncontained discharge to land, monitoring takes on even greater importance.

The proposed Order would carry over most of the monitoring requirements of the current Order, in part, to check compliance with various discharge specifications. The proposed Order would require the Discharger to monitor sludge at least annually in accordance with EPA's *POTW SLUDGE SAMPLING AND ANALYSIS GUIDANCE DOCUMENT, AUGUST 1989,* and test for arsenic, cadmium, molybdenum, copper, lead, mercury, nickel, selenium, and zinc. The proposed Order would require the Discharger to submit an annual summary of sludge discharge operations.

The proposed Order would require the Discharger to monitor groundwater for constituents present in the discharge that are capable of reaching groundwater and violating groundwater limitations if its treatment and control, and any dependency of the process on sustained environmental attenuation, proves inadequate. Accordingly, the proposed Order would require installation of an effective groundwater monitoring network that includes monitoring points represented by wells forming a vertical line that extends from the soil surface into the uppermost layer of water in the uppermost aquifer. One or more wells will monitor the quality of groundwater unaffected by the discharge and serve as 'background.' Other monitoring wells will be for determining compliance with proposed groundwater limitations. As some groundwater limitations are based on background water quality, it is essential that the Discharger install wells in a location that can provide groundwater quality representative of the discharge area but unaffected by both the discharge and other concentrated sources of waste sources. The proposed Order would require the Discharger to install such well(s) and characterize background water quality over a one-year period of quarterly groundwater sampling events.

The monitoring requirements of the current and proposed Orders, with respect to source water, influent, effluent, and groundwater, are summarized in Table 7 below.

TABLE 7
CURRENT AND PROPOSED MONITORING REQUIREMENTS

		Influent		Effluent		Groundwater	
Constituent	Units	current	proposed	current	proposed	current	proposed
SS	mL/L	D[1]	D	D	D	--	--
BOD_5	mg/L	W[2]	2/W	W	2/W	--	--
TSS	mg/L	W	2/W	W	2/W	--	--
TCO	MPN/100 mL	--	--	D	D	--	Q[3]
pH	pH units	D	D	D	D	--	Q
EC	µmhos/cm	--	--	D	D	Q	Q
TDS	mg/L	--	--	Y[4]	2/M[5]	Q	Q
Nitrate (as N)	mg/L	--	--	Q	1/W[6]	Q	Q
TKN	mg/L	--	--	Q	1/W[6]	Q	Q

		Influent		Effluent		Groundwater	
Constituent	Units	current	proposed	current	proposed	current	proposed
Ammonia (as N)	mg/L	--	--	Q	1/W[6]	Q	Q
Turbidity	NTU	--	--	C[7]	C	--	--
Chlorine Residual	mg/L	--	--	D	D	--	--
TOC[8]	mg/L	--	--	--	Q	--	Q
General Minerals	mg/L	--	--	Y	2/Y	Q	Q
Metals	µg/L	--	--	--	2/A	--	2/Y
Title 22 Constituents	varies	--	--	--	2/Y	--	Q
THMs[9]	µg/L	--	--	--	2/M[10]	--	Q

[1] D = day

[2] W = week

[3] Q = quarter

[4] Y = year

[5] M = month

[6] Effective once the advanced secondary treatment portion of the Expansion Project is completed. Before then, monitoring frequency will be 1/M.

[7] C = continuous (i.e., via meter)

[8] Total Organic Carbon

[9] Trihalomethanes (THMs)

[10] Only when chlorinating effluent

As indicated above, the proposed Order would increase the number and frequency of monitored constituents in the discharge. This is to develop a more accurate characterization of the discharge.

The proposed Order would require the Discharger to monitor source water for quarterly for EC to determine whether or not the Discharger is in compliance with Discharge Specification B.5. To monitor storage ponds for capacity constraints and potential nuisance conditions, the proposed Order would require the Discharger to monitor freeboard available and dissolved oxygen content weekly.

The proposed Order would require the Discharger to monitoring the groundwater for additional constituents to develop a more accurate characterization of the groundwater and how it is impacted by the discharge. The additional of THMs as a groundwater constituent is to determine whether the groundwater conditions and the organic carbon content of the wastewater when it is chlorinated is impacting the groundwater with THMs.

Reopener

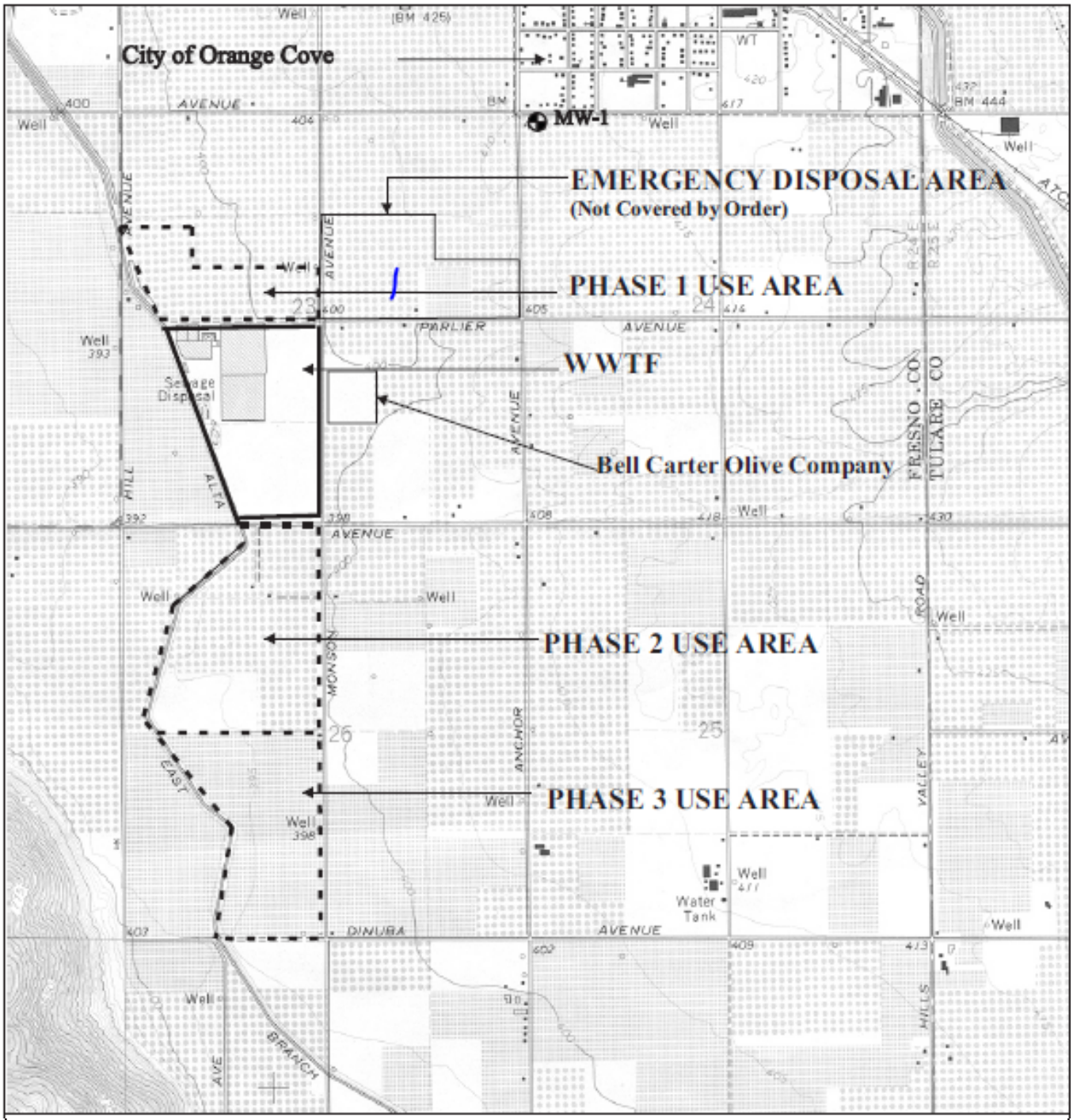
The conditions of discharge in the proposed Order were developed based on currently available technical information and applicable water quality laws, regulations, policies, and plans, and are intended to assure conformance with them as requires and the CWC. However, information is presently insufficient to develop final effluent and groundwater limitations, so the proposed Order would set limitations for the interim while site-specific, constituent-specific limits are developed in conjunction

with a BPTC evaluation, including source control and pretreatment. Additional information must be developed and documented by the Discharger as required by schedules set forth in the proposed Order. As this additional information is obtained, decisions will be made concerning the best means of assuring the highest water quality possible.

Proposed Enforcement Order

The Discharger cannot consistently comply with the effluent limitations in the existing Order and the proposed Order due to deficiencies in WWTF design, operation, and maintenance. The compliance deadlines in the existing CDO have expired due, in part, to the lack of funding of the Expansion Project. The Discharger is obtaining land to increase its disposal capacity so it may recycle undisinfected secondary recycled water on alfalfa and cease relying on providing the District disinfected tertiary recycled water for effluent disposal. Modification of the WWTF to improve treatment capacity for the existing flow and for the proposed increase in treatment capacity will occur in phases. Staff is recommending that the Regional Board consider an accompanying tentative Cease and Desist Order that would require the Discharger to perform a series of tasks according to a time schedule to complete the Expansion Project, as well as remove accumulated sludge from existing ponds.

ARP/JLK/fmc:1/30/04



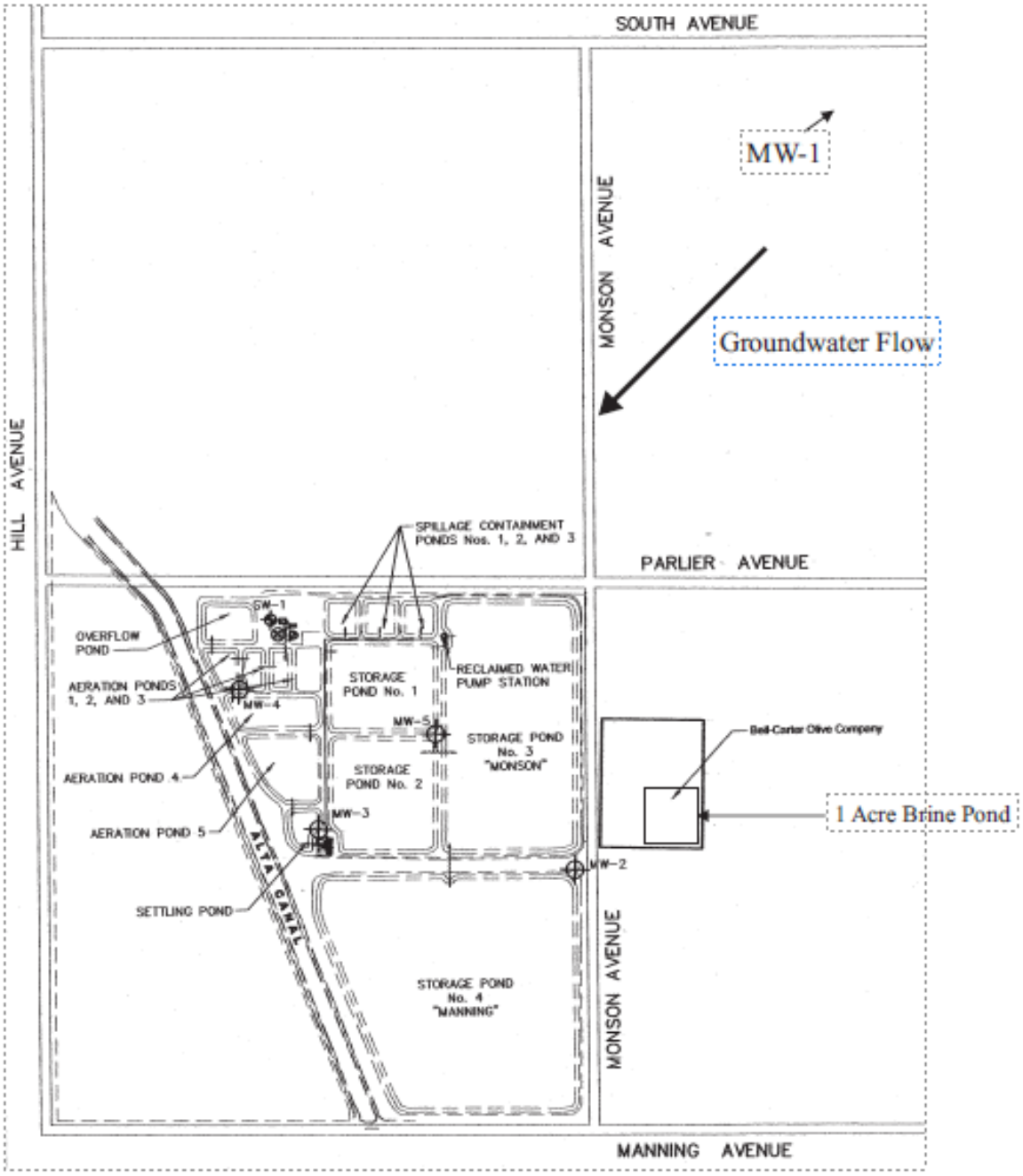
ATTACHMENT A
WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2004-0008
VICINITY MAP - WWTF
CITY OF ORANGE COVE
WASTEWATER TREATMENT FACILITY
FRESNO COUNTY

N

SECTION 23, T15S, R24E, MDB&M
USGS 7.5 ORANGE COVE SOUTH QUADRANGLE

PROPERTY TO ACQUIRE IN PHASES

CITY-OWNED PROPERTY



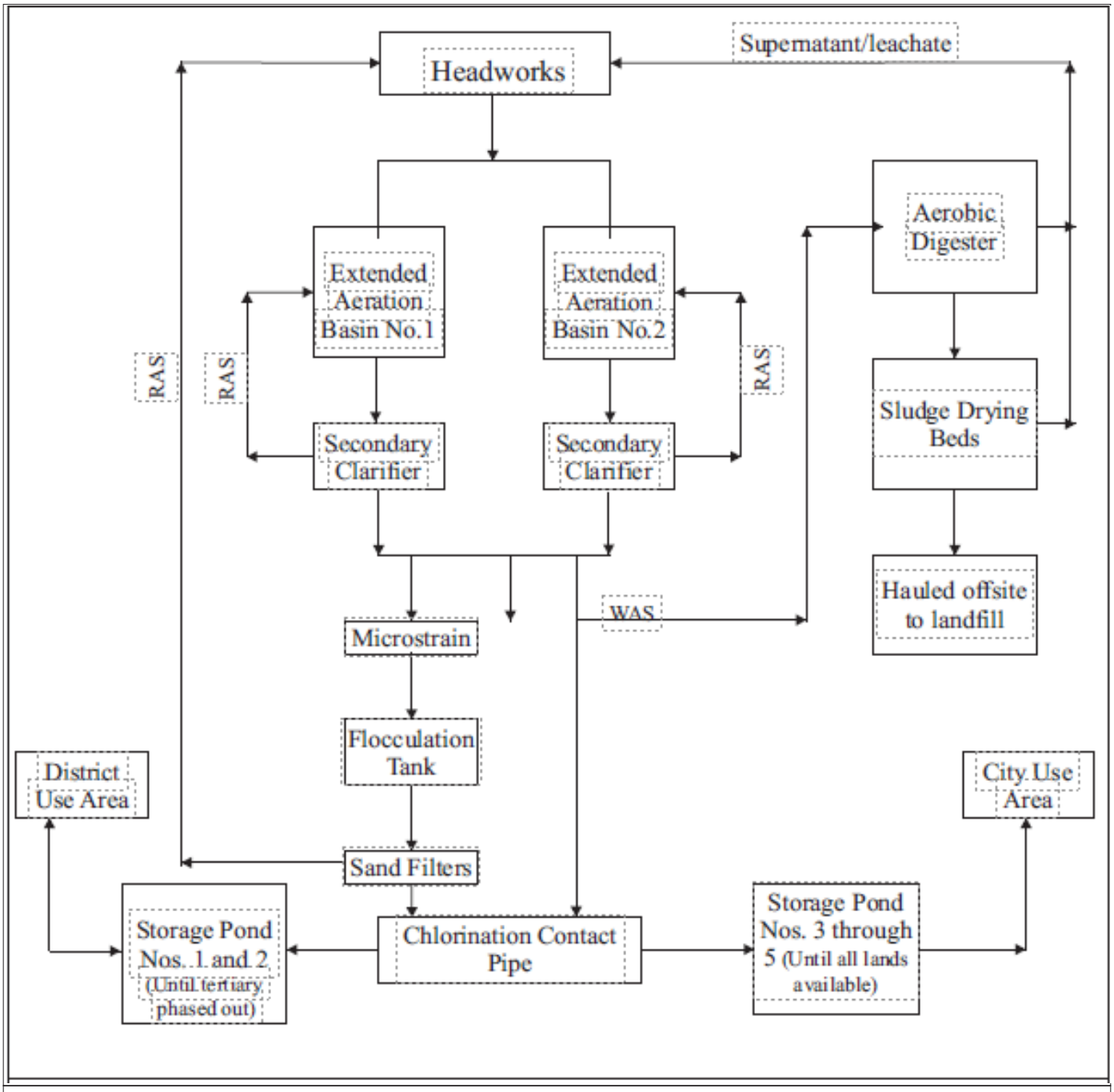
ATTACHMENT B

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2004-0008

PLAN VIEW - WWTF

CITY OF ORANGE COVE
WASTEWATER TREATMENT FACILITY
FRESNO COUNTY

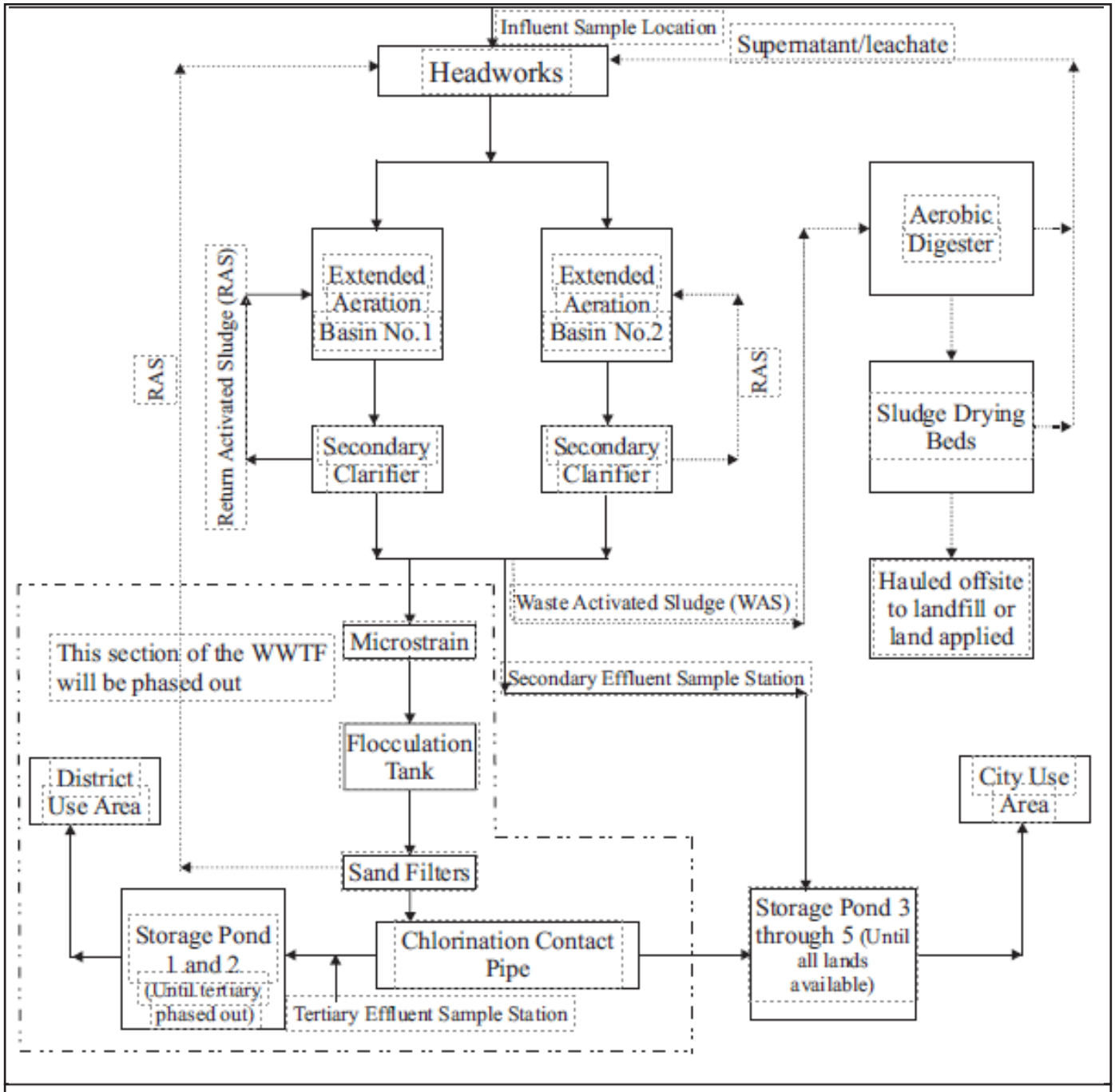
Portions of above figure taken From Kennedy/Jenks Consultants February 2003 RWD



ATTACHMENT C
WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2004-0008

FLOW DIAGRAM

CITY OF ORANGE COVE
WASTEWATER TREATMENT FACILITY
FRESNO COUNTY

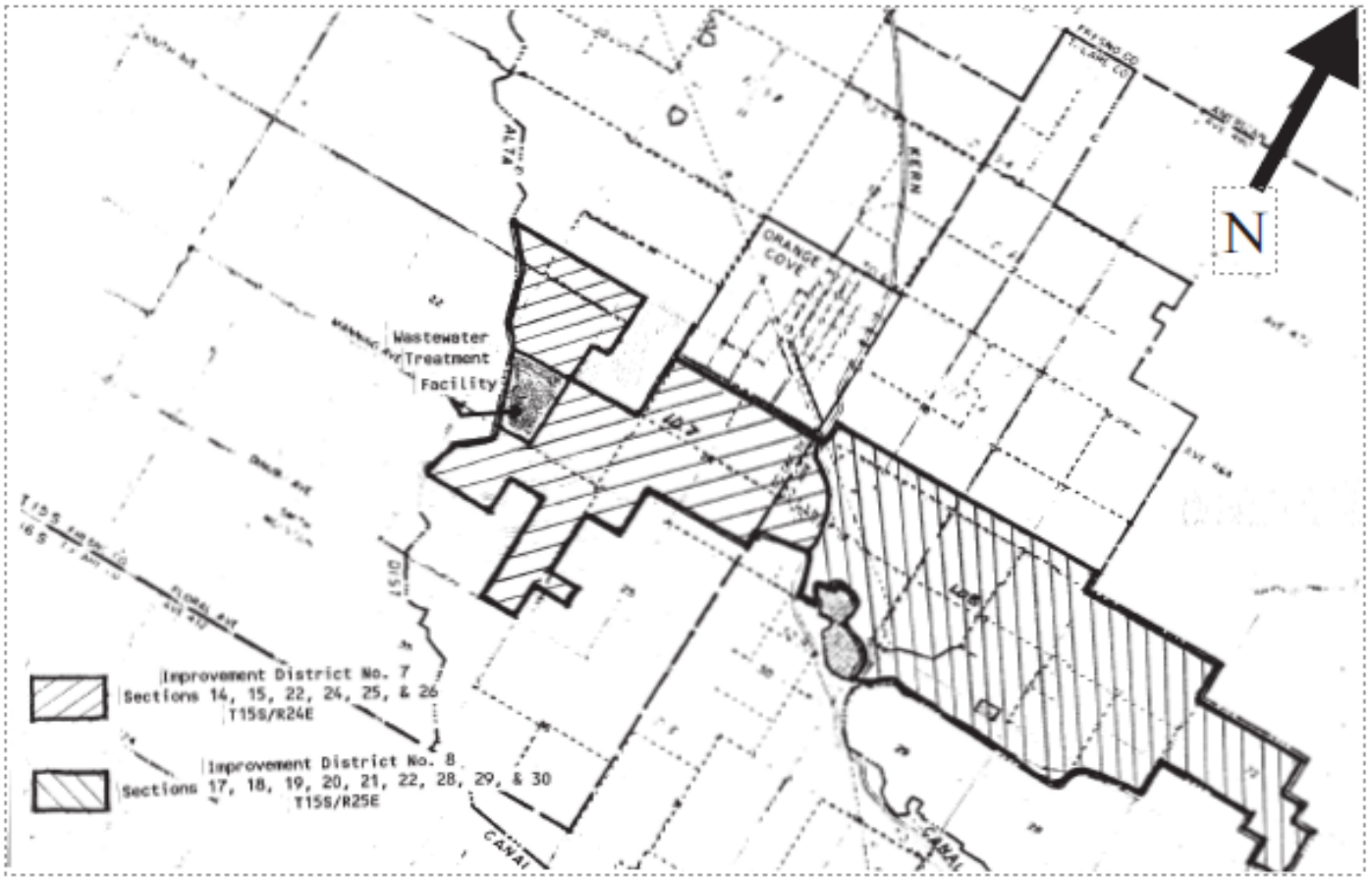


ATTACHMENT D
WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2004-0008

FLOW DIAGRAM - EXPANSION PROJECT

Solids Flow

CITY OF ORANGE COVE
WASTEWATER TREATMENT FACILITY
FRESNO COUNTY



ATTACHMENT E

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2004-0008

VICINITY MAP - IMPROVEMENT DISTRICTS

CITY OF ORANGE COVE
WASTEWATER TREATMENT FACILITY
FRESNO COUNTY

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2004-0008
FOR
CITY OF ORANGE COVE
WASTEWATER TREATMENT FACILITY
FRESNO COUNTY

ATTACHMENT F
STANDARD MONITORING WELL PROVISIONS
For Waste Discharge Requirements

Prior to installation of groundwater monitoring wells, the Discharger shall submit a workplan containing at least the information specified in this document. Wells may be installed after the Executive Officer's approval of the work plan. Upon installation of the monitoring wells, the Discharger shall submit a report of results, as described below. A registered geologist, certified engineering geologist, or civil engineer registered or certified by the State of California must sign all workplans and reports.

Monitoring Well Installation Workplan

A. General Information:
   - Monitoring well locations and rationale
   - Survey details
   - Equipment decontamination procedures
   - Health and safety plan
   - Topographic map showing any existing monitoring wells, proposed wells, waste handling facilities, utilities, and other major physical and man-made features.

B. Drilling Details: describe drilling and logging methods

C. Monitoring Well Design:

Casing diameter	Type of well cap
Borehole diameter	Size of perforations and rationale
Depth of surface seal	Grain size of sand pack and rationale
Well construction materials	Thickness and position of bentonite seal and sand pack
Diagram of well construction	Depth of well, length and position of perforated interval

D. Well Development:
   - Method of development to be used
   - Method of determining when development is complete
   - Method of development water disposal

E. Surveying Details: discuss how each well will be surveyed to a common reference point

F. Soil Sampling (if applicable):

Cuttings disposal method	Number of soil samples and rationale
Analyses to be run and methods	Location of soil samples and rationale
Sample collection and preservation method	QA/QC procedures
Intervals at which soil samples are to be collected	

G. Well Sampling:

Minimum time after development before sampling (48 hours)
Well purging method and amount of purge water
Sample collection and preservation method
QA/QC procedures

H. Water Level Measurement:

The reference point and ground surface elevations at each monitoring well shall be determined within 0.01 foot. Method and time of water level measurement shall be specified.

I. Proposed time schedule for work.

Monitoring Well Installation Report of Results

A. Well Construction:

Number and depth of wells drilled
Date(s) wells drilled
Description of drilling and construction
Approximate locations relative to WWTF and discharge area(s)
A well construction diagram for each well containing the following details:

Monitoring well number	Depth to top of bentonite seal[1]
Location	Thickness of bentonite seal
Date drilled	Thickness of concrete grout
Total depth drilled[1]	Boring diameter
Depth of open hole[1, 2]	Casing diameter
Footage of hole collapsed	Casing material
Length of slotted casing installed	Size of perforations
Depth of bottom of casing[1]	Well elevation at top of casing
Depth to top of sand pack[1]	Date of water level measurement
Number of bags of sand	Depth to which water was first found[1]
Thickness of sand pack	Depth to which water was found after perforating[1]

[1] From ground surface
[2] Same as total depth if no caving appears

B. Well Development:

Date(s) of development of each well
Method of development
Volume of water purged from well
How well development completion was determined
Method of effluent disposal
Field notes from well development should be included in report

C. Well Surveying: provide for each well

Reference elevation (feet above mean sea level to within 0.01 foot)
Ground surface elevation (feet above mean sea level to within 0.01 foot)
Horizontal geodetic location, where the point of beginning shall be described by the California State Plane Coordinate System, 1983 datum
Surveyor's notes

D. Water Sampling:

Date(s) of sampling
How well was purged
How many well volumes purged
Levels of temperature, EC, and pH at stabilization
Sample collection, handling, and preservation methods
Sample identification
Analytical methods used
Laboratory analytical data sheets
Water level elevation(s)
Groundwater contour map

E. Soil Sampling (if applicable):

Date(s) of sampling
Sample collection, handling, and preservation method
Sample identification
Analytical methods used
Laboratory analytical data sheets

4 April 2002

ATTACHMENT G

Recycled Water Sign Symbol

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2004-0008

CITY OF ORANGE COVE

WASTEWATER TREATMENT FACILITY

FRESNO COUNTY

WASTE DISCHARGE REQUIREMENTS NO. R5-2004-0008
FOR
CITY OF ORANGE COVE
FRESNO COUNTY
ATTACHMENT H

WWTF - CITY USE AREA
Recycled Water Monitoring Data For Year: _____
Parcel No. _____ of _____ acres

		Water application				Nitrogen application		
		Water required	Effluent used	Other water used	Total irrigation water	As fertilizer	As effluent*	Total nitrogen applied
Month	Crop	(AF)	(AF)	(AF)	(AF)	(lbs/acre)	(lbs/acre)	(lbs/acre)
October								
November								
December								
Subtotal:								
January								
February								
March								
Subtotal:								
April								
May								
June								
Subtotal:								
July								
August								
September								
Subtotal:								
Annual Total:								

* calculated as (AF effluent/acre) x (2.72) x (X mg/l total nitrogen) = lbs nitrogen/acre

Additional Comments:

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprsonment.

Submitted By: _____

(Signature and Date)