CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

ORDER NO. R5-2002-0198

WASTE DISCHARGE REQUIREMENTS
FOR
CITY OF WASCO
WASTEWATER TREATMENT FACILITY
KERN COUNTY

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

1. The City of Wasco (hereafter City or Discharger) owns and operates a wastewater treatment facility (WWTF) that provides sewerage service for industry and about 19,000 residents and currently has a design treatment capacity of 3.0 million gallons per day (mgd) and a disposal capacity of about 2.9 mgd. The WWTF is at 5410 7th Street, about 1.5 miles west of the City of Wasco, in Sections 9, 16, and 17, T27S, R24E, MDB&M, as shown on Attachment A, a part of this Order.

2. Waste Discharge Requirements (WDRs) Order No. 91-230, adopted by the Regional Board on 22 November 1991 for the Discharger, prescribes requirements for a daily discharge flow of 1.95 mgd and include water recycling requirements. In 1991, the WWTF consisted of two comminutors, a grit chamber, two primary clarifiers, two trickling filters, two secondary clarifier ponds, a 30-acre effluent storage reservoir, 160 acres of shallow disposal ponds used for contingency storage, and about 450 acres of farmland on which effluent is recycled.

3. The Discharger submitted a Report of Waste Discharge (RWD), dated 31 October 1997, in support of an increase in discharge flow from an expanded WWTF (described in Finding No. 8). In absence of revised WDRs, and as allowed by section 13264a(2)(B) of the California Water Code, the Discharger initiated the expansion as proposed in the 31 October 1997 RWD, and certified completion in July 1999.

4. Order No. 91-230 is subject to and due for periodic review and does not reflect the current WWTF. The purpose of this Order is to update waste discharge requirements, in part, to ensure the discharge is consistent with water quality plans and policies, prescribe the requirements that are effective in protecting existing and potential beneficial uses of receiving waters, and reflect the expanded WWTF and its increased discharge flow.

5. The City's Significant Industrial Users include CERTIS, Inc., a producer of agricultural biological pest control products. CERTIS adjusts the pH of its wastewater, as necessary, and monitors discharge flow, pH and and BOD_5. CERTIS reportedly uses no toxic chemicals in the manufacture of its products and generates no toxic byproducts.

6. The City's sewer collection system includes about 56 miles of pipes and one pump station. Collection system components were installed as early as 1935 and as recently as 2001. The sewer system is reportedly in excellent condition and required no major repairs in recent years.

7. Self-monitoring reports from 2001 to 2002 indicate that winter flows are not higher than summer flows, demonstrating insignificant inflow and infiltration to the collection system during winter months.

8. The expanded WWTF consists of headworks with one mechanical bar screen and a flow meter, aerated grit chamber, two primary clarifiers, two plastic media trickling filters, two final clarifiers, two smaller bentonite-lined aerated ponds and one large (25 acre) unlined storage pond, three anaerobic sludge digesters, four unlined sludge drying beds, three 15-acre effluent disposal ponds and an 115-acre disposal pond, which is situated on 160 acres of City-owned land referred to as the "Desert Area." The WWTF also has a septage receiving station and a laboratory, which has not been State certified. Effluent is recycled on the 450-acre City-owned farmland (hereafter Use Area), as shown on Attachment A. The WWTF flow diagram is depicted in Attachment B, a part of this Order. The Discharger currently recycles on only 390 acres of its 450-acre Use Area. At 3.0 mgd, the area irrigated with recycled water will increase to 445 acres by adding 55 acres of alfalfa that is irrigated with fresh water.

9. The WWTF's three storage ponds (one unlined) and four disposal ponds provide about 450 ac-ft (ac-ft) of storage capacity according to the Discharger's *Irrigation Management Plan, July 2000* (IMP). At 3.0 mgd discharge rate, the storage requirement is 457 ac-ft. The WWTF discharge rate, therefore, is limited by the available storage capacity, which is about 98 percent of the storage requirement, or 2.9 mgd.

10. Self-monitoring data from February 2001 to January 2002 characterize the discharge as follows:

Constituent / Parameter	Units	Influent	Effluent	% Removal
Monthly Average Daily Flow	mgd	1.8	1.8	N/A
Settleable Solids	mL/L	17	Trace	99+
BOD_5[1]	mg/L	214	29	86
EC[2]	µmhos/cm	N/A	644	N/A
Total Nitrogen (Nitrate and TKN[3])			14	

[1] 5-day, 20°C biochemical oxygen demand
[2] Conductivity at 25°C
[3] Total Kjeldahl Nitrogen

11. The City obtains its source water from wells. Source water quality is considered high quality, and is characterized as:

Constituent / Parameter	Units	Value[1]
EC	µmhos/cm	316
Total Dissolved Solids (TDS)	mg/L	210
Sodium	mg/L	31
Chloride	mg/L	13
Nitrate **(as N)**	mg/L	6.9

[1] Results of sampling six active wells on 4 October 2001

12. On average, the EC of WWTF effluent is about 330 μmhos/cm higher than source water EC.

13. The Discharger currently dewaters sludge in unlined sludge drying beds and stockpiles dried sludge (biosolids) on-site in an unlined area. Because the drying beds are unlined, sludge liquids have the potential to percolate through the underlying soil to groundwater. In the past, the Discharger has disposed of its biosolids in the Use Area but has not disposed of biosolids for at least the past four years. The Discharger proposes to continue discharging biosolids to its Use Area at a rate of about 30 tons/year (dry weight).

14. The Discharger is not required to obtain coverage under a National Pollutant Discharge Elimination System general industrial storm water permit for the WWTF because all storm water runoff is diverted into existing storm water retention basins, kept separate from the wastewater stream, and does not discharge to a water of the United States.

Recycling

15. 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 statewide responsibility for protecting public health, has established statewide criteria in Title 22, California Code of Regulations (CCR), section 60301 et seq., (hereafter Title 22) for the use of recycled water and has developed guidelines for specific uses. Revisions of the water recycling criteria in Title 22 became effective on 2 December 2000. The revised Title 22 expands the range of allowable uses of recycled water, establishes criteria for these uses, and clarifies some of the ambiguity contained in the previous regulations.

16. The 1988 Memorandum of Agreement (MOA) between DHS and the State Water Resources Control Board (SWRCB) 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.

17. Title 22 section 60323 requires recyclers of treated municipal wastewater to submit an engineering report detailing the use of recycled water, contingency plans, and safeguards. The Discharger had not submitted an engineering report to DHS pursuant to Title 22, section 60323, for its water recycling operations on its 450-acre Use Area. Regional Board letter dated 3 December 2001 requested the Discharger to submit a Title 22 engineering report by 5 March 2002. The Discharger submitted the report on 1 August 2002. Regional Board letter dated 30 August 2002 notified the Discharger that the Title 22 engineering report required additional information to be deemed complete and requested the Discharger submit a revised report by 15 October 2002.

18. Title 22 section 60304(d) allows for the use of undisinfected secondary recycled water for prescribed applications involving certain food and seed crops, subject to various restrictions. Because undisinfected secondary recycled water would represent a potential public health threat if food or seed crops were directly or indirectly exposed to the undisinfected recycled water, it is imperative

that the restrictions outlined with the identified uses under section 60304(d) are strictly complied with. If a recycler cannot provide the necessary assurances that applicable restrictions can be complied with at all times, it is appropriate for the Regional Board to either require a higher level of treatment (i.e., disinfection) or restrict applications of undisinfected secondary recycled water to crops not intended for human consumption (e.g., fodder and fiber crops) and food crops that undergo commercial pathogenic destroying processing.

19. The Use Area is planted in alfalfa, corn, cotton, blackeye beans, and sugar beets. As described in Finding No. 18, it is appropriate to restrict the Use Area to fodder and fiber crops, and crops that undergo pathogen-destroying processing (e.g., sugar beets). Blackeye beans may be a food crop for human consumption. Regional Board letter dated 17 December 2001 requested the Discharger certify its compliance with Title 22 regarding the processing of blackeye beans irrigated with recycled water. In its review of the certification submitted 3 July 2002, DHS indicated by letter dated 9 July 2002 that the certification alone was insufficient to ensure that the crop would not be used for human consumption. DHS further indicated that the Title 22 requirements would be satisfied if the crop use is clearly described in the Title 22 engineering report and included as a provision in the WDRs.

20. Annual nitrogen uptake rates by the Use Area crops are:

Crop Type	Nitrogen Uptake, lbs/ac/yr
Alfalfa	480[1]
Corn	250[1]
Cotton	180[1]
Blackeye Beans	100[2]
Sugar Beets	255[1]

[1] Western Fertilizer Handbook

[2] According to Discharger's July 2000 Irrigation Management Plan

21. According to the Discharger's *Irrigation Management Plan, July 2000* (IMP), at the current maximum permitted capacity of 1.95 mgd, the hydraulic load to the existing Use Area is about 1,500 ac-ft/year. At 3.0 mgd, the hydraulic load to the expanded Use Area will be about 1,800 ac-ft/year. The average hydraulic unit loading in both cases is 4.15 ac-ft/acre/year. The average total nitrogen concentration of the effluent is 14 mg/L. Using this concentration, the nitrogen loading is about 158 lbs/acre/year for both the current Use Area and the expanded Use Area.

Hydrology, Soils, and Land Use

22. The WWTF and Use Area lie within the Tulare Lake Basin, specifically the North Kern Hydrologic Area (No. 558.80) of the South Valley Floor Hydrologic Unit (No. 558), as depicted on interagency hydrologic maps prepared by the California Department of Water Resources (DWR) in Spring 1986. Surface water drainage in the area is by sheet flow to natural or manmade drainageways then to the valley floor or Tulare Lake as there is no recognized surface water close by the WWTF. The WWTF and Use Area are not within a 100-year floodplain.

23. 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 5.7 inches and 52.1 inches, respectively, according to information published by DWR.

24. Areal soils consist of Wasco sandy loam, Graces silt loam and Kimberlina fine sandy loam according to the U.S. Soil Conservation Service. Intermixed with these soil types may be small areas of Panoche clay loam, Milham sandy loam and Cajon sandy loam. These soils are deep and well drained. Runoff is slow and permeability ranges from very slow to moderately rapid.

25. Areal groundwater is approximately 200 feet below ground surface (bgs) and flows northwesterly, according to information in *Lines of Equal Elevation of Water in Wells in Unconfined Aquifer*, published by DWR in Spring 1997. This uppermost groundwater layer is separated from the remainder of the aquifer by a confining clay layer at about 300 feet bgs, according to supplemental data dated 18 July 2001 to the Discharger's *Revised Groundwater Assessment Report, April 2001.* Public water supply wells in the City of Wasco and at the nearby Wasco State Prison extract groundwater only from the lower aquifer. Some of the irrigation wells within one mile of the WWTF have screen intervals that straddle the two aquifers, and one domestic well and four irrigation wells primarily extract from the upper aquifer, but the vast majority of the wells primarily extract from the lower aquifer.

26. The Discharger installed three monitoring wells in the Use Area in June 1999 and proposes to install three additional wells to complete the groundwater monitoring well network. However, it only sampled the groundwater immediately after installing the three wells and a second time about six months later. Order No. 91-230 requires the Discharger to conduct monthly sampling of the groundwater from these wells for 12 consecutive months after installation. The Discharger did not comply with this requirement. After being reminded of this requirement by letter dated 17 December 2001, the Discharger initiated the sampling in January 2002 and will collect two samples monthly to shorten the sampling period from 12 months to six months. After reviewing data from the 12 samples, the Discharger will install the three additional wells to complete the groundwater monitoring well network.

27. Because groundwater data from the Discharger's monitoring wells consists of only four samples from each well, characterization of the quality of groundwater influenced by the WWTF and discharge is premature. However, the limited data provide preliminary indications of groundwater

conditions. Groundwater in the WWTF and Use Area vicinity occurs at much shallower depth below ground surface than the regional groundwater. Since treated wastewater is stored in unlined ponds, percolating effluent may have caused a mounding effect on the groundwater table. Average values for constituents from four rounds of groundwater sampling are:

Constituent	Units	MW-1	MW-2	MW-3
Depth to groundwater	feet bgs	85	75	56
Nitrate-Nitrogen	mg/L	4.7	3.1	6.9
Total Nitrogen	mg/L	6.4	4.1	8.1
EC	µmhos/cm	808	590	904
Total Dissolved Solids	mg/L	510	374	603
Calcium	mg/L	107	58	73
Chloride	mg/L	33	38	51
Sodium	mg/L	63	62	132
Boron	mg/L	0.15	<0.10	0.21

28. The current volume of effluent percolating to groundwater is estimated to be 128 ac-ft/year based on information presented in the IMP (i.e., 28 acres storage pond total area and 0.15 inch/day percolation rate). At 3.0 mgd, effluent will be pumped to the "Desert Area" disposal pond for storage or disposal. When the disposal pond is used, the effluent volume percolating to groundwater is estimated to be 655 ac-ft/year.

29. Land use in the WWTF vicinity is primarily agricultural but includes the Wasco State Prison, a golf course and a cemetery. Crops grown within one-mile of the WWTF include cotton, corn, sugar beets, beans (dry), artichokes, carrots, green beens, onions, tomatoes, flowers, alfalfa, grain crops, almonds, walnuts, pistacios, and oranges according to DWR land use data published in 1998. Most crops in this area are flood irrigated, although others are sprinkler, micro-sprinkler, and drip irrigated, according to the University of California Cooperative Extension.

30. The Wasco State Prison is directly west of the WWTF and occupies almost all of Section 8, T27S, R24E, MDB&M, as shown on Attachment A. The prison is surrounded by its own WWTF to the south and use area to the west and north. WDRs Order No. 90-217 regulates the prison's WWTF and its discharge to land. The prison treated about 278 million gallons (853 ac-ft) of wastewater in 2001 (0.76 mgd), according to its 2001 annual report, and applied about 1,000 ac-ft of effluent and 600 ac-ft of fresh water on 296 acres of alfalfa. The nitrogen content in the prison WWTF effluent is about 18 mg/L. Total nitrogen from wastewater applied to the crops is 169 lbs/ac/yr. An additional 200 tons of biosolids with a total nitrogen concentration of 3,700 mg/kg (1480 lbs of nitrogen) were applied to crops and non-farmed areas. Highest nitrogen loading from wastewater and biosolids is about 243 lbs/ac/yr on about 10 acres of crop, much less than the nitrogen uptake rate of 480 lbs/ac/yr for alfalfa indicated in Finding No. 20. Order No. 90-217 does not require groundwater monitoring. Therefore, there is insufficient data to determine the impact on groundwater of the combined discharges from the prison and the City of Wasco.

31. 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. As indicated in Finding No. 25, all of the public water supply wells and most of the irrigation supply wells extract groundwater from below the uppermost layer.

32. Percolated effluent and agricultural leachate accumulate on and in the uppermost layer of the uppermost aquifer until dispersed horizontally and vertically into the main mass of the aquifer. The amount of water recharging groundwater per unit area and the local hydrogeology dictate the general character of the plume. Irrigated agriculture, with relatively low and seasonal rates, is generally dispersed near the groundwater surface. The discharge, by virtue of discharge rate, volume, and duration, 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 (e.g., chloride). 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.

Beneficial Uses and Water Quality Objectives

33. *Water Quality Control Plan for the Tulare Lake Basin*, *Second Edition),* (hereafter Basin Plan) designates beneficial uses, establishes water quality objectives, and contains implementation programs and policies to achieve water quality objectives for all waters of the Basin. The Basin Plan incorporates plans and policies of the State Board by reference, including State Board Resolution No. 68-16 (hereafter Resolution 68-16 or the "Antidegradation" Policy) and Resolution No. 92-49, Policies and Procedures for Investigation and Cleanup and Abatement of Discharges Under Water Code Section 13304.

34. The Basin Plan requires municipal WWTFs that discharge to land comply with treatment performance standards for BOD_5 and TSS. WWTFs that preclude public access and discharge one 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. WWTFs that discharge less than one mgd must provide reduction to 40 mg/L of both BOD_5 and TSS.

35. 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 reclamation on irrigated crops wherever feasible and indicates that discharges to surface water and evaporation of reclaimable wastewater will not be acceptable permanent disposal methods where the opportunity exists to replace an existing use or proposed use of fresh water with recycled water. Where appropriate, the Basin Plan allows a timetable for implementing reclamation. The City's discharge constitutes a significant source of agricultural supply water and groundwater recharge.

36. The Basin Plan identifies the greatest long-term problem facing the entire Tulare Lake Basin as the increase in salinity in groundwater, which has accelerated due to the intensive use of soil and water resources by irrigated agriculture. The Basin Plan describes numerous salt management recommendations and requirements. The latter includes the requirement that discharge to land from wastewater treatment facilities not contain an EC greater than source water plus a maximum 500 µmhos/cm, or less if necessary to achieve water quality objectives. Accordingly, the Basin Plan allows for salinity degradation and focuses on controlling the rate of increase.

37. Existing or potential beneficial uses of surface waters identified in the Basin Plan for Valley Floor Waters are agricultural supply, industrial service supply, industrial process supply, water contact recreation, noncontact water recreation, warm freshwater habitat, wildllife habitat, rare, threatened, or endangered species, and groundwater recharge.

38. The WWTF is in Detailed Analysis Unit (DAU) No. 256 of the South Valley Floor Hydrologic Unit. 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.

39. The Basin Plan establishes numeric and narrative water quality objectives for surface waters and groundwater within the basin. Numeric water quality objectives are limits already quantified. Narrative water quality objectives are unquantified limits expressing the level of protection for beneficial uses from specific waste constituents and categories of waste constituents. Objectives for chemical constituents in, and toxicity and tastes and odors of, groundwater take both forms. 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 that groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use.

40. Pursuant to sections 13263(a) and 13377 of the CWC, waste discharge requirements must implement the Basin Plan and consider the beneficial uses and water quality objectives reasonably required to protect the uses, the need to prevent nuisance, as well as other waste discharges and conditions in the area and groundwater. The Basin Plan requires that waste discharge requirements apply all water quality objectives for each constituent to ensure that discharges do not cause groundwater to contain chemical constituents, toxic substances, radionuclides, pesticides, or taste- or odor-producing substances in concentrations that adversely affects any beneficial use or causes nuisance. To satisfy all objectives, the most stringent objective for each constituent must be met.

41. The Basin Plan procedure for applying water quality objectives as terms of discharge in waste discharge requirements requires maintenance of the existing quality of groundwater except where an adverse change is consistent with Resolution 68-16. Resolution 68-16 requires that waste discharges occur in a manner that maintains high quality waters of the State. Any change in quality can only occur after full application of best practicable treatment and control (BPTC) of the waste and must be consistent with maximum benefit to the people of the State, not unreasonably affect any beneficial use, and not result in water that exceeds any water quality objective.

42. State Board Resolution No. 92-49 addresses procedural requirements for investigation as well as cleanup and abatement of unauthorized discharges. A discharger shall be required to conduct step-by-step investigations for this purpose, to submit written workplans and reports for all elements and phases, to conform to the provisions of Resolution 68-16, and to cleanup and abate the effects of the discharge in a manner that promotes attainment of background water quality or the highest water quality that is reasonable and which does not exceed water quality objectives.

43. To protect the designated use of municipal and domestic supply, water quality objectives require, at a minimum, that waters not exceed maximum contaminant levels (MCLs) specified in the following provisions of Title 22, CCR: sections 64431 (Inorganic Chemicals and Fluoride); 64443 (Radioactivity); 64444 (Organic Chemicals); and 64449 (Secondary MCLs – Consumer Acceptance Limits).

44. The Basin Plan's incorporation of MCLs by reference is prospective to incorporate changes to MCLs as changes in Title 22 take effect. Should a change occur to an MCL and that MCL becomes the most stringent objective, implementation of the objective would be affected through reopening of this Order and consideration of a time schedule.

45. The Basin Plan sets forth a procedure for translating narrative water quality objectives into numeric receiving water limits, directing that relevant numeric criteria and guidelines developed and published by other agencies and organizations and any other relevant criteria be considered.

46. Quantifying a narrative water quality objective requires a site-specific evaluation of each waste constituent for consistency with the narrative objective using the procedures set forth in the Basin Plan. These translation procedures require this Board consider, 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*, (hereafter Guidelines) provide detailed information to evaluate the quality of irrigation water necessary to sustain various crops.

47. 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 to water and air.

48. The Guidelines indicate 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 . The Guidlines provide 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 and TDS of less than 450 mg/L. 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.

49. The Guidelines divide water quality characteristics as having "No Problem – Increasing Problems – Severe Problems" based on large numbers of field studies and observations, and carefully controlled greenhouse and small plot research. In general, crops sensitive to sodium or chloride are most sensitive to foliar absorption from sprinkler-applied water. Bicarbonate has been a problem when fruit crops or nursery crops are sprinkler irrigated during periods of very low humidity and high evaporation. The following table contains numerical criteria adapted from the Guidelines for protection of a range of crops under various circumstances, but the most stringent is not necessarily the concentration that assures no adverse affect on any nonagricultural beneficial use:

Problem and Related Constituent	No Problem	Increasing Problem
Salinity of irrigation water (EC, µmhos/cm)	< 700	700 – 3,000
Salinity of irrigation water (TDS, mg/L)	< 450	450 – 2,000
Specific Ion Toxicity		
from ROOT absorption		
Sodium (mg/L)	< 69	69 – 207
Chloride (mg/L)	< 142	142 – 355
Boron (mg/L)	< 0.7	0.7 – 3.0
from FOLIAR absorption		
Sodium (mg/L)	< 69	> 69
Chloride (mg/L)	< 106	> 106
Miscellaneous		
NO_3-N plus NH_4-N and Organic-N (mg/L) (for susceptible crops)	< 5	5 – 30
HCO_3 (mg/L) (only with overhead sprinklers)	< 90	90 - 520
pH (for susceptible crops)	normal range = 6.5 – 8.4	

50. 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. To protect both existing and probable future agricultural uses, limits are set to protect all crops that have the potential to be grown in the area.

51. The Guidelines present the maximum EC of irrigation water for various crops with respect to percent crop reductions (i.e., 0, 10, 25, and 50). Zero crop yield reductions are expected when irrigating all crops grown in the WWTF vicinity with water having an EC of less than 1,000 µmhos/cm, with the exception of beans, carrots, and onions. Irrigation water EC data (in µmhos/cm) for crops cultivated in the WWTF vicinity (as described in Finding No. 29) are:

Crop	0% Reduction	10% Reduction
Beans	700	1,000
Carrots	700	1,100
Onions	800	1,200
Almonds	1,000	1,400
Oranges	1,100	1,600
Corn (Sweet)	1,100	1,700
Corn (Forage)	1,200	2,100
Alfalfa	1,300	2,200
Tomatoes	1,700	2,300
Hay (Barley)	4,000	4,900
Cotton	5,100	6,400

52. With respect to specific-ion toxicity, the Guidelines 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., onions, oranges). Similarly, reductions in yields of sodium- and chloride-sensitive crops are evident when sprinkler irrigated with water containing sodium and chloride concentrations of up to 3 milliequivalents per liter (me/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.

53. The list of crops in Finding No. 29 is not intended as a definitive inventory of crops that are or could be grown in the area affected by the discharge. Based on climate, soil type, and natural background water quality, other crops sensitive to salt and boron may be capable of being grown in the area, and changing market conditions could drive a change in cropping patterns, but neither is expected to necessitate greater protection than crops already identified.

54. Water quality objectives are necessary to maintain the existing and anticipated beneficial uses of area groundwater for the production of area crops, including those sensitive to salt (i.e., sodium and chloride), boron, or both. The numerical values reflect the highest tolerable level of constituents and parameters necessary to sustain sprinkler application, as these are more restrictive than for flood irrigation. These limits include EC (700 µmhos/cm), and the following expressed as mg/L: boron (0.7) chloride (106), sodium (69), and TDS (450). A limit of 10 mg/L for total nitrogen is appropriate because all forms of nitrogen can convert to nitrate in groundwater and the nitrate primary MCL is 10 mg/L as nitrogen. Nitrogen is a beneficial nutrient for crops and 10 mg/L is adequately protective of nitrogen-sensitive agricultural land uses (e.g., livestock watering).

55. In addition to the water quality objectives necessary to maintain the existing and probable future beneficial uses of area groundwater for municipal and domestic supply (Finding No. 73), another

water quality objective concerns taste- or odor-producing substances in concentrations that adversely affects any beneficial use or causes nuisance. The discharge contains ammonia, 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 United Kingdom (UK) has prescribed a drinking water limit based on taste and odor for ammonium (ammonia and ammonium ions as NH_4) of 0.5 mg/L (UK's Water Supply (Water Quality) Regulations 1989 (as amended...) for England and Wales). While the UK 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 receiving water limitation for ammonium (ammonia and ammonium ions as NH_4) of 0.5 mg/L for this location to protect beneficial use of area groundwater for human consumption.

56. Using the translation procedures in the Basin Plan for deriving numerical limitations from narrative water quality objectives, the most stringent groundwater limits at this location for EC and TDS are 700 µmhos/cm and 450 mg/L, respectively.

57. Water quality limits applicable to this location are developed as above for ammonium (ammonia and ammonium ions as NH_4), boron, chloride, EC, nitrogen, and TDS (i.e., 0.5 mg/L, 0.7 mg/L, 106 mg/L, 700 µmhos/cm, 10 mg/L, and 450 mg/L, respectively).

58. Groundwater monitoring data to date (Finding No. 27) indicate chloride and boron levels are below the tolerance levels of the area's chloride and boron sensitive crops. However, EC in one monitoring well is above the level recommended for salt sensitive crops. It is premature to determine whether groundwater, as impacted by the discharge, no longer supports growing of the most salt sensitive crops (e.g., beans, carrots, onions).

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 the 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 ore more of these constituents in groundwater. Any increase in the concentration of these constituents in groundwater as the result of waste discharge 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, section 20005 et seq. (hereafter Title 27). The exemption, pursuant to section 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 plant.

62. Excessive residual organic carbon in percolating effluent and/or sludge leachate may result in prolonged periods of oxygen deficiency and reducing conditions in groundwater. If effluent and/or sludge leachate 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 the WWTF will likely become anoxic and reducing. 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 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 prohibited. Some degradation of groundwater by the discharge 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 measures;

    c. minimized by fully implementing, regularly maintaining, and optimally operating best practicable treatment and control (BPTC) measures; and

    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 industrial discharge compared to the benefits;

c. environmental aspects of the discharge; and

d. the implementation of feasible alternative treatment or control methods.

65. The WWTF described in Finding No. 8 incorporates the following BPTC measures:

a. technology for secondary treatment of municipal wastewater;

b. concrete treatment structures;

c. recycling of effluent on agricultural crops at or below agronomic rates;

d. biosolids reuse;

e. effective salinity source control;

f. a capital recovery fund;

g. an up-to-date operation and maintenance manual;

h. staffing to assure proper operation and maintenance.

66. The Information Sheet describes certain aspects of the Discharger's waste treatment and control practices that have not been and are unlikely to be justified as representative of BPTC. These include unlined sludge drying beds, excessive stockpiling of biosolids, and no approved groundwater monitoring well network. Deficiencies in treatment and control that cause or contribute to exceedances of Basin Plan numerical water quality objectives will never be acceptable and will subject the Discharger to enforcement.

67. This Order establishes schedules of tasks to (1) evaluate BPTC for each major treatment, storage, and disposal component of the WWTF and (2) characterize groundwater for waste constituents specified in this Order's Monitoring and Reporting Program (MRP).

68. This Order is the first of a two-phase approach to ensure long-term discharge is consistent with Regional Board plans and policies. It is appropriate for the Discharger to assume responsibility for assembling the necessary information for the Regional Board to determine consistency with its plans and policies. During Phase 1, the Discharger:

a. Implements an effective groundwater monitoring program that characterizes the discharge's affect on water quality and beneficial uses and evaluates background water quality.

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

i. identify less than optimum treatment or control practices, and

ii. ensure full implementation of BPTC and provide optimal operation and maintenance.

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

69. Following the completion of Phase 1 tasks, the evidence submitted by the Discharger will be evaluated and this Order 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 all applicable water quality objectives for that waste constituent, including the most stringent objective.

70. Until the work required in Phase 1 is completed by the Discharger and reviewed, it is reasonable that interim receiving water limitations directly implement Basin Plan water quality objectives and prohibit further degradation than has already been caused by the discharge. 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 section 13241, including economics, is unnecessary for this purpose. As interim groundwater limitations during Phase 1, the 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 in the second phase. Accordingly, the discharge is consistent with the antidegradation provisions of Resolution 68-16.

CEQA

71. On 14 January 1998, the Kern County Community Development Program Department certified a Mitigated Negative Declaration (MND) for the WWTF expansion, in accordance with the California Environmental Quality Act (CEQA) (Public Resources Code section 21000 et seq.) and the State CEQA Guidelines (Title 14, Division 6, California Code of Regulations, as amended).

72. Review of the MND and the supporting Environmental Assessment/Initial Study Findings and Determination for the project indicates the significant adverse effects on groundwater may result from use of unlined sludge drying beds. Provision G.8 requires the Discharger modify its sludge handling operations to be protective of groundwater quality.

General Findings

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

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

> In conducting an investigation specified in 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 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 the waters of the state within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the board requires. The burden, including costs of these reports, shall bear a reasonable relationship to the need for the reports 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.

75. The monitoring and reporting program required by this Order and the attached Monitoring and Reporting Program No. R5-2002-0198 are necessary to assure compliance with these waste discharge requirements. The Discharger operates the facility that discharges the waste subject to this Order.

76. 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.

77. The Discharger and interested agencies and persons have been notified of the intent to prescribe waste discharge requirements for this discharge and provided with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.

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

IT IS HEREBY ORDERED that Waste Discharge Requirements Order No. 91-230 is rescinded and that, pursuant to CWC sections 13263 and 13267, City of Wasco, its agents, successors, and assigns, in order to meet the provisions contained in Division 7 of the CWC and regulations adopted thereunder, shall comply with the following:

A. Discharge Prohibitions

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

2. Discharge of waste classified as 'hazardous,' as defined in section 2521(a) of Title 23, CCR, section 2510 et seq., is prohibited. **Discharge of waste classifiable as 'designated,' as defined in CWC, § 13173, in a manner that causes violation of groundwater limitations, 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 Regional Board-adopted water recycling requirements or waiver of said requirements is prohibited.

5. Cross-connection between any potable water supply and piping containing recycled water is 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. Discharge Specifications

1. **Until Provision G.9 is satisfied**, **the monthly average daily dry weather** discharge flow shall not exceed **1.95** mgd.

2. **After Provision G.9 is satisfied**, **the monthly average daily dry weather** discharge flow shall not exceed **3.0** mgd.

3. The monthly average EC of the discharge shall not exceed the flow-weighted average EC of the source water plus **500** µmhos/cm, or a total of **900** µmhos/cm, whichever is less. The flow-weighted average for the source water shall be a moving average for the most recent twelve months.

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

5. The discharge shall not exceed the following limits:

Constituent	Units	Monthly Average[1]	Daily Maximum
Settleable Solids	mL/L	**0.2**	**0.5**
BOD_5	mg/L	**40**	**80**
TSS	mg/L	**40**	**80**

[1] Average value for all samples collected within a calendar month.

6. The arithmetic mean of BOD_5 and of total suspended solids in effluent samples collected over a monthly period shall not exceed **20** percent of the arithemtic mean of the values for influent samples collected at approximately the same times during the same period (**80** percent removal).

7. Objectionable odors originating at the **WWTF** shall not be perceivable beyond the limits of the WWTF and the effluent storage and disposal 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 the **storage and disposal ponds** shall not be less than **1** mg/L.

9. The **storage and disposal 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 the **storage and disposal ponds** (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 the **storage and disposal ponds** permanent markers with calibration indicating the water level at design capacity and available operational freeboard. Upon the Discharger's written request, the **storage and disposal 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. The Discharger shall preclude public access to the waste treatment and effluent **storage and disposal ponds** facilities through methods such as fences, signs, or other acceptable means.

14. The **storage and disposal ponds** shall have sufficient capacity to accommodate allowable wastewater flow and design seasonal precipitation and ancillary inflow and infiltration during the winter. Design seasonal precipitation shall be based on total annual precipitation using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns.

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

16. 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. Recycling Specifications

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

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 users of recycled water shall provide for appropriate backflow protection for potable water supplies as specified in Title 17, CCR, section 7604, or as specified by DHS.

3. Recycled water shall remain within the permitted Use Area (as defined in Finding No. 8).

4. Use of recycled water shall be limited to flood irrigation of fodder and fiber crops.

5. Application of wastewater, biosolids, 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 G.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 recycled water:

Setback Distance (feet)	To
25	Property Line
30	Public Roads
50	Drainage courses
100	Irrigation wells
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. All applied irrigation water must infiltrate completely within a 24-hour period.

   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, 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 C and present the following wording:

RECYCLED WATER - DO NOT DRINK

AGUA DE DESPERDICIO RECLAMADA - POR FAVOR NO TOME

D. 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, silviculture, horticulture, and land reclamation activities.

1. Sludge and solid waste shall be removed from screens, sumps, **filters**, 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 of biosolids as a soil amendment shall comply with valid waste discharge requirements issued by a regional water quality control board. In most cases, this will mean General Biosolids Order (SWRCB Water Quality Order No. 2000-10-DWQ, General Waste Discharge Requirements for the Discharge of Biosolids to Land for Use as a Soil Amendment in Agricultural, Silvicultural, Horticultural, and Land Reclamation Activities). For a biosolids use

project to be covered by the General Biosolids Order, the Discharger must file a complete Notice of Intent and receive a Notice of Applicability for each project.

6. Use and disposal of biosolids should 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 (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.

E. 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 which create a fire or explosion hazard in the treatment works;

   b. Wastes which 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 which cause obstruction to flow in sewers, or which cause other interference with proper operation or treatment works;

   d. Any waste, including oxygen demanding pollutants (BOD, etc.), released in such volume or strength as to cause inhibition or disruption in the treatment works, and subsequent treatment process upset and loss of treatment efficiency;

   e. Heat in amounts that inhibit or disrupt biological activity in the treatment works, or that raise influent temperatures above 40°C (104°F), unless the treatment works is designed to accommodate such heat;

   f. Petroleum oil, nonbiodegradable cutting oil, or products of mineral oil origin in amounts that will cause interference or pass through;

   g. Pollutants that result in the presence of toxic gases, vapors, or fumes within the treatment works in a quantity that may cause acute worker health and safety problems; and

   h. Any trucked or hauled pollutants, except at points predesignated by the Discharger.

2. The Discharger shall implement the legal authorities, programs, and controls necessary to ensure that indirect discharges do not introduce pollutants into the sewerage system that, either alone or in conjunction with a discharge or discharges from other sources:

   a. Flow through the system to the receiving water in quantities or concentrations that cause a violation of this Order, or

b. Inhibit or disrupt treatment processes, treatment system operations, or sludge processes, use, or disposal and either cause a violation of this Order or prevent sludge use or disposal in accordance with this Order.

F. 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 any of the limits listed below, unless natural background is greater, in which case the natural background level shall be the limit:

1. Total coliform organisms of 2.2 Most Probable Number/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. Constituents identified in Title 22 (refer to Finding No. 43) — 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.

   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 substances in concentrations that cause nuisance or adversely affect beneficial uses, including but not limited to, ammonium (ammonia and ammonium ions as NH_4) in excess of 0.5 mg/L.

G. 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. R5-2002-0198, that 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, sections 6735, 7835, and 7835.1. To demonstrate compliance with Title 16, CCR, sections 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. By **1 March 2003**, the Discharger shall submit a technical report that contains a characterization of the discharge for constituents identified in Title 22 (as described in Finding No. 43). The report shall describe the sampling program utilized to characterize the discharge and is subject to the requirements in Provision G.4 and Executive Officer approval.

7. By **1 March 2003**, the Discharger shall submit a technical report describing a sludge management plan that satisfies the information requirements of Attachment D *Information Needs For Sludge Management Plan*. The technical report submitted pursuant to this Provision is subject to the requirements in Provision G.4 and Executive Officer approval.

8. The Discharger shall modify its sludge handling operations to comply with Discharge Provision shall be performed in accordance with the following schedule:

Task		Compliance Date
a.	Submit technical report describing modifications necessary and an implementation schedule to achieve compliance with Discharge Specification B.16 and Sludge Specifications D.2 and D.3	**1 May 2003**
b.	Implement work proposed in task a	60 days following completion of task a
c.	Submit status reports on modification work	Every six months following completion of task b
d.	Complete modification work	1000 days following completion of task b

Technical reports submitted pursuant to this Provision shall be subject to the requirements of Provision G.4 and the Executive Officer's approval.

9. By **1 April 2003**, the Discharger shall submit a technical report certifying whether the expanded WWTF is capable of consistently disposing of 3.0 mgd of wastewater in full compliance with the terms and conditions of this Order using accepted treatment and disposal practices. The technical report shall include capacity analysis of all treatment units, including the storage and disposal ponds and the Use Area. The analyses shall include water and nitrogen balance calculations. Water balance calculations shall be based on total annual precipitation in the area using a return period of 100 years, distributed monthly in accordance with historical rainfall patterns, normal evatranspiration and evaporation, and average percolation rate for the soil types in the area. Disposal by recycling on crops must demonstrate that the required capacity can be accomplished with accepted irrigation practices. The report shall include all supporting data, including the source of the data, such as soil types, type of crops grown in the Use Area (e.g., pasture forage), crop water use, and crop nitrogen utilization rates. The technical report submitted pursuant to this Provision is subject to the requirements in Provision G.4 and the Executive Officer's approval.

10. By **1 April 2003**, the Discharger shall submit a technical report describing a Use Area management plan that ensures wastewater, biosolids, and commercial 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 use areas, areas of public access, locations and wording of public warning signs, and setback distances from irrigation and domestic wells, property boundaries, and roads. The report need not include analyses that are duplicative of that required to satisfy Provision G.9. The report need only cite the source of such

data and results. The technical report submitted pursuant to this Provision is subject to the requirements in Provision G.4 and the Executive Officer's approval.

11. **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 for determination of compliance with groundwater limitations and Provision G.5 regarding BPTC implementation.

    Following completion of its hydrogeologic investigation, the Discharger shall submit a technical report describing a proposed modified groundwater monitoring well network. The technical report shall consist of a monitoring well installation work plan that satisfies Attachment E, *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.

    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 section 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, and commence groundwater monitoring in accord with this Order's MRP. 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	**1 May 2003**

Task		Compliance Date
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	90 days following completion of task c
e.	Submit technical report: monitoring well installation report of results	90 days following completion of task d
f.	Report on sampling procedures as described in the MRP	1st day of the second month following the first sampling event
g.	Submit technical report: natural background quality	365 days following completion of task e

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

12. Compliance with groundwater limitations will be evaluated based on data collected from approved groundwater monitoring wells following completion of Provision G.11, task g. Should the Discharger fail to comply with the schedule to characterize natural background groundwater quality at approved monitoring wells by the date specified in Provision G.11, task g, the Regional Board shall not consider the lack of natural background characterization as sufficient defense to enforcement for violations of Groundwater Limitations F.1 and F.2.

13. 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	**1 September 2003**
b.	Commence comprehensive evaluation	**30 days** following Executive Officer approval of task a
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 are subject to the requirements in Provision G.4 and the Executive Officer's approval as to adequacy.

14. **By 1 November 2005**, 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 limit implementing a water quality objective can vary according to land use and other factors, and the Discharger's BPTC cannot assure the most stringent limit will be met, the Discharger must provide documentation that a less stringent but attainable limit is fully protective of all existing and probable future 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.

15. Upon completion of tasks set forth in Provisions G.13 and G.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 all applicable water quality objectives. 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 Resolutions 68-16 and 92-49.

16. 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.

17. 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.

18. The Discharger shall report to the Regional Board, within 15 days, any toxic chemical release data it reports or receives pursuant to section 313 of the "Emergency Planning and Community Right to Know Act of 1986." If the Regional Board determines that the toxic waste constituent(s) had caused, or will cause, 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(s).

19. If the Regional Board determines that waste constituents in the discharge have reasonable potential to cause or contribute to an exceedance of any Groundwater Limitation, 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.

20. 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.

21. 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.

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

I, THOMAS R. PINKOS, Acting 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 18 October 2002.

_____
THOMAS R. PINKOS, Acting Executive Officer

Order Attachments:

Monitoring Standard Provisions
A. Vicinity Map
B. Flow Diagram
C. Symbol for Recycle Water Signs
D. Information Needs for Sludge Management Plan
E. Standard Monitoring Well Provisions
F. Recommended Use Area Reporting Form
Information Sheet
Standard Provisions (1 March 1991 version) (separate attachment to Discharger only)

jay/jlk:10/18/2002

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2002-0198
FOR
CITY OF WASCO
WASTEWATER TREATMENT FACILITY
KERN COUNTY

This Monitoring and Reporting Program (MRP) is required pursuant to California Water Code section 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 B. Changes to sample location 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 should 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.

INFLUENT MONITORING

The Discharger shall collect influent samples at the headworks of the treatment facility prior to any treatment of waste. Time of a grab sample shall be recorded. Influent monitoring shall include at least the following:

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

[1] Sample frequencies referenced hereafter in this program as daily shall not include weekends or holidays.
[2] On nonconsecutive days
[3] Five-day, 20°C biochemical oxygen demand
[4] 24-hour composite sampling as referred to in this program shall be flow-proportioned
[5] Total Suspended Solids

EFFLUENT MONITORING

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

Constituent	Units	Type of Sample	Sampling Frequency[1]
Settleable Solids	mL/L	Grab	Daily
pH	pH Units	Grab	Daily
BOD_5			
Concentration	mg/L	24-hr Composite	2/Week
Monthly Average	mg/L	Calculated	Monthly
Percent Removal	%	Calculated	Monthly
TSS			
Concentration	mg/L	24-hr Composite	2/Week
Monthly Average	mg/L	Calculated	Monthly
Percent Removal	%	Calculated	Monthly
Total Dissolved Solids (TDS)[2]	mg/L	24-hr Composite	2/Month[3, 4]
EC[5]	µmhos/cm	24-hr Composite	2/Month[6]
Ammonia and Ammonium Ion (as NH_4)	mg/L	24-hr Composite	2/Month[3, 7]
Nitrate (as N)	mg/L	24-hr Composite	2/Month[3, 7]
Total Kjeldahl Nitrogen (TKN)	mg/L	24-hr Composite	2/Month[3, 7]
Total Nitrogen	mg/L	Calculated	2/Month[3, 7]
General Minerals[8]	mg/L	Grab	Semiannually[9]
Title 22 constituents[10]	varies	24-hr Composite for nonvolatile constituents, Grab for volatile organic constituents	Annually[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 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.

3 Coincident with EC sampling

4 After three months, semiannually in April and October

[5] Conductivity at 25°C
[6] In nonconsecutive weeks
[7] After three months, quarterly in January, April, July, and October
[8] General Minerals as referred to in this program shall include the constituents in the General Minerals Analyte List presented below.
[9] April and October
[10] Title 22 constituents as used in this program shall refer to constituents identified in the technical report submitted pursuant to Provision G.6.
[11] October

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 effluent 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.

POND MONITORING

The storage and disposal ponds shall be sampled systematically for the parameters specified below. Freeboard shall be monitored on the same to the nearest one tenth of a foot. Storage and disposal pond monitoring shall include at least the following:

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

[1] If results of monitoring appear to violate effluent limitations, 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 dissolved oxygen 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 the storage and disposal ponds, opposite the inlet, and analyzed for DO. Samples shall be collected between 0700 and 0900 hours. If DO results for the storage and disposal ponds indicate noncompliance with the effluent limit, the Discharger shall implement corrective measures as specified in the operation and maintenance manual and monitor said storage and disposal ponds daily until its DO stabilizes above 1 mg/L.
[3] Freeboard shall be monitored to the nearest tenth of a foot.

In addition, the Discharger shall inspect the condition of the storage and disposal ponds once per week and write visual observations in a bound logbook. Notations shall include observations of whether weeds are developing in the water or along the bank, and their location; whether dead algae, vegetation, scum, or debris are accumulating on the storage and disposal pond surface and their location; whether burrowing animals or insects are present; and the color of the storage and disposal 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.15.

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 is typically from 3 to 5 volumes of the standing water within the well casing and screen, or additionally the filter pack pore volume.

In the technical report required by Provision G.11 task f describing the results of the first sampling event performed pursuant to this program, the Discharger shall include a detailed description of the procedures and techniques for: (a) sample collection, including purging techniques, sampling equipment, and decontamination of sampling equipment; (b) sample preservation and shipment; (c) analytical procedures; and (d) chain of custody control. As it continues to monitor groundwater pursuant to this program, the Discharger shall report when it deviates from these procedures and techniques.

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 at the following frequency:

Constituent/Parameter	Units	Type of Sample	Frequency
Depth to groundwater	To 0.01 foot (hundredths)	Measured	Quarterly[1]
Groundwater elevation	Above mean sea level, to 0.01 foot	Calculated	Quarterly[1]
pH	pH Units	Grab	Quarterly[1]
Total Coliform Organisms	MPN/100 mL	Grab	Quarterly[1]
Total Organic Carbon	mg/L	Grab	Quarterly[1]
Nitrogen compounds:			
Ammonia and Ammonium Ions (as NH_4)	mg/L	Grab	Quarterly[1]

Constituent/Parameter	Units	Type of Sample	Frequency
Nitrate (as NO_3-N)	mg/L	Grab	Quarterly[1]
Total Kjeldahl Nitrogen (TKN)	mg/L	Grab	Quarterly[1]
Total Nitrogen (as N)	mg/L	Calculated	Quarterly[1]
Salinity compounds/parameters:			
EC	µmhos/cm	Grab	Quarterly[1]
Total dissolved solids	mg/L	Grab	Quarterly[1]
SAR[2]	None	Calculated	Quarterly[1]
General Minerals[3]	mg/L	Grab	Quarterly[1]
Metals	µg/L	Grag	Quarterly[1] for the first year, annually[4] thereafter
Title 22 Constituents[5]	varies	Grab	Quarterly[1] for the first year, annually[4] thereafter

1 January, April, July and October

2 Sodium adsorption ratio $(SAR) = \frac{Na}{\sqrt{\frac{Ca + Mg}{2}}}$, where Na, Cl, and Mg are in meq/L

3 Samples shall pass through a 0.45 µm filter prior to analysis.

4 October

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

Additionally, the Discharger shall include in the Provision G.11 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, section 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 G.11 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 monitored constituents selected in concurrence with Regional Board staff to perform an initial assessment of whether there is evidence of an impact from the WWTF operation or discharge. To complete this task, the Discharger shall follow its proposed Data Analysis Methods described in the technical report required by Provision G.11 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 constituents below selected in concurrence with Regional Board staff:

Groundwater Constituents to Evaluate Using Data Analysis Method

Alkalinity (as $CaCO_3$)	Hardness (as CaCO3)	Sodium
Ammonium (ammonia and ammonium ions (as NH_4)	Magnesium	Sulfate
Bicarbonate (as CaCO3)	Nitrate (as N)	TDS
Boron	Iron and Manganese	TKN
Calcium	Phosphate	TOC
Chloride	Potassium	Total Nitrogen

WATER SUPPLY MONITORING

The supply water for the City of Wasco shall be monitored as follows:

Constituent	Units	Measurement	Frequency
EC[1]	µmhos/cm	Grab	Quarterly[2]

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

[2] January, April, July and October

Following two years of sampling in the manner specified, the Discharger may, following written approval by the Executive Officer, establish a sampling station where representative samples of the City's water supply can be obtained.

[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.

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, and 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.

USE AREA MONITORING

The type of crop(s) irrigated, amounts of water and/or recycled water applied to the crops(s) (in ac-ft) and amounts of biosolids and chemical 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 F (or variation thereof subject to Regional Board staff approval) for reporting the Use Area monitoring data.

REPORTING

The Discharger shall report monitoring data and information as required in this MRP and as required in the Standard Provisions and Reporting Requirements. All reports submitted in response to this MRP shall comply with the signatory requirements in Standard Provisions, General Reporting Requirements B.3. Daily, twice weekly, weekly, twice monthly, and monthly monitoring data shall be reported in monthly monitoring reports. Monthly monitoring reports shall be submitted to the Regional Board by the **1st day of second month following sampling**. Quarterly monitoring reports shall be submitted by **1st day of second month after the calendar quarter**.

Monitoring data and/or discussions submitted concerning WWTF performance must also be signed and certified by the chief plant operator. When reports contain laboratory analyses performed by the Discharger and the chief plant operator is not in the direct line of supervision of the laboratory, reports must also be signed and certified by the chief of the laboratory.

In reporting monitoring data, the Discharger shall arrange the data in tabular form so that the date, the constituents, and the concentrations are readily discernible. The data shall be summarized in such a manner that illustrates clearly whether the Discharger complies with waste discharge requirements. If the Discharger monitors any pollutant at the locations designated herein more frequently than is required by this Order, the results of such monitoring shall be included in the discharge monitoring report.

The Discharger may also be requested to submit an annual report to the Regional Board with tabular and graphical summaries of the monitoring data obtained during the previous year. Any such request shall be made in writing. The report shall discuss any corrective actions the Discharger takes or plans to take to bring the discharge into full compliance with the waste discharge requirements.

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.4).
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 E.4 and a figure depicting monthly average discharge flow for the past five years.
6. The most recent City of Wasco annual water supply report.
7. A summary of groundwater monitoring in a format (both printed and electronic) selected in concurrence with Regional Board staff, including
    a. Hydrographs showing the groundwater elevation in approved wells for at least the previous five years or to the extent that such data are available, whichever is fewer. The hydrographs should show groundwater elevation with respect to the elevations of the top and bottom of the screened interval and be presented at a scale of values appropriate to show trends or variations in groundwater elevation. The scale for the background plots shall be the same as that used to plot downgradient elevation data;
    b. Graphs of the laboratory analytical data for samples taken from approved wells within at least the previous five calendar years (as data become available). Each such graph shall plot the concentration of one or more waste constituents specified above selected in concurrence with Regional Board staff. The graphs shall plot each datum, rather than plotting mean values, over time for a given monitoring well, at a scale appropriate to show trends or

variations in water quality. For any given constituent, the scale for the background plots shall be the same as that used to plot downgradient data.

c. All monitoring analytical data obtained during the previous four quarterly reporting periods, presented in tabular form, as well as on 3.5" computer diskette.

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 all recycled water operations for the previous water year (i.e., from October through September). The summary shall discuss total monthly water application; total wastewater recycled annually; total nutrient loading annually from applied wastewater, biosolids, and chemical fertilizers; and total estimated amount of nutrients removed through crop harvest. The summary shall also review the use area management plan (described in Provision G.10) and make recommendations regarding continuation or modification of the plan. In short, the summary shall present a mass balance relative to constituents of concern and hydraulic loading along with supporting data and calculations.

10. 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.

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

Ordered by:_____
THOMAS R. PINKOS, Acting Executive Officer

18 October 2002
(Date)

jay/jlk:10/18/2002

INFORMATION SHEET

ORDER NO. R5-2002-0198
CITY OF WASCO
WASTEWATER TREATMENT FACILITY
KERN COUNTY

Background

City of Wasco owns and operates a wastewater collection, treatment, and disposal facility (WWTF) that provides sewerage service for about 19,000 residents. The WWTF is on 7th Street about 1.5 miles west of Wasco and covers about 645 acres (Assessor Parcel Numbers 487-140-24, 487-140-52, 487-180-01, 487-200-04, and 487-200-06). The Discharger submitted a report of waste discharge (RWD) on 31 October 1997 to expand the WWTF to 3.0 mgd. The Discharger initiated construction of the expansion in October 1998 and completed construction in July 1999. The WWTF currently consists of headworks with one mechanical bar screen and a flow meter, aerated grit chamber, two primary clarifiers, two plastic media filters, two final clarifiers, two smaller bentonite-lined aerated ponds and one large (25 acre) unlined storage pond, three anaerobic sludge digesters, four sludge drying beds, three 15-acre disposal ponds and an 115-acre disposal pond on 160 acres of City-owned land referred to as the "Desert Area," and the City-owned 450-acre farmland. Waste Discharge Requirements (WDRs) Order No. 91-230, adopted by the Regional Board on 22 November 1991, prescribes requirements for the monthly average daily dry weather discharge of 1.95 million gallons per day (mgd) of treated wastewater to an unlined storage pond, and recycling on the City's 450-acre farmland (hereafter Use Area). Order No. 91-230 does not reflect the configuration of the current WWTF.

The Discharger assumed responsibilities of the WWTF when the Wasco Public Utilities District (WPUD) merged with the City of Wasco on 1 July 1989. WPUD constructed the WWTF in 1977 and expanded/upgraded the WWTF in 1988. The City expanded the WWTF again in 1998. Of the treatment units, only one of the anaerobic digesters remains from the original construction. All others, including the appurtenant facilities such as administrative building, which houses the laboratory, have been constructed since 1988. Self-monitoring reports indicate current flows average about 1.8 mgd. Winter flows do not significantly differ from summer flows.

The Discharger dries its anaerobically digested sludge in unlined drying beds. In the past, the Discharger disposed of WWTF biosolids on its Use Area as soil amendment for crops grown by a tenant farmer. However, the Discharger has not disposed of biosolids for at least the last four years and has it stockpiled on-site. The Discharger proposes to continue disposing of biosolids, including the existing stockpile, on its Use Area in the future.

The Discharger prepared an *Irrigation Management Plan, July 2000* (IMP) and performed a water balance to satisfy a requirement in WDRs Order No. 91-230. From the water balance, the required storage capacity is 457 ac-ft for disposal of 3.0 mgd. The current storage capacity of the storage and disposal ponds is 450 ac-ft. The Discharger has proposed to raise the berm around the 115-acre disposal pond in the "Desert Area" by 3 feet to provide the required storage capacity, but has not completed this work as yet.

When the Discharger proposed construction of the berm for the 115-acre disposal pond is completed, and based on the IMP data for a discharge limit of 3.0 mgd, a percolation rate of 0.15 inches/day, and an evaporation rate of 49 inches per year (adjusted for the 100-year return storm precipitation), effluent disposal by recycling in the Use Area and percolation and evaporation losses in the storage and disposal ponds annually, and percentage of disposal by each method, are as follows:

Disposal Condition	Effluent Flow[1] ac-ft	Recycling in Use Area ac-ft	Percolation Losses ac-ft	Evaporation Losses ac-ft	Total Disposal ac-ft
At Maximum Capacity	3096	1806	867	777	3450
At 3.0 mgd Discharge Limit	3096	1806	650	640	3096
At 3.0 mgd Discharge Limit	3096	58%	21%	21%	100%

[1] The IMP uses a maximum monthly daily flow of 3.0 mgd and the monthly flow pattern for 1998. Therefore, the maximum permitted discharge is less than 3.0 mgd x 365 days/year (3,350 ac-ft/year).

The IMP and the table above indicate that the actual total disposal capacity by all three methods is 3450 ac-ft/year, which means that there is excess disposal capcity of 354 ac-ft/yr. The table estimates the percentage for the different disposal methods based on disposal of the actual effluent flow.

The Discharger has been recycling effluent from the WWTF on about 390 acres of the 450 acre Use Area with authorization from the Regional Board in Order No. 91-230. To dispose of 3.0 mgd, the Discharger proposed to expand irrigation in the Use Area from 390 acres to at least 445 acres. The Discharger has proposed to do this by converting 55.5 acres of alfalfa from fresh water irrigation to recycled water irrigation.

The Discharger in its IMP has characterized the WWTF effluent total nitrogen to be 14 mg/L. Using the IMP's average irrigation rate of 4.15 feet/year, the average nitrogen loading is 158 lbs/acre/year. The highest irrigation and nitrogen loading rate is on alfalfa with 6.2 feet and 840 lbs/acre per year, respectively. The lowest rate is on blackeye beans at 3.2 feet and 121 lbs/acre per year, respectively. Both the hydraulic and nitrogen loadings appear not to exceed agronomic demand except for the nitrogen loading for blackeye beans, which exceeds the nitrogen demand of 100 lb/acre/year by 21 lbs/acre/year. However, the Discharger indicates that the area planted with blackeye beans will be double cropped, which should reduce the nitrogen loading to levels not in excess of agronomic demand.

Compliance History

Regional Board staff conducted two inspections of the WWTF in the last three years – on 28 October 1999 with a resultant Notice of Violation (NOV) issued on 1 February 2000 and 14 November 2001 with a resultant NOV issued on 3 December 2001. The 1 February 2000 NOV cited the Discharger for failure to preclude public access to the disposal ponds, failure to maintain a dissolved oxygen concentration of 1.0 mg/l in ponded wastewater, and failure to dispose of sludge in a timely manner consistent with Title 27, CCR. The 3 December 2001 NOV cited the Discharger for using an uncertified laboratory for sample analyses.

The Discharger has corrected all the cited violations except for disposal of its stockpiled biosolids. The Discharger indicated by letter dated 4 January 2002 that it intends to dispose of the biosolids by 15 March 2002. By letter dated 28 March 2002, the Discharger indicated that it had not disposed of the biosolids as yet and that it is working on the permit to dispose of it in the Use Area.

Order No. 91-230 requires the Discharger to submit an engineering report to the California Department of Health Services (DHS) pursuant to Title 22, California Code of Regulations (CCR), section 60323. The Discharger did not submit the Title 22 Engineering Report. Regional Board letter dated 3 December 2001 requested the Discharger to submit the Title 22 Engineering Report by 5 March 2002. Receiving no response, staff by Regional Board letter dated 3 April 2002 requested the Discharger to submit the report by 18 April 2002. By letter dated 18 April 2002, the Discharger requested a 60-day extension of the due date to 18 June 2002. The Discharger finally submitted the delinquint report on 1 August 2002. The report is under review by Regional Board staff and DHS.

Title 22 restricts uses of recycled water for the different levels of treatment. For undisinfected secondary recycled water, recycled water is restricted to fodder or fiber crops and food crops that undergo commercial pathogenic destroying process. The Discharger's tenant farmer grows blackeye beans that may be a food crop. By letter dated 3 July 2002, the Discharger's tenant farmer certified that the blackeye bean crops were used for seed only and not for human consumption. DHS reviewed the certification and, by letter dated 9 July 2002, indicated that the certification alone was insufficient to ensure that the crops would not be used for human consumption. DHS further indicated that the Title 22 requirements for crop use must be clearly described in the Title 22 engineering report and included as a provision in the WDRs.

Expansion

As previously stated, the City expanded the WWTF to a treatment capacity of 3.0 mgd pursuant to its 31 October 1997 RWD. The Discharger submitted certification of the treatment capacity expansion project completion to State Board. By State Board letter dated 23 July 2001, the Division of Clean Water Programs approved the Discharger's 17 July 2001 "Certificate of Performance for Publicly Owned Treatment Works" and its 6 July 2001 Project Performance Certification report. The description of the WWTF reflects the facility after the expansion.

Groundwater Conditions

Regional groundwater flows northwesterly and the depth of water occurs about 200 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) in Spring 1997. Soils in the WWTF vicinity and Use Area are classified as sand loam, fine sand loam, and clay loam according to the U. S Natural Resources Conservation Service. The soils are well drained and exhibit rapid infiltration rates as demonstrated by the Discharger in a simply percolation test in the summer of 2000, which indicated the percolation rate of the soil to be about 0.25 feet per day.

In June 1999, the Discharger installed three groundwater monitoring wells in the vicinity of the WWTF and Use Area in June 1999 as shown in Attachment A. Well elevations ranged from 278 – 295 feet mean sea level (msl) and groundwater elevations ranged from from 209 to 219 feet msl. Screened intervals ranged from 20 – 40 feet straddling the groundwater table. The Discharger did not comply with Order No. 91-230 to collect 12 monthly samples from these wells after installation and, after being reminded of this requirement, has collected only four samples from these monitoring wells thus far. The table below reflects the data from these four samples.

Constituent	Units	MW-1	MW-2	MW-3
Average Depth to GW	Feet	83	76	58
Average GW Elevation	Feet msl[1]	209	219	219
NO_3-N	mg/L	4.7	3.1	6.9
Total N	mg/L	6.4	4.1	8.1
EC	µmhos/cm	813	587	826
TDS	mg/L	510	374	603
Chloride	mg/L	35	39	52
Calcium	mg/L	105	57	74
Sodium	mg/L	62	61	129
Boron	mg/L	0.15	<0.10	0.20

[1] Mean sea level
[2] Below ground surface

Since the data reflects results from only one to four samples (not all constituents were tested for in all four samples) from each well, characterization of the groundwater quality is premature. Regional Board by letter dated 17 December 2001 requested the Discharger to collect and analyze groundwater samples from the three recently installed monitoring wells twice-monthly for six months (until June 2002). The Discharger is currently collecting the data.

The Discharger, in its *Revised Groundwater Assessment Report, 27 April* 2001 and confirmed by letter dated 7 December 2001, proposes to install three additional monitoring wells – two in the WWTF area

and one in the Use Area – but has not completed the installation as yet. After collecting the sampling data indicated above, the Discharger will re-evaluate, and resubmit, the proposed locations of the three wells for Regional Board approval.

Land Use Near the Facility

Land Use in the WWTF and Use Area vicinity is primarily agricultural, although there are a state prison, a golf course and a cemetery within one-half mile. Crops grown within a one-mile radius of the WWTF include cotton, corn, sugar beets, artichokes, beans (dry), carrots, flowers, alfalfa, grain crops, almonds, walnuts, pistachios and oranges according to DWR land use data published in 1998. Most crops in this area are flood irrigated, although some are sprinkler, micro-sprinkler, or drip irrigated, according to the University of California Cooperative Extension.

The state prison indicated above is the Wasco State Prison. It is directly west of the Discharger's disposal ponds and occupies almost all of Section 8, T27S, R24E, MDB&M as shown on Attachment A. The prison is surrounded by its WWTF to the south and use area to the west and north. WDRs Order No. 90-217 regulates the prison's WWTF. According to the prison's 2001 annual report to the Regional Board, the prison treated about 278 million gallons (853 ac-ft) of wastewater in 2001 (0.76 mgd). The prison applied an estimated 1023 ac-ft of effluent and 609 ac-ft of groundwater on 296 acres of alfalfa. The one sample taken of the effluent indicated that total nitrogen is about 18 mg/L. Total nitrogen from wastewater applied to the crops is 169 lbs/ac/yr. An additional 200 tons of biosolids with a total nitrogen concentration of 3700 mg/kilogram (1480 lbs of nitrogen) were applied to crops and non-farmed areas. Highest nitrogen loading from wastewater and biosolids is about 243 lbs/ac/yr in about 10 acres of crop, much less than the nitrogen uptake rate of 480 lbs/ac/yr for alfalfa. Order No. 90-217 does not require groundwater monitoring. Therefore, there is insufficient data to determine the impact on groundwater of the combined discharges from the prison and the City of Wasco.

Basin Plan, Beneficial Uses, and Regulatory Considerations

The WWTF is in the North Kern Hydrologic Area of the South Valley Floor 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 groundwater beneficial uses (industrial service, industrial process, agricultural, and munipal and domestic supplies in this instance), the procedure for application of water quality objectives, and the process for and factors to consider in allocating waste assimilation capacity.

There are no surface waters close by the WWTF. Surface water drainage in the area is by sheet flow to natural or manmade drainage ways then to the valley floor or Tulare Lake as there is no recognized surface water close by the WWTF Existing or potential beneficial uses of surface waterways identified in the Basin Plan for Valley Floor Waters are agricultural supply, industrial service supply, industrial

process supply, water contact recreation, noncontact water recreation, warm freshwater habitat, wildlife habitat, rare, threatened, or endangered species, and 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. 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 and suspended solids."

DHS has established statewide recycling criteria in Title 22, CCR, section 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 existing 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.

Title 22 section 60304(d) allows for the use of undisinfected secondary recycled water for prescribed applications involving certain food and seed crops, subject to various restrictions. Because undisinfected secondary recycled water would represent a potential public health threat if food or seed crops were directly or indirectly exposed to the undisinfected recycled water, it is imperative that the restrictions outlined with the identified uses under section 60304(d) are strictly complied with. If a recycler cannot provide the necessary assurances that applicable restrictions can be complied with at all times, it is appropriate for the Regional Board to either require a higher level of treatment (i.e., disinfection) or restrict applications of undisinfected secondary recycled water to crops not intended for human consumption (e.g., fodder and fiber crops) and food crops that undergo commercial pathogenic destroying processing.

Antidegradation

In allowing a discharge, the Regional Board must comply with CWC section 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 section 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, 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 section 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 section 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 section 13241 factors over another. Regardless, section 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) Order WQ 95-4, slip op. page 5). Even where a Basin Plan narrative objective exists, and the Regional Board adopts a numeric effluent limitation in WDRs to implement the narrative objective, the Regional Board does not have to consider the factors in CWC section 13241.

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 section 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, sections 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 toxicity objective also requires consideration of the concentration of trihalomethanes, a potential byproduct from chlorine disinfection of effluent. Total trihalomethanes (TTHMs) are chlorinated organic materials that are toxic at low concentrations and are consequently listed as priority pollutants. Common TTHMs include bromoform, bromodichloromethane, chloroform, and dibromochloromethane. While State drinking water regulations establish a maximum contaminant

level for TTHMs of 100 µg/L (Title 22, CCR, section 64439), the actual concentrations at which TTHMs components are considered "toxic" to humans are much lower (e.g., chloroform's human health toxicity limit is 1.1 µg/L).

The procedure for the Regional Board to follow in establishing numerical receiving water limitations in waste discharge requirements that will implement Basin Plan narrative objectives is described on 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.

The following constituent concentrations are what the Basin Plan and referenced documents of recognized authorities indicate cannot be exceeded without causing some adverse impact on the listed beneficial use. For agricultural use and the waste constituents listed, crop application is consistently more sensitive than animal uses, but there may be several concentration thresholds that apply dependent upon the crop and how irrigation takes place. Unless the more sensitive thresholds can be ruled out because the circumstances or crop are not applicable or probable, the most sensitive criteria must apply for the discharge to be consistent with Resolution 68-16.

Constituent	Units	Value	Beneficial Use	Criteria or Justification
Ammonium ion as NH_4	mg/L	0.5	MUN[1]	Taste and Odor[2]
Boron	mg/L	0.5	AGR[3]	Boron sensitivity[4]
Chloride	mg/L	106	AGR[3]	Chloride sensitivity of certain crops irrigated via sprinklers[4]
		142	AGR[3]	Chloride sensitivity of certain crops[4]
		175	AGR[3]	Chloride sensitivity of certain crops[5]
		250	MUN[1]	Recommended Secondary MCL[6]
		500	MUN[1]	Upper Secondary MCL[6]
Conductivity (EC)	µmhos/cm	700	AGR[3]	Salt sensitivity[4]
		900	MUN[1]	Recommended Secondary MCL[6]
		1,600	MUN[1]	Upper Secondary MCL[6]
Iron	mg/L	0.3	MUN[1]	Secondary MCL[7]
Manganese	mg/L	0.05	MUN[1]	Secondary MCL[7]
Nitrate as N	mg/L	10	MUN[1]	Primary MCL[8]
Nitrite as N	mg/L	1	MUN[1]	Primary MCL[8]
pH	pH Units	6.5 to 8.5	MUN	Secondary MCL[9]
Sodium	mg/L	69	AGR[3]	Sodium sensitivity of certain crops irrigated via sprinklers4
		115	AGR[3]	Sodium sensitivity of certain crops[5]
Total Coliform Organisms	MPN/100 mL	2.2	MUN[1]	Basin Plan
Total Dissolved Solids	mg/L	450	AGR[3]	Salt sensitivity[4]
		500	MUN[1]	Recommended Secondary MCL[6]
		1,000	MUN[1]	Recommended Upper MCL[6]

Constituent	Units	Value	Beneficial Use	Criteria or Justification
Total Trihalomethanes	µg/L	100	MUN	MCL[10]
Chloroform	µg/L	1.1	MUN[1]	Narrative Toxicity Criteria[11]
Bromodichloromethane	µg/L	0.27	MUN[1]	Narrative Toxicity Criteria[11]
Dibromochloromethane	µg/L	0.37	MUN[1]	Narrative Toxicity Criteria[11]
Bromoform	µg/L	4.3	MUN[1]	Narrative Toxicity Criteria[11]

[1] Municipal and domestic supply
[2] United Kingdom Water Supply (Water Quality) Regulations 1989 (as amended...) for England and Wales)
[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] Agricultural Salinity Assessment and Management. American Society of Civil Engineers Manuals and Reports on Engineering Practice No. 71, New York (1996)
[6] Title 22, CCR, section 64449, Table 64449-B
[7] Title 22, CCR, section 64449, Table 64449-A
[8] Title 22, CCR, section 64431, Table 64431-A
[9] United States Environmental Protection Agency
[10] Title 22, CCR, section 64439
[11] California Environmental Protection Agency, Office of Environmental Health Hazard Assessment Cancer Potency Factor as a Drinking Water Level, *California Environmental Protection Agency Toxicity Criteria Database*

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. Constituents that are critical are individually listed. 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 use 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 percent) 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.

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 without filtration (e.g., sequencing batch reactor, oxidization ditch). Application of such technology also yields significant nitrogen removal (to below 5 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, section 64449, Table 64449-A). The taste threshold for ammonium (ammonia and ammonium ions as NH_4)in drinking water is 0.5 mg/L, according to the United Kingdom's Water Supply (Water Quality) Regulations 1989 (as amended...) for England and Wales.. 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, section 20005 et seq. (Title 27), contains regulations to address certain discharges to land. Title 27 establishes a waste classification system, specifies siting and construction standards for full containment of classified waste, requires extensive monitoring of groundwater and the unsaturated zone for any indication of failure of containment, and specifies closure and post-closure maintenance requirements. Generally, no degradation of groundwater quality by any waste constituent in a classified waste is acceptable under Title 27 regulations.

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 section 20090(a), provided that the facilities not result in a violation of any water quality objective. However, residual sludge (for the purposes of the proposed Order, sludge that will not be subjected to further treatment by the WWTF) is not exempt from Title 27. Solid waste (e.g., grit and screenings) that results from treatment of domestic sewage and industrial waste also is not exempt from Title 27. This residual sludge and solid waste are subject to the provisions of Title 27.

Accordingly, the municipal discharge of effluent and the operation of treatment or storage facilities associated with a municipal wastewater treatment plant can be allowed without requiring compliance with Title 27, but only if 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

The City of Wasco prepared an Environmental Assessment/Initial Study Findings and Determination for the WWTF expansion project in support of CEQA (Public Resources Code section 21000 et seq.) and State CEQA guidelines (Title 14, Division 6, California Adminstrative Code) and the National Environmental Policy Act requirements for the U.S. Department of Housing and Urban Development. Using this as the supporting document, Kern County Community Development Program Department certified a Mitigated Negative Declaration (MND) for the WWTF expansion on 14 January 1998 in accordance with CEQA and the State CEQA guidelines. The Regional Board staff has reviewed these documents and recommend that the Regional Board, as a responsible agency under CEQA, find that

they do not adequately address or mitigate the potential significant adverse effects on groundwater of leachate from the unlined sludge drying beds and stockpiled biosolids in unlined storage areas. Leachate from unlined sludge drying beds and unlined biosolids storage areas may degrade or pollute groundwater. The proposed Order includes mitigating measures that preclude the Discharger from discharging or releasing waste constituents that may violate groundwater limitations (e.g., Discharge Specification B.16, Sludge Specifications D.2 and D.3, and tasks and implementing schedule for compliance in Provision G.8)

PROPOSED ORDER TERMS AND CONDITIONS

Phased Approach

The discharge has been occuring 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. In addition, as explained elsewhere in this information sheet, certain aspects of waste treatment and control practices can be improved and therefore cannot be justified as representative of BPTC (e.g., unlined sludge drying beds, stockpiled biosolids on-site for longer than three years).

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 requires 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 the Discharger to 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., oranges) and crops sensitive to sodium and chloride (e.g., oranges, almonds). These crops fall within the sensitive categories, but not the most sensitive, and require stringent protection thresholds unless, for chloride, it can be established that sprinkler irrigation is not practiced and will not be practiced. 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 prohibits discharge to surface waters and water drainage courses and cross connection between potable water and well water piping with recycled water piping.

The proposed Order carries over the existing Order's effluent salinity limitation of the monthly flow-weighted average EC of the source water plus 500 μmhos/cm. However, it lowers the total EC limit from of 1000 μmhos/cm to 900 μmhos/cm to be protective of the salt sensitive crops grown in the WWTF area. 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 effluent limits prescribed in the proposed Order for settleable solids and BOD_5 are based on the Basin Plan and are carried over from the existing Order. The effluent limit prescribed for total suspended solids (TSS) is based on the Basin Plan and would be added to the proposed Order. The proposed Order's Discharge Specification B.6 implements the Basin Plan's requirement that municipal facilities designed to discharge greater than 1 mgd provide 80 percent removal efficiency or reduction to a concentration of 40 mg/L, whichever is more restrictive, of both 5-day BOD and TSS.

The proposed Order requires the Discharger to submit a technical report certifying that the WWTF is capable of consistently disposing of 3.0 mgd of wastewater. If the technical report indicates that the WWTF disposal capacity is less than 3.0 mgd, the permitted discharge will remain at the current 1.95 mgd, unless modified by either the Discharger increasing the capcity to at least 3.0 mgd, or the Order amended to increase the permitted discharge to the reported capacity.

The proposed Order requires the Discharger to comply with the recycling criteria of Title 22. To ensure compliance with Title 22 and Regional Board recycling policies, the proposed Order requires the Discharger to comply with treatment process, reliability and monitoring requirements. It restricts Use Area crops to those that can be irrigated with undisinfected secondary recycled water and implement 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). To this end, the proposed Order requires the Discharger to submit a use area management plan.

The conditions for sludge, solid waste, and biosolids management proposed in the proposed Order assures that degradation resulting from the City's management of sludge is in accordance with the Basin Plan. To this end, the proposed Order requires the Discharger to submit a technical report describing its sludge management plan. It 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, and with the statewide "General Order for the Discharge of Biosolids" (Water Quality Order No. 2000-10-DWQ) (or any subsequent document which replaces Order No. 2000-10-DWQ).

The proposed Order prescribes 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 would 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 prescribes numeric objectives derived from narrative objective as described herein. The Phase 1 process would 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 implements existing objectives, the Regional Board need not undertake further consideration of the factors in CWC section 13241 (including economic considerations). Groundwater limitations that would be prescribed by the proposed Order are:

> Groundwater Limitation F.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 F.2 implements the Basin Plan's narrative objective for chemical constituents. The value for total nitrogen of 10 mg/L in Groundwater Limitation F.2.a ensures that groundwater nitrate levels remains 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 F.2.a ensure that groundwater salinity levels remains at or below that necessary to sustain agricultural beneficial use. The values for chemical constituents prescribed in Groundwater Limitation F.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 F.2.c implements 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 F.2.d implements the Basin Plan's narrative objective for taste- and odor-producing substances, and establishes a numerical receiving water limitation for ammonium (ammonia and ammonium ions as NH_4) to ensure groundwater ammonia levels will remain at or below that necessary to protect domestic and municipal uses.

The proposed Order requires the Discharger's groundwater monitoring network 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 do 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.

The Discharger currently has a groundwater monitoring network of three monitoring wells, which has not been approved. It proposes to collect 12 samples, review the adequacy of the existing groundwater monitoring network, and propose a revised groundwater monitoring network of at least five monitoring wells. The proposed Order provides a schedule for proposing and installing the revised monitoring network. Until the approved revised network is installed, the Regional Board cannot adequately evaluate compliance with groundwater limitations. Use of existing groundwater monitoring wells would continue for the purposes of monitoring the effects of the discharge on the groundwater; however, evaluating the effectiveness of BPTC and compliance with groundwater limitations cannot be accomplished until the proposed groundwater monitoring network is approved by the Executive Officer in accord with the process outlined in the proposed Order.

The proposed Order requires the Discharger to characterize the discharge for constituents identified in Title 22, CCR, sections 64431 (Inorganic Chemicals, including Fluoride), 64443 (Radioactivity), 64444 (Organic Chemicals), and 64449 (Secondary MCLs – Consumer Acceptance Limits).

The proposed Order requires the Discharger to modify its sludge management and operations to preclude leachate from its unlined sludge drying beds and unlined biosolids storage area from percolating to goundwater.

Pursuant to CWC section 13263.6, the proposed Order includes a requirement for the Discharger to report to the Regional Board any toxic chemical release data it reports or receives pursuant to section 313 of the "Emergency Planning and Community Right-To-Know Act" so that the Regional Board can reopen the adopted Order and prescribe effluent limitations for those constituents that have caused or may cause a violation of water quality objectives.

Monitoring Requirements

The proposed Order requires influent monitoring of daily flow, settleable solids, pH, BOD_5, and TSS. It adds pH and TSS to influent monitoring not required in the current Order. The proposed Order requires effluent monitoring of settleable solids, pH, BOD_5, TSS, TDS, EC, ammonia, nitrate, TKN, total nitrogen, general minerals, and appropriate Title 22 drinking water constituents. It adds TSS TDS, ammonia, total nitrogen, general minerals, and Title 22 drinking water constituents to effluent monitoring not required in the current Order. Effluent monitoring of these constituents is necessary to check compliance with various discharge specifications. The addition of pH, TDS, ammonia, general minerals, and Title 22 constituents is to develop a more accurate characterization of the discharge, while the addition of total nitrogen monitoring is to quantify the amount of nitrogen loading. Effluent monitoring is conducted before the effluent enters the storage ponds.

The proposed Order also includes pond, groundwater, supply water, and sludge monitoring as detailed below. The monitoring is necessary to evaluate groundwater quality and the extent of the degradation and pollution from the discharge. The proposed Order includes monitoring of recycling activities to check compliance with Title 22 and the terms and conditions of the proposed Order.

To determine if the Discharger is in compliance with Discharge Specification B.3, the proposed Order requires the Discharger to monitor its source water quarterly for EC. To determine the efficiency of the Discharger's operation, the proposed Order requires the Discharger to monitor influent twice weekly for settleable solids, pH, BOD_5, and TSS. In order to adequately characterize its wastewater effluent, it requires the Discharger to monitor daily for settleable solids, and pH; twice weekly for BOD_5, and TSS; and twice monthly for TDS, EC, and nitrogen constituents; and semiannually for general minerals, and annually for Title 22 constituents. To monitor the storage and disposal ponds for capacity constraints and potential nuisance conditions, it requires the Discharger to monitor freeboard available weekly and dissolved oxygen (DO) content daily. While current Order requires twice weekly DO monitoring, the Discharger conducted daily monitoring because the storage ponds were part of the treatment system. Because the effluent will be monitored upstream of the storage ponds, the proposed Order requires additional monitoring and will formalize the Discharger's current activity.

The proposed Order requires annual sludge monitoring in accordance with EPA's *POTW SLUDGE SAMPLING AND ANALYSIS GUIDANCE DOCUMENT, AUGUST 1989,* for arsenic, cadmium, molybdenum, copper, lead, mercury, nickel, selenium, and zinc. The proposed Order requires the Discharger to submit an annual summary of sludge discharge operations.

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 includes monitoring of applied waste quality, application rates, and groundwater.

The proposed Order requires 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. 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 waste sources. The Discharger currently has a groundwater monitoring network, which is not yet approved, and is collecting groundwater samples. The Discharger proposes to revise the groundwater monitoring network, as necessary, to monitor compliance with groundwater limitations after collecting 12 samples. The proposed Order requires the Discharger to install such well(s) for a revised groundwater monitoring network as necessary. The proposed Order requires the Dsicharger to monitor and characterize background water quality, after the revised monitoring network is approved, over a one-year period of quarterly groundwater sampling events. To reduce costs, monitoring in groundwater 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.

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. However, information is presently insufficient to develop final effluent and groundwater limitations, so the proposed Order sets 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 would be 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 that could involve substantial cost. It may be appropriate to reopen the Order if applicable laws and regulations change, but the mere possibility that such laws and regulations may change is not sufficient basis for reopening the Order. The CWC requires that waste discharge requirements implement all applicable requirements.

jay/jlk:10/18/2002

ATTACHMENT A
LOCATION MAP
WASTE DISCHARGE REQUIREMENTS ORDER NO.
CITY OF WASCO
WASTEWATER TREATMENT FACILITY
KERN COUNTY
Section 9, 16, and 17, T27S R24E, MDB&M, USGS 7.5' _____ Quadrangle

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0198
FOR
CITY OF WASCO
WASTEWATER TREATMENT FACILITY
KERN COUNTY

ATTACHMENT D
INFORMATION NEEDS FOR SLUDGE MANAGEMENT PLAN

A. Wastewater Treatment Facility (WWTF)
   1. Describe treatment processes at the wastewater treatment facility.
   2. List significant industrial users (SIUs) that discharge to the wastewater treatment facility and describe how SIUs affect sludge production, sludge handling, and biosolids disposal.
   3. Indicate whether the WWTF has an adopted source control ordinance or a pretreatment program, and if the latter whether the program is approved by the Regional Board.
   4. Indicate whether WWTF accepts septage and, if so, describe septage handling operation facilities.
   5. Provide a WWTF site map showing:
      a. existing sludge handling facilities (e.g., sludge drying beds and sludge storage areas)
      b. abandoned sludge handling facilities (if applicable)
      c. location of groundwater monitoring wells, if any, and groundwater gradient.

B. Sludge Production
   1. Provide a schematic diagram showing solids flow and sludge handling operations; include, where applicable, supernatant flow and handling operations.
   2. Specify the quantity of sludge expected to annually accumulate in each wastewater treatment process, how it is quantified, and the expected removal frequency.
   3. For sludge handling facilities with sludge drying beds:
      a. Describe number and size of sludge drying beds.
      b. Describe sludge drying bed construction (e.g., liner construction and design hydraulic conductivity, collection systems for leachate and/or decant).
      c. Describe leachate and/or decant treatment and disposal.
      d. If sludge drying beds are not lined, thoroughly describe measures taken to ensure that area groundwater is not adversely affected by sludge drying operations.
      e. Indicate the expected frequency with which sludge will be applied to and removed from sludge drying beds.
   4. Describe how biosolids are transferred to onsite biosolids storage facility (if applicable). If biosolids are removed directly from sludge drying beds, provide a plan that indicates when biosolids are disposed of and confirm that the entity responsible for biosolids disposal will be able to remove and dispose of biosolids at the scheduled time.

C. Biosolids Characterization

1. Describe proposed sampling procedures by indicating number of samples, sample locations, and sample composition. For reference consult *POTW Sludge Sampling an Analysis Guidance Document*, published by the EPA Publication No. 833-B-89-100.
2. Thoroughly describe the methods proposed to meet the necessary levels of pathogen reduction (i.e., Class A or B according to 40 CFR 503.32) for the proposed method of sludge disposal.
3. Describe the methods proposed to meet vector reduction requirements, in accordance with 40 CFR Part 503.33.

D. Biosolids Storage

1. If on-site biosolids storage is used,
   a. Describe:
      i. Size of biosolids storage area
      ii. How frequently it will be used (emergency basis only or routine use)
      iii. Typical storage duration
      iv. Leachate controls
      v. Erosion controls
      vi. Run-on/runoff controls
   b. Indicate measures that will be taken to ensure that area groundwater is not adversely affected by the biosolids storage facility.
   c. For biosolids storage facilities that contain biosolids between 1 October and 30 April, describe how facilities are designed and maintained to prevent washout or inundation from a storm or flood with a return frequency of 100 years.
   d. Provide a map of showing setback distances from (where applicable)
      i. Property lines
      ii. Domestic water supply wells
      iii. Non-Domestic water supply wells
      iv. Public roads and occupied onsite residences
      v. Surface waters, including wetlands, creeks, ponds, lakes, underground aqueducts, and marshes
      vi. Primary agricultural drainage ways
      vii. Occupied non-agricultural buildings and off-site residences
      viii. Primary tributary to a waterway or reservoir used for domestic water supply
      ix. Domestic surface water supply intake

E. Spill Response Plan

1. Emergency contacts and notification procedures
2. Personal protective equipment requirements
3. Response instructions for
   a. spill during biosolids transport
   b. storage facility failure
   c. when hazardous or other unauthorized material is found

F. Method of Disposal

1. Describe and provide the following information related to biosolids disposal method(s). If more than one method will be utilized, include the percentage of annual biosolids production expected to be disposed of by each method.
   a. Landfill Disposal
      i. Name(s) and location(s) of landfill(s).
      ii. Waste discharge requirements order numbers adopted by the Regional Board that regulate the landfill(s).
      iii. Present classification of the landfill(s).
      iv. Name and telephone number of the contact person at the landfill(s).
   b. Incineration
      i. Name(s) and location(s) of incineration site(s).
      ii. Waste discharge requirements order numbers adopted by the Regional Board that regulate the incineration site(s).
      iii. Method of disposal of ash from the incineration site(s).
      iv. Names and locations of facilities receiving ash from the incineration site(s), if applicable.
      v. Name and telephone number of the contact person at the incineration site(s).
   c. Composting
      i. Name(s) and location(s) of composting site(s).
      ii. Waste discharge requirements order numbers adopted by the Regional Board that regulate the composting site(s).
      iii. Name and telephone number of the contact person at the composting site(s).
   d. Land Application
      i. Ownership of the site(s) where biosolids are applied.

ii. Assessor Parcel Numbers (APNs) of site(s) where biosolids are applied.

iii. Waste discharge requirements order numbers adopted by the Regional Board that regulate the biosolids application site(s).

WASTE DISCHARGE REQUIREMENTS ORDER NO. R5-2002-0198
FOR
WASTEWATER TREATMENT FACILITY
CITY OF WASCO
KERN COUNTY

ATTACHMENT E
STANDARD MONITORING WELL PROVISIONS

Prior to installation of groundwater monitoring wells, the Discharger shall submit a work plan 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 work plans 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
   - Borehole diameter
   - Depth of surface seal
   - Well construction materials
   - Diagram of well construction
   - Type of well cap
   - Size of perforations and rationale
   - Grain size of sand pack and rationale
   - Thickness and position of bentonite seal and sand pack
   - 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
   - Analyses to be run and methods
   - Sample collection and preservation method
   - Intervals at which soil samples are to be collected
   - Number of soil samples and rationale
   - Location of soil samples and rationale
   - QA/QC procedures

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