

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

ORDER NO.R5-2004-0132

MASTER RECLAMATION PERMIT  
FOR  
THE CITY OF BRENTWOOD  
WASTEWATER TREATMENT PLANT  
CONTRA COSTA COUNTY

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

1. The City of Brentwood (hereafter City or Discharger) owns and operates a wastewater treatment plant (WWTP), which has three disposal methods as described in the City's National Pollutant Discharge Elimination System (NPDES) Permit, Waste Discharge Requirements (WDRs) Order No. 5-00-171: off site reclamation, land disposal into existing percolation ponds, and discharge to Marsh Creek. To minimize discharge to Marsh Creek the Discharger is proposing to implement off-site reclamation. On 31 March 2003, the Discharger submitted a Report of Waste Discharge (RWD), and applied for a master reclamation permit to allow for the distribution and use of recycled water within its service area.
2. The California Department of Health Services (DHS) has established statewide recycling criteria in Chapter 3, Division 4, Title 22, California Code of Regulations (CCR), Section 60301, et seq. (Hereafter Title 22) for the use of recycled water for food crop, fodder, fiber, seed crop and landscape irrigation and impoundment supply. DHS revised the water recycling criteria contained in Title 22 on June 2001. The Discharger shall comply with these and other applicable regulations that apply to the production and use of recycled water.
3. The City's WWTP is capable of producing high quality tertiary effluent to comply with Title 22 wastewater reclamation criteria. The WWTP system consists of screening, grit removal, oxidation and nitrification (by extended aeration activated sludge), denitrification (by anoxic basins), coagulation, tertiary treatment filtration, chlorination and dechlorination.
4. This Order is adopted pursuant to Section 13523.1, Chapter 7, Article 2 of the California Water Code (CWC), which authorizes issuance of a Master Reclamation Permit to suppliers or distributors, or both, of recycled water in lieu of issuing individual water reclamation requirements to each Recycled Water User (hereafter User(s)).
5. As specified by CWC section 13523.2, this Order includes requirements for the Discharger to establish and enforce rules and regulations for recycled water users in accordance with statewide recycling criteria, and to conduct periodic inspections of the recycled water use sites.
6. The Regional Board adopted a Water Quality Control Plan, Fourth Edition, for the Sacramento River Basin and San Joaquin River Basin, (hereafter Basin Plan) that designates

beneficial uses, establishes narrative and numerical water quality objectives, and contains implementation plans and policies for protecting all waters of the Basin. The Basin Plan includes plans and policies of the State Water Resources Control Board (State Board) incorporated by reference. Pursuant to Section 13263(a) of the CWC, these requirements implement the Basin Plan and, by extension, the beneficial uses of surface and groundwaters potentially affected by the discharge. The Basin Plan also encourages water recycling.

### **Basin Plan, Beneficial Uses, and Regulatory Considerations**

7. The Water Quality Control Plan for the Sacramento River Basin and San Joaquin River Basin, Fourth Edition (hereafter Basin Plan) designates beneficial uses, establishes narrative and numerical water quality objectives, and contains implementation plans and policies for protecting all waters of the Basin. The Basin Plan includes plans and policies of the State Water Resources Control Board (State Board or SWRCB) incorporated by reference. Pursuant to Section 13263(a) of the CWC, waste discharge requirements must implement the Basin Plan and, by extension, the beneficial uses of surface and groundwaters potentially affected by the discharge.
8. The Basin Plan defines groundwater as including “all subsurface waters that occur in fully saturated zones and fractures within soils and other geologic formations” (page I-1.00).
9. The Basin Plan designates the beneficial uses of groundwater in the discharge area as municipal and domestic supply, agricultural supply, industrial service supply, and industrial process supply.
10. The Basin Plan establishes numerical and narrative water quality objectives for surface water and groundwater within the basin. Numerical water quality objectives are maximum limits directly applicable to the protection of designated beneficial uses of the water. The Basin Plan requires that the Regional Board, on a case-by-case basis, follow specified procedures to determine maximum numerical limitations that apply the narrative objectives when it adopts waste discharge requirements. The Basin Plan also stipulates the water quality objectives “apply to all waters within a surface water or ground water resource for which beneficial uses have been designated, rather than at intake, wellhead, or other point of consumption” (page IV-16.00).
11. Water quality objectives for groundwater include narrative objectives for chemical constituents and toxicity of groundwater. The toxicity objective requires that groundwater be maintained free of toxic substances in concentrations that produce detrimental physiological responses in humans, plants, or animals. The chemical constituent objective states groundwater shall not contain chemical constituents in concentrations that adversely affect any beneficial use.
12. For groundwaters designated as municipal supply, the Basin Plan establishes numerical objectives for bacteria and for chemical constituents related to drinking water quality. The water quality objective for groundwater for bacteria states: “In ground waters used for

domestic or municipal supply (MUN) the most probable number of coliform organisms over any seven-day period shall be less than 2.2/100mL” (page III-9.00). Numerical water quality objectives related to drinking water quality include maximum contaminant levels (MCLs) in Title 22, CCR (i.e., Section 64431 (Inorganic Chemicals); Section 64431 (Fluoride); Section 64443 (Radioactivity); Section 64444 (Organic Chemicals); and Section 64449 (Secondary MCLs - Consumer Acceptance Limits)).

13. As knowledge about concentrations harmful to public health is always expanding, the Basin Plan's incorporation of MCLs by reference is prospective to incorporate changes to MCLs as changes in Title 22 take effect. However, in event of such a change, its implementation would be affected through reopening of this Order and reconsideration of discharge requirements. The Basin Plan requires the application of objectives more stringent than MCLs as necessary to ensure that waters do not contain chemical constituents, toxic substances, radionuclides, or pesticides in concentrations that adversely affect domestic drinking water supply, agricultural supply, or some other beneficial use.
14. The Regional Board applies objectives to all groundwaters designated as municipal or domestic supply (MUN), not just those waters currently used for MUN. This interpretation is consistent with the CWC and the Basin Plan and was affirmed by State Board Order No. WQO-2003-0014. The Regional Board has consistently interpreted the objective to apply to groundwater designated for MUN, not just to groundwaters currently used for MUN purposes. The Regional Board has a long-standing pattern and practice of adopting WDRs that reflect this interpretation.
15. The Policy for Application of Water Quality Objectives (page IV-16.00) states: “*Water quality objectives apply to all waters within a surface water or ground water resource for which beneficial uses have been designated, rather than at intake, wellhead, or other point of consumption.*” Consistent with the CWC and the Basin Plan, the Regional Board applies the bacteria objective to all ground waters designated as municipal or domestic supply (MUN), not just those waters currently used for MUN.
16. State Board Resolution No. 88-63 (Adoption of Policy Entitled “Sources of Drinking Water”) defines all groundwaters of the State to be suitable or potentially suitable for MUN uses, and states that they should be designated as MUN in basin plans unless at least one the following three criteria are satisfied:
  - a. The total dissolved solids concentration of the resource exceeds 3,000 mg/L (5,000 umhos/cm, electrical conductivity) and it is not reasonably expected by the Regional Board to supply a public water system, or
  - b. There is contamination, either by natural processes or human activity (unrelated to a specific pollution incident), that cannot reasonably be treated for domestic use using either Best Management Practices or best economically achievable treatment practices, or

- c. The water source does not provide sufficient water to supply a single well capable of producing an average sustained yield of 200 gallons per day, or
- d. The aquifer is regulated as a geothermal energy producing source or has been exempted administratively pursuant to 40 CFR, Section 146.4 for the purpose of underground injection of fluids associated with the production of hydrocarbon or geothermal energy, provided the fluids do not constitute a hazardous waste under 40 CFR Section 261.3

Accordingly, the Regional Board designated all groundwaters as suitable or potentially suitable for MUN in the Basin Plan (pages II-2.00 and -3.00). Regardless of the data that a discharger or other interested party may provide supporting a determination that groundwater within a particular area should be excepted from the MUN designation, the Regional Board can only “de-designate” a particular resource through amendment of the Basin Plan.

- 17. State Board Order No. WQO-2003-0014 upheld the Regional Board’s interpretation of the Basin Plan with respect to implementation of the bacteria objective, stating: *“The Basin Plan contains a water quality objective for bacteria that applies to groundwater that states: ‘In groundwaters used for domestic or municipal supply (MUN) the most probable number of coliform organisms over any seven-day period shall be less than 2.2/100 ml’. Since the groundwater is designated for municipal or domestic supply, a groundwater limitation for coliform of less than 2.2 MPN/100ml is appropriate.”*
- 18. Quantifying narrative water quality objective requires a site-specific evaluation of each waste constituent for consistency with the narrative objective using the translation procedures set forth in the Basin Plan. These procedures require the consideration of, among other things, site-specific hydrogeologic and land use factors and relevant numerical criteria and guidelines developed or published by other agencies and organizations. The latter include the National Academy of Sciences, the University of California Cooperative Extension, and the Food and Agricultural Organization of the United Nations. Westcot and Ayers in a 1985 publication (“Water Quality for Agriculture, Food and Agriculture Organization of the United Nations — Irrigation and Drainage Paper No. 29,” or *Water Quality for Agriculture*) provide detailed information to evaluate the quality of irrigation water necessary to sustain various crops. This publication is clear that considerable judgment should be used in applying the criteria and that appropriate irrigation management and crop variety selection can overcome some of the adverse impact where high water quality is not an option.
- 19. Based on climate, soil type, and natural background water quality, crops sensitive to salt and boron might be capable of being grown in the area, and changing market conditions could drive a change in current cropping patterns.
- 20. The major constituents of concern in assessing the quality of water for agriculture are salinity (expressed as EC or TDS), boron, chloride, and sodium. In general, animal uses are less sensitive than crops for these constituents. Salinity reduces crop growth by reducing the ability of plant roots to absorb water. The salt tolerance of crops also depends on the

frequency and type of irrigation (e.g., drip, furrow, or sprinkler irrigation). Sprinkler irrigation has the greatest impact due to foliar absorption of salt. Absorption and foliar injury are further influenced by high temperature, low humidity, and drying winds, type of sprinkler, and timing of irrigation. Boron is an essential element but can become toxic to some plants when concentrations in water even slightly exceed the amount required for optimal growth. Like salt tolerance, boron tolerance varies with the climate, the soil, and the crop. While boron sensitivity appears to affect a wide variety of crops, sodium and chloride toxicities are mostly limited to tree crops and woody perennials (e.g., citrus, stone-fruit, and vineyard). A predominance of sodium relative to other ions in irrigation water may disperse soil aggregates, which in turn, affects virtually all crops by decreasing the permeability of the soil by water and air.

21. *Water Quality for Agriculture* provides general salt tolerance guidelines for many common field, vegetable, forage, and tree crops. Yield reductions in nearly all crops are not evident when irrigating with water having an EC of less than 700  $\mu\text{mhos/cm}$ . There is, however, an eight- to ten-fold range in salt tolerance of agricultural crops. It is possible to achieve full yield potential with waters having EC up to 3,000  $\mu\text{mhos/cm}$  if the proper leaching fraction is provided to maintain soil salinity within the tolerance of the crop.
22. 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 currently grown in the area.
23. With respect to specific-ion toxicity, *Water Quality for Agriculture* and other similar references indicate that significant reductions in crop yields can be expected if boron content exceeds 0.7 mg/L for boron-sensitive crops (e.g., stone fruit). Similarly, reductions in yields of sodium- and chloride-sensitive crops are not evident when sprinkler irrigated with water containing sodium and chloride concentrations of up to 3 milliequivalents per liter (meq/L) (i.e., 69 mg/L sodium and 106 mg/L chloride). If such crops are not sprinkler irrigated, the maximum concentrations of sodium and chloride associated with no apparent yield reduction may increase, however the extent of the increase is typically crop specific.
24. In the process of crop irrigation, evaporation and crop transpiration remove water from and result in accumulation of residual salts in the soil root zone. These salts would retard or inhibit plant growth except for a fraction of irrigation water applied to leach the harmful salt from the root zone. The leached salts eventually enter ground water and concentrate above the uppermost layer of the uppermost aquifer. As this is the general condition throughout the agricultural Central Valley Region, water supply wells for all beneficial uses typically are constructed to extract groundwater from below this level. This uppermost layer has hydraulic continuity with the remainder of the aquifer.
25. The percolation from irrigated agriculture, with its relatively low and seasonal hydraulic loading rates, is generally dispersed near the groundwater surface. Infiltration from

wastewater irrigation results in reclaimed water intersecting and accumulating on and in the uppermost layer of the uppermost groundwater until dispersed horizontally and vertically into the main mass of the aquifer. Any constituents in the recycled water higher than background groundwater can cause groundwater to be degraded which can be characterized with adequate monitoring. While the assumed application rate of recycled water is comparable to normal irrigation applications (e.g., 4 feet/year), the actual rate may be significantly higher. Accordingly, by virtue of loading, volume, and duration, the discharge has far greater horizontal and vertical impact in the immediate area than a comparable area of irrigated cropland. The extent to which percolating effluent descends into the main mass of the aquifer can be estimated by applying hydrogeologic judgment and is determinable through groundwater monitoring of conservative constituents in the discharge such as chloride or EC.

26. Compliance with groundwater limitations (e.g., nitrogen compounds, bacteria, disinfection and decomposition by-products) has been and should continue to be determined, at a minimum, by means of wells extracting water from first-encountered groundwater. Should the discharge cause elevated concentrations of residual decomposable waste constituents (e.g., total organic carbon) in first-encountered groundwater, deeper monitoring wells may be necessary to provide data to assess the extent to which, if any, decomposition byproducts (e.g., manganese, iron, arsenic) resulting from the microbial attenuation of residual carbon released by the discharge to uppermost groundwater threaten to cause exceedances of water quality limitations deeper in the aquifer.
27. The Basin Plan encourages wastewater recycling wherever feasible and where the opportunity exists to replace an existing use or proposed use of fresh water with recycled water. The use of municipal wastewater for irrigation at agronomic rates will have a comparable impact on groundwater as fresh water extracted and used for irrigation of the same crop with separate wastewater infiltration. Beneficial reuse of wastewater conserves freshwater resources and is encouraged by the Basin Plan and agronomic application rates of wastewater cause comparable impact as widespread freshwater irrigation practices.

#### **Degradation and Groundwater Limitations**

28. State Board Resolution No. 68-16 (“Statement of Policy with Respect to Maintaining High Quality of Waters of the State”) (hereafter Resolution 68-16) requires the Regional Board in regulating the discharge of waste to maintain high quality waters of the State until it is demonstrated that any change in quality will be 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 Regional Board’s policies (e.g., quality that that does not conform to water quality objectives). Resolution 68-16 characterizes “high quality waters” as waters that are of higher quality than that established in policies “as of the date on which such policies become effective.” In addition, Resolution 68-16 requires that discharges of waste to high quality waters “be required to meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to

assure that (a) pollution or nuisance will not occur and (b) the highest water quality consistent with maximum benefit to the people of the State will be maintained.”

29. This Order employs specific terms relating to groundwater quality for regulatory purposes. “Natural background quality,” for the purposes of evaluating compliance with this Order’s groundwater limitations, is defined as the quality of groundwater in the discharge vicinity unaffected by concentrated controllable sources of waste constituents. “Existing natural background quality,” for the purposes of evaluating the discharge’s consistency with Resolution 68 –16, is defined as the quality of natural background groundwater in the discharge vicinity as of 1968. Limited available information and best professional judgment may be sufficient to characterize existing natural background quality.
30. Tertiary Treated Domestic wastewater can still contain constituents such as oxygen demanding substances (i.e., BOD<sub>5</sub>), salinity constituents, pathogens, nutrients (e.g., nitrate), organics, and metals. Discharge to land in a manner that allows waste infiltration and percolation may result in an increase in the concentration of one or more of these constituents in groundwater. To be permissible, any increase in the concentration of these constituents in groundwater must be consistent with the antidegradation provisions of Resolution 68-16.
31. Excessive residual organic carbon in percolating recycled water may result in prolonged periods of oxygen deficiency in groundwater. If recycled water percolating to and mixing with groundwater contains more organic carbon than can be oxidized by microorganisms respiring on the residual oxygen in the recycled water and available in the soil column, the soil and groundwater beneath the recycled water storage ponds will likely become anoxic. Further microbial decomposition of organic carbon in groundwater causes nitrate and oxidized forms of manganese and iron to substitute for oxygen as a terminal electron acceptor, reducing nitrate to nitrogen and transforming manganese and iron to more water-soluble reduced forms. Where groundwater underlying storage ponds of recycled water contain dissolved manganese, iron, and arsenic in elevated concentrations, it likely indicates organic overloading.
32. 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., oxygen-demanding substances, nutrients, bacteria) is inconsistent with Resolution 68-16. Degradation of groundwater by waste constituents in the discharge after subjecting them to effective source control, treatment, and control may be determined consistent with Resolution 68-16, after consideration of reasonableness under the circumstances of the discharge. Some degradation of groundwater by the Discharger is consistent with Resolution 68-16 provided that the degradation is:
  - a. limited in extent;
  - b. restricted to waste constituents characteristic of municipal wastewater and not totally removable by best practicable treatment and control (BPTC) measures;

- c. minimized by fully implementing, regularly maintaining, and optimally operating BPTC measures;
  - d. demonstrated to be consistent with water quality objectives prescribed in the Basin Plan; and
  - e. justified to be consistent with the maximum benefit to the people of California.
33. Degradation of groundwater by constituents in the discharge after effective source control, treatment, and control may be determined consistent with maximum benefit to the people of California. This determination is based on considerations of reasonableness under the circumstances of the municipal discharge. Factors to be considered include:
- a. past, present, and probable beneficial uses of the water (as specified in the Basin Plan);
  - b. economic and social costs, tangible and intangible, of the discharge compared to the benefits;
  - c. environmental aspects of the discharge; and
  - d. implementation of feasible alternative treatment or control methods.
34. The Discharger is aware that their recycled water contains constituents, mainly electrical conductivity or TDS that exceed water quality objectives and therefore, supplying this recycled water to golf courses that use storage ponds for irrigation of their greens could have the potential to degrade the first layer of groundwater. Therefore, it is in the best interest of the Discharger to determine what is the actual background water quality of the first layer of groundwater before proceeding with supplying recycled water to golf courses. This Order, therefore includes a provision that requires the Discharger to conduct a groundwater study that will focus on the worst case area, install monitoring wells, hydropunch systems or equivalent devices to conduct sampling and analysis of groundwater quality and determine the background groundwater quality. Based on the results of the study, the City can then determine whether the use of recycled water will have an impact on groundwater and if so what level of treatment would be required in order to be in compliance with State Board Resolution 68-16.

### **Treatment and Control Practices**

35. The existing WWTP described in Finding 3 provides treatment and control of the discharge that incorporates:
- a. technology for tertiary treatment of municipal wastewater;
  - b. disinfection;



- c. an operation and maintenance manual;
  - d. wastewater reuse; and
  - e. groundwater monitoring.
36. The discharge has the potential to degrade groundwater with nonconservative constituents, depending upon the effectiveness of soil attenuation. The degree of potential groundwater degradation from waste constituents has not been quantified. Based on the known treated effluent concentrations it is possible that degradation of groundwater will occur from the release of waste constituents and that the degradation may eventually cause exceedances of interim groundwater limitations.
37. Provision E7 establishes schedules of tasks to (1) evaluate BPTC for each major storage facility of the recycled water users, (2) characterize groundwater for an expanded list of waste constituents specified in this Order's Monitoring and Reporting Program.
38. This Order represents the first of a two-phase approach to ensure a long-term discharge consistent with Regional Board plans and policies. Economic prosperity of local communities and associated industry is of maximum benefit to the people of California, and therefore sufficient reason exists to accommodate growth and groundwater degradation around proposed reclamation storage ponds and irrigation area, provided that the terms of the Basin Plan are met. It is appropriate that the Discharger assemble the technical information necessary for the Regional Board to determine consistency with its plans and policies. During the schedule set forth herein as reasonable for Phase 1, the Discharger must:
- a. Conduct a hydrogeologic investigation of the area affected by the discharge.
  - b. Perform a comprehensive evaluation of the WWTP 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. Evaluate and propose, with supporting documentation, the appropriate level of degradation that complies with Resolution 68-16.
39. Following the completion of Phase 1 tasks, evidence submitted by the Discharger will be evaluated and this Order will be reopened to consider final terms of discharge consistent with Resolution 68-16. These include waste-specific groundwater limitations based on information provided by the Discharger that reflect full implementation of BPTC and compliance with the most stringent applicable water quality limitations for that waste constituent.

40. Until the work required in Phase 1 is completed by the Discharger and reviewed by the Regional Board, it is reasonable that interim ground water limitations directly implement Basin Plan water quality objectives. These groundwater limitations will not unreasonably threaten present and anticipated beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan. Where the stringency of the criterion for the same waste constituent differs according to beneficial use, the most stringent criterion applies as the governing limitation for that waste constituent.
41. CWC Section 13241 requires the Regional Board to consider various factors, including economic considerations, when adopting water quality objectives into its Basin Plan. CWC Section 13263 requires the Regional Board to address the factors in Section 13241 in adopting waste discharge requirements. The State Board, however, has held that a Regional Board need not specifically address the Section 13241 factors when implementing existing water quality objectives in waste discharge requirements because the factors were already considered in adopting water quality objectives. The interim groundwater limitations implement adopted water quality objectives in the manner prescribed by the Basin Plan. No additional analysis of Section 13241 factors is required.
42. This Order establishes interim groundwater limitations for the recycled water that will not unreasonably threaten beneficial uses or result in groundwater quality that exceeds water quality objectives set forth in the Basin Plan. As interim groundwater limitations, the Phase 1 limitations are conditional, temporary, and convey no entitlement. Tasks assure that BPTC and the highest water quality consistent with the maximum benefit to the people of the State will be achieved prior to implementing the second phase (see finding No. 48 for explanation of phase II). Accordingly, the discharge as authorized herein is consistent with the antidegradation provisions of Resolution 68-16.

### **General Findings**

43. 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.
44. CWC Section 13267(b) provides 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 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 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 these reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify evidence that supports requiring the person to provide the reports

45. The technical reports and the monitoring and reporting program required by this Order are necessary to assure compliance with these waste discharge requirements. The Discharger operates the WWTP that discharges the waste subject to this Order, and is, therefore, subject to CWC Section 13267(b).
46. The California Department of Water Resources set standards for the construction and destruction of groundwater wells, as described in *California Well Standards Bulletin 74-90* (June 1991) and *Water Well Standards: State of California Bulletin 94-81* (December 1981). These standards, and any more stringent standards adopted by the State or county pursuant to CWC section 13801, apply to all monitoring wells.
47. State regulations that prescribe procedures for detecting and characterizing the impact of waste constituents from waste management units on groundwater are found in Title 27. While the WWTP is exempt from Title 27, the data analysis methods of Title 27 may be appropriate for determining whether the discharge complies with the terms for protection of groundwater specified in this Order.
48. The Discharger proposes to distribute recycled water in a two phase approach, with phase I allowing the use of recycled water for surface irrigation of park areas, and median vegetation as shown and listed in Attachment A, and for industrial purposes such as street sweeping and dust control and compaction for constructions, and for making concrete. Phase II will address the storage of recycled water in impoundment areas for irrigation of golf courses and will be pursued upon completion of a groundwater study that will allow the City to make a more informed decision as to how to proceed with the use of recycled water in order to be consistent with State Board Resolution No. 68-16. The proposed surface impoundment recycled water users include the Roddy Ranch Golf course, the Brentwood Country Club Golf course, the SunCal Company Golf course, and the Shadow Lakes/Brookfield Homes Golf course as shown in Attachment A.

The Discharger's intent is to supply recycled water to the golf courses via the Roddy Ranch Pump Station. The recycled water will be blended at a 1 to 3 ratio with non-potable surface water from the Eastern Contra Costa County Irrigation District, and then pumped to the individual golf courses.

49. The State Legislature established the California Recycled Water Task Force (Task Force) in 2001 to evaluate the current framework of State and local rules, regulations, ordinances and permits to identify opportunities for and obstacles to the same use of recycled water in California. In June 2003, the Task Force completed its review and issued its final report, titled "Water Recycling 2030, Recommendations of California's Recycled Water Task Force." Recommendation 4.2.1 of the report states that the State Board should convene a committee to review the legal requirements of Federal and State statutes and regulations that relate to the regulation of incidental runoff of recycled water to determine the regulatory and enforcement options that are available to the regional boards. Following a stakeholder process and internal review, on 24 February 2004 the Executive Director issued a

memorandum providing guidance on regulation of recycled runoff and discharges of recycled water from ponds. The memorandum states, in part:

“Recycled water ponds should be designed and operated not to spill during the dry months. Spill should be prohibited during these times. Generally, wet weather regulatory strategies that do not require individual NPDES Permits fall within the following categories:

1. The recycled water pond is designed not to spill during wet months. Under this circumstance, spills that occur under extreme weather conditions or emergencies should not be considered for enforcement.
  2. Recycled water ponds can be drained and refilled with potable water or flushed with potable water prior to the onset of the wet season. Flushing will not displace all of the recycled water but the water quality threat is minimal.
  3. Recycled water ponds designed to spill recycled water during the wet season can be regulated under Phase I municipal storm water permits or under a general storm water permit. These permits require reduction of pollutants to the maximum extent practicable. The permit also incorporate receiving water limitations requiring the implementation of an iterative process for addressing any exceeding of water quality objectives.”
50. The golf courses may contain numerous hills and sloped areas that would promote runoff unless closely managed during irrigation. In addition, the golf courses may use ponds to store the recycled water and during wet weather may overflow and enter surface waters. Such runoff cannot occur except under an NPDES permit, and the Discharger and user is required to provide all runoff controls necessary to keep wastewater irrigation runoff out of drainage channels or surface waters and within the boundaries of each golf course property. However, Golf courses that have incidental runoff and operate their ponds in accordance with one of the operational procedures cited in the 24 February memorandum as described in the above finding, will not require an individual NPDES permit.
51. Residences and snack areas may be built adjacent to the golf courses’ greens. This Order requires compliance with Section 60310 of Title 22, CCR, which prohibits spray, mist, or runoff of recycled water from entering dwellings, outdoor eating areas, or food handling facilities.
52. For dual plumbed systems, prior to initiating effluent recycling, the Discharger must install reduced pressure principle and air gap devices to prevent cross connections between the two water supplies.
53. Uses of recycled water other than those identified in Title 22 are not regulated by this Order. Any other uses of recycled water will be regulated under individual Waste Discharge Requirements.

54. Bypasses and overflows of partially treated and untreated wastewater are prohibited under this Order. The Discharger however, has the ability under Order No. 5-00-171 to discharge undisinfected secondary treated effluent to effluent disposal ponds located on the City's Wastewater Treatment Plant site. The discharge of recycled water to surface waters is also prohibited except as allowed under Order No. 5-00-171 or if it occurs as incidental runoff consistent with operations cited in the 24 February memorandum as described in Finding No. 49 of this Order. All necessary measures must be taken to eliminate discharges to surface waters and assure compliance with Waste Discharge Requirements.
55. Recycled water is a waste and, as such, any discharge to surface water must be regulated under the National Pollutant Discharge Elimination System (NPDES). Recycled Water Prohibitions have been included in this Order to assure that: recycled water is not discharged to surface waters unless it is of an incidental nature; the by-pass or overflow of untreated or partially treated reclamation water is prohibited; excessive irrigation does not result in excessive runoff; over spray or runoff is minimized; and, recycled water is not used within 50 feet of any well used for domestic water supply.
56. On 6 January 1977, the State Water Resources Control Board (State Board) adopted Resolution No. 77-1, *Policy with Respect to Water Reclamation in California*, which resolved to encourage water reclamation projects that replace or supplement the use of fresh water.
57. In 1996, the State Board and the DHS set forth principles, procedures, and agreements to which the agencies committed themselves, relative to the use of recycled water in California, in a document titled *Memorandum of Agreement Between the Department of Health Services and The State Water Resources Control Board On The Use of Reclaimed Water* (MOA, 20 February 1996). This Order is consistent with the MOA.
58. Recycled Water Limitations have been included in this Order to assure compliance with requirements contained in Title 22 and the DHS - State Board MOA.
59. DHS requires that the American Water Works Association (AWWA) *Guidelines for Distribution of Non-Potable Water and Guidelines for the On-site Retrofit of Facilities Using Disinfected Tertiary Recycled Water* be implemented in design and construction of reclamation equipment. The guidelines require installation of purple pipe, adequate signs, and adequate separation between the recycled water lines and domestic water lines and sewer lines. The Discharger shall fully comply with these requirements.
60. The Discharger certified a final Environmental Impact Report (EIR) in November 1998 in accordance with the California Environmental Quality Act (CEQA)(Public Resources Code Section 21100, et seq.) for the City's wastewater treatment facility prior to adoption of WDRs Order No. 5-00-171. The Regional Board considered the EIR, and as part of mitigating significant impacts on water quality, adopted Order No. 5-00-171 and encouraged maximum reclamation of treated effluent via unrestricted landscape irrigation, conducted in accordance with Water Recycling Requirements and a Master Reclamation Plan.

Furthermore, the Discharger has prepared an Initial Study/Mitigated Negative Declaration (IS/MND) for the proposed City's Capital Improvement Program 2003-2008, which includes non-potable (recycled) water distribution system projects. The Regional Board has reviewed the CEQA documents and concurred that the reclamation projects will not result in significant impacts to water quality.

61. Section 60303 of Title 22 states that water reclamation requirements shall not apply to the use of recycled water onsite at a water reclamation plant, or wastewater treatment plant, provided access by the public to the area of onsite recycled water use is restricted.
62. Section 60323(a) of Title 22 states that no person shall produce or supply recycled water for direct reuse from a proposed reclamation plant unless an engineering report is submitted for review and approval by DHS. A Title 22 Engineering Report was submitted to DHS on 18 September 2000. DHS provided comments on the Title 22 Report, and on January 2003, a revised Title 22 report that reflects the existing and future reclamation system uses was submitted addressing DHS's concerns. DHS reviewed the revised report and did not provide additional comments.
63. This use of recycled water is exempt from the requirements of Title 23, CCR, section 2510, et seq. (hereafter Chapter 15) and Title 27, CCR, pursuant to Section 2511(b) based on the following:
  - a. The Regional Board is issuing a Master Reclamation permit, and
  - b. The reclamation complies with the Basin Plan, and
  - c. The recycled water does not need to be managed according to 22 CCR, Division 4.5, Chapter 11, as a hazardous waste.
64. The attached Monitoring and Reporting Program No. R5-2004-0132, Information Sheet, and Attachments A through C are part of this Order
65. The Regional Board has notified the Discharger and interested agencies and persons of its intent to prescribe reclamation requirements and has provided them with an opportunity for a public hearing and an opportunity to submit their written views and recommendations.
66. The Regional Board, in a public meeting, heard and considered all comments pertaining to the proposed reclamation permit.
67. Any person adversely affected by this action of the Regional Board may petition the State Board to review the action. The petition must be received by the State Water Resources Control Board, Office of the Chief Counsel, P.O. Box 100, Sacramento, CA, 95812-0100, within 30 days of the date on which this action was taken. Copies of the law and regulations applicable to filing petitions will be provided on request.

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

**A. Recycled Water Prohibitions**

1. The discharge of recycled water to surface waters is prohibited. However, the incidental discharge of recycled water to waters of the State is not a violation of this Order if the incidental discharge does not unreasonably affect the beneficial uses of the receiving water, and does not result in exceeding an applicable water quality objective in the receiving water.
2. The discharge of recycled water from impoundment areas (golf course's ponds) to surface waters or tributaries to surface waters, shall not be in violation of this Order provided the irrigation system was operated in accordance with one of the operational strategies described in Finding No. 49, above.
3. By-pass or overflow of untreated or partially treated recycled water from the wastewater treatment plant, any intermediate unit processes, or the reclamation distribution system to the point of use is prohibited.
4. Excessive irrigation with recycled water that results in excessive runoff of recycled water, or continued irrigation of recycled water during periods of rain is prohibited. Overspray or runoff associated with normal sprinkler use shall be minimized.
5. Application of recycled water within 50 feet of any well used for domestic water supply is prohibited, unless approved by the Department of Health Services Drinking Water Branch.
6. Impoundment of recycled water within 100 feet of any well used for domestic water supply is prohibited.
7. Use of recycled water, such as washing streets that is conducted without using proper Best Management Practices and that would result in either direct or indirect discharges to surface waters or a surface water drainage course is prohibited.
8. Spray irrigation with recycled water when wind velocities exceed 30 mph is prohibited.
9. 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.

10. The use of recycled water shall not cause pollution or a nuisance as defined by Section 13050 of the California Water Code (CWC)

**B. Recycled Water Limitations**

1. The tertiary recycled water shall, at a minimum, be adequately oxidized, coagulated, filtered, and disinfected, and shall not exceed the following limits:

<u>Constituents</u>	<u>Units</u>	<u>Monthly Average</u>	<u>Weekly Average</u>	<u>7-day Median</u>	<u>Daily Maximum</u>
BOD <sup>1,2</sup>	mg/l	10	15		20
TSS <sup>2</sup>	mg/l	10	15		30
Total Coliform	MPN/100ml			2.2	23 <sup>3</sup>
Turbidity <sup>4</sup>	NTU				2 (5) <sup>4</sup>

<sup>1</sup> 5-day, 20°C biochemical oxygen demand (BOD).

<sup>2</sup> To be ascertained by a 24-hour composite.

<sup>3</sup> In a 30-day period, only a single sample may exceed 23 MPN/100ml and no sample should exceed 240 MPN/100ml.

<sup>4</sup> Turbidity shall not exceed 5 NTUs 5% of the time or 10 NTUs at any given time, and the daily average turbidity must not exceed 2 NTUs.

2. Disinfection of tertiary treated wastewater shall be accomplished by a chlorine disinfection process following filtration that provides a CT value (the product of total chlorine residual concentration and modal contact time measured at the same point) of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak dry weather design flow.
3. Disinfected tertiary treated wastewater for unrestricted use shall be continuously sampled for turbidity using a continuous turbidity meter and recorder at a point prior to filtration and again following filtration. Turbidity measurements shall be based on a reading and recording of the turbidity strip charts or computer records at four-hour intervals at least once per day. Compliance with the daily average operating turbidity shall be determined by averaging the results of all four-hour turbidity samples read during the day. The results of the daily average turbidity determinations shall be reported monthly to the Regional Board. Recycled water in excess of the turbidity limits shall not enter the reclamation distribution system. An automated recycled water distribution system bypass is required to assure that water in excess of the turbidity limit does not enter the system.
4. Water in the surface layer of any pond or earthen reservoir containing recycled water shall meet the following limitations at all times:



- a. Dissolved oxygen shall not be less than 1.0 mg/l.
- b. pH shall not be less than 6.0 or greater than 9.0.
- c. Except for decorative ponds, the freeboard shall not be less than 2-feet.

**C. Recycled Water Specifications**

1. Application of recycled water shall be confined to the designated land application areas as defined in this Order and specified in the Discharger's Master Reclamation Plan that is subject to approval by the Regional Board and the DHS.
2. The use of recycled water shall not cause degradation of any water supply unless in conformance with State Board Resolution No. 68-16
3. Recycled water shall be managed in conformance with the regulations contained in Title 22, Division 4, Chapter 3, CCR.
4. Recycled water shall be in compliance with Title 22, Article 3 ("Uses of Recycled Water").
5. In design and construction of reclamation equipment, the American Water Works Association (AWWA) *Guidelines for Distribution of Non-Potable Water and Guidelines for the On-site Retrofit of Facilities Using Disinfected Tertiary Recycled Water* shall be implemented. All reclamation equipment, pumps, piping, valves, and outlets shall be appropriately marked to differentiate them from potable facilities. All reclamation distribution system piping shall be purple or adequately wrapped with purple tape.
6. Public contact with recycled water shall be controlled through use of fences and cautionary signs, and/or other appropriate means. Perimeter warning signs indicating that recycled water is in use shall be posted at least every 500 feet along the property boundary, at each corner, and at each access road entrance to the irrigation area, including golf cart paths. The size and content of those signs shall be as described in Section 60310 of Title 22. Each sign shall be in English and Spanish languages. Additionally, recycled water controllers, valves, and similar appurtenances shall be affixed with recycled water warning signs, and shall be equipped with removable handles or locking mechanisms to prevent public access or tampering.
7. Recycled water shall not be allowed to escape from the authorized use areas by airborne spray or by surface flow except in minor amounts such as that associated with good irrigation practices. However, direct or windblown spray of recycled water shall be prevented from entering outdoor eating areas, dwellings, drinking water facilities, food handling facilities, and other locations where the public may be present.
8. Irrigation runoff from the golf courses including overflow from recycled water

storage ponds shall be completely contained within the designated golf course irrigation area, and shall not pond in any area accessible to the public, or enter any drainage course or surface waters, unless it is incidental and does not unreasonably affect the beneficial uses of the receiving water or it occurs during the wet season with the storage ponds being operated in accordance with one of the operational strategies described in Finding No. 49 of this Order.

9. Irrigation with recycled water shall not be performed during or within 24 hours after any precipitation event, or when the ground is saturated.
10. Application of recycled water to the reclamation areas shall be at reasonable rates considering the crop, soil, climate, and irrigation management system. The nutrient loading of the reclamation areas, including nutritive value of organic and chemical fertilizers and of the recycled water shall not exceed the crop demand.
11. Any person who, without regard to intent or negligence, causes or permits an unauthorized discharge of 50,000 gallons or more of recycled water that has been treated to at least disinfected tertiary 2.2 recycled water, in or on waters of the state, shall, as soon as (1) that person has knowledge of the discharge, (2) notification is possible, and (3) notification can be provided without substantially impeding cleanup or other emergency measures, immediately notify the Regional Board in accordance with reporting requirements in Standard Provision F.6.
12. A minimum freeboard of two (2) feet shall be maintained at all times in any reservoir or pond containing recycled water, except decorative ponds or with prior written authorization by the Regional Board's Executive Officer.
13. All reservoirs and ponds as practical as possible shall be adequately protected from erosion, washout and flooding from a rainfall event having a predicted frequency of once in 100 years.
14. There shall be at least a ten foot horizontal and one foot vertical separation at crossings between all pipelines transporting recycled water and those transporting domestic supply, with the domestic supply above the recycled water pipeline, unless approved by the DHS.
15. There shall be no cross-connection between potable water supply and piping containing recycled water. Supplementing recycled water with potable water shall not be allowed except through an air-gap separation, or if approved by the DHS, a reduced pressure principle backflow device.
16. Areas irrigated with recycled water shall be managed to prevent ponding and conditions conducive to the proliferation of mosquitoes and other disease vectors, and to avoid creation of a public nuisance or health hazard. The following practices shall be implemented, at a minimum:

- a. Irrigation water must infiltrate completely within a 48-hour period.
  - b. Ditches receiving irrigation runoff, not serving as wildlife habitat, shall 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.
17. The recycled water piping system shall not include any hose bibs, except at the treatment plant, and with appropriate signage. Quick couplers and sprinkler heads, if used, shall be of a type, or secured in a manner, that permits operation only by authorized personnel.

**D. Ground Water Limitations**

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

1. Total coliform organisms of 2.2 Most Probable Number per 100 mL over any seven-day period.
2. Chemical constituents in concentrations that adversely affect beneficial uses, including:
  - a. Constituent concentrations listed below:

<u>Constituent</u>	<u>Units</u>	<u>Limitation</u>
EC	µmhos/cm	700
Total Dissolved Solids <sup>1</sup>	mg/L	450
<u>Total Nitrogen</u>	<u>mg/L</u>	<u>10</u>

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

- b. For constituents identified in Title 22 (refer to Finding 14 — except chloride, EC and Total Dissolved Solids — that are present in the discharge, the concentrations in the discharge or the Title 22 MCLs, whichever is more stringent. Limitations for individual constituents may be below MCLs to satisfy Groundwater Limitations D.2.c and D.2.d.

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

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

- d. Taste- or odor-producing constituents in concentrations that cause nuisance or adversely affect beneficial uses, including, but not limited to, ammonia and ammonium ion as  $\text{NH}_4$  in excess of 0.5 mg/L.
3. Exhibit pH of less than 6.5 or greater than 8.4 pH units.

**E. Provisions**

1. The California Health and Safety Code, Division 104 Environmental Health, Section 116815, requires that “all pipes installed above or below the ground, on or after June 1, 1993, that are designed to carry recycled water, shall be colored purple or distinctively wrapped with purple tape.” There are indications that some of the proposed users of recycled water (i.e.: existing golf courses) have not utilized purple pipe or have not used the alternative method of distinctly wrapping with purple tape as required in Recycled Water Specification No. 5, throughout the reclamation distribution system. Users of recycled water whose current conveyance pipes do not comply with California Health and Safety Code, Division 104 Environmental Health, Section 116815 with the approval from the DHS may provide an alternative form of identification, such as signs. In addition, black pipe commonly used to deliver recycled water to individual plants via a drip irrigation system may also be used in lieu of purple pipe or pipe wrapped with purple tape pipe. The Discharger, therefore, upon approval from DHS and prior to implementation of phase II, shall submit a report demonstrating compliance with DHS regulations.
2. The Discharger shall develop administrative procedures and User Agreements requiring compliance with Title 22 criteria and this Order. Upon approval of the Discharger’s procedures and Agreements, the Discharger may authorize specific additional reclamation projects on a case-by-case basis in accordance with the approved program and Agreements.
3. The Discharger shall be responsible for ensuring that recycled water meets the quality standards of this Order and for the operation and maintenance of transport facilities and associated appurtenances. The Discharger shall hold the Users responsible for the application and use of recycled water on their designated use areas and associated

operations and maintenance in accordance with all applicable Title 22 requirements and this Order.

4. In accordance with California Business and Professions Code Sections 6735, 7835, and 7835.1, engineering and geologic evaluations and judgments shall be performed by or under the direction of registered professionals competent and proficient in the fields pertinent to the required activities. All technical reports specified herein that contain workplans for investigations and studies, that describe the conduct of investigations and studies, or that contain technical conclusions and recommendations concerning engineering and geology shall be prepared by or under the direction of appropriately qualified professional(s), even if not explicitly stated. Each technical report submitted by the Discharger shall contain a statement of qualifications of the responsible licensed professional(s) as well as the professional's signature and/or stamp of the seal.
5. All of the following reports shall be submitted pursuant to Section 13267 of the California Water Code and shall be prepared as described in Provision E4.
  - a. At least **60 days prior** to distributing recycled water to each user, the Discharger shall submit for approval to the Regional Board and DHS **Rules and Regulations for Recycled Water Users** governing the design and construction of recycled water use facilities and the use of recycled water. Rules and regulations shall, at a minimum, include the requirements that are contained in Attachment B of this Order.
  - b. At least **60 days prior** to distributing recycled water to each user, the Discharger shall submit a program to conduct compliance inspections of recycled water reuse sites. The inspection program shall include at a minimum an **Irrigation System Inspection plan** detailing the procedures and schedule for regular inspections designed to ensure that sprinkler heads and other system elements are functioning properly to minimize incidental runoff during irrigation, and prevent potential surface water discharges of recycled water via the irrigation system. The plan shall include as-built irrigation system plans that highlight sprinkler heads located along streets, property boundaries, areas adjacent to surface water courses, and areas adjacent to any water hazards. It shall include specific procedures for inspections and system adjustments or modifications to be made immediately upon discovery of any malfunction that threatens to cause a violation of this Order. The inspections shall determine the status of compliance with the Discharger's approved Rules and Regulations for Recycled Water Users.
  - c. At least **60 days prior** to distributing recycled water to each user, the Discharger shall submit a **User report** containing a detailed description of each reuse site identifying all of the following information:

- 1) The site location, the County Assessor Parcel Number(s), the name of the property owner, the name of the user, and a copy of the long-term agreement between the Discharger and the user for the use of recycled water.
- 2) The number, location, and type of facilities within the recycled water use area proposing to use domestic and recycled water. "Facility" means any type of building or structure, or defined area of specific public use that utilizes or proposes to utilize a dual plumbed system.
- 3) The average number of persons estimated to be served at each use area on a daily basis.
- 4) The specific type, area, topography, and boundaries of the proposed use site area including a map, showing the location of each facility, drinking water fountain and impoundment to be served. The anticipated volume of recycled water to be used.
- 5) The person or persons responsible for operation of the recycled water system at each use area.
- 6) The specific use to be made of the recycled water at each use area. The recycled water management facilities and operations plan, reflecting consultation with state and local health departments, and explaining in detail how compliance with the User Reclamation Plan, Title 22 criteria, and the requirements of this Order will be achieved.
- 7) The methods to be used by the Discharger to assure that the installation and operation of the recycled system will not result in cross connections between the recycled water piping system, the potable water piping system, and other auxiliary non-potable water sources. This shall include a description of pressure, dye or other test methods to be used to test the system.
- 8) Plans and specifications shall include the following:
  - (a) Proposed piping system to be used,
  - (b) Pipe locations of the recycled, potable and auxiliary non-potable systems,
  - (c) Type and location of the outlets and plumbing fixtures that will be accessible to the public,
  - (d) The methods and devices to be used to prevent backflow of recycled water into the public water system,

- (e) Plan notes relating to recycled water specific installation and use requirements
6. Depending on the background water quality of groundwater, impoundments (golf course's ponds) and large scale irrigation projects (golf courses and large parks) utilizing recycled wastewater may have a potential to impact the beneficial uses of groundwater. The Discharger therefore before proceeding with phase II of the use of recycled water shall conduct a **groundwater quality study** of first groundwater using the following methodology:
- a. Determine location of worst case groundwater conditions. Worst case for this purpose is defined as the location in which the groundwater has minimal assimilative capacity to absorb wastewater constituents from the application of recycled water and still maintain water quality objectives below acceptable criteria. An example of worst case, using TDS as a constituent, is groundwater at or just below the MCL of 500 mg/l. An effluent with a TDS concentration much higher than 500 would therefore have a potential to cause a violation of the TDS water quality criterion.
  - b. Gather groundwater data from potential water reclamation use areas and submit a technical report of the site with the worst case groundwater conditions. Upon approval by the Regional Board of concurrence of worst case groundwater conditions, submit a monitoring well network workplan (in accordance with Attachment C) to study the worst case area.
  - c. Perform quarterly sampling for a minimum of 4 consecutive quarters for constituents prescribed in the groundwater monitoring of Monitoring and Reporting Program No. R5-2004-0132.
  - d. Submit analytical results in a final report along with the City's decision whether or not to proceed with Phase II and as necessary evaluate what additional measures or level of treatment may be required to comply with State Board Resolution 68-16.

The Discharger shall comply with the following compliance schedule in implementing the work required by this Provision:

<u>Task</u>	<u>Compliance Date</u>
Submit groundwater evaluation report	<b>1 December 2004</b>
Submit Network Workplan	<b>1 March 2005</b>
Commence Groundwater Study	<b>1 June 2005</b>
Complete Groundwater Study	<b>1 June 2006</b>
Submit Technical Report and results	<b>1 July 2006</b>

7. **BPTC Evaluation Tasks.** The Discharger, prior to implementing Phase II, shall propose a work plan and schedule for a systematic and comprehensive technical evaluation of each storage facility that contains recycled water, 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, lining of ponds, need for 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:

<u>Task</u>	<u>Compliance Date</u>
Submit workplan and schedule for BPTC Evaluation	<b>1 June 2005</b>
Commence BPTC Evaluation	<b>1 September 2006</b>
Complete BPTC Evaluation	<b>1 September 2007</b>
Submit technical report: Evaluation results	<b>1 November 2007</b>

8. The Discharger shall conduct periodic inspections of the User's facilities and operations to monitor and assure compliance with conditions of the Discharger's permit and this Order. The Discharger shall take whatever actions are necessary, including termination of delivery of recycled water to the User, to correct any User violations. The Discharger shall maintain a right-of-entry for all properties where recycled water is used and shall conduct regular inspections to assure cross connection are not made with potable water systems and air-gap devices are installed and operable. The Discharger shall produce, maintain and comply with Engineer's Reports, in accordance with Title 22, Sections 60323 and 60314, which must be approved by the DHS.



9. If, in the opinion of the Executive Officer, reclamation at proposed new locations cannot be adequately regulated under this Order, a Report of Waste Discharge may be requested and individual Water Reclamation Requirements may be issued.
10. In the event the Discharger does not comply or will be unable to comply for any reason, with any prohibition, limitation, and specification, the Discharger shall notify the Regional Board by telephone within 12 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within five days, unless the Regional Board waives confirmation. The written notification shall state the nature, time, duration, and cause of noncompliance, and shall describe the measures being taken to remedy the current noncompliance and, prevent recurrence including, where applicable, a schedule of implementation. In the event the **Discharger** does not comply or will be unable to comply for any reason, with any prohibition, limitation, and specification, the Discharger shall notify all recycled water users as soon as is reasonably possible. In the event the **recycled water users** violate or cause violation of any prohibition, limitation, and specification, the Discharger, upon learning of such violation, shall notify the Regional Board by telephone within 12 hours of having knowledge of such noncompliance, and shall confirm this notification in writing within five days, unless the Regional Board waives confirmation.
11. The Discharger shall comply with the Monitoring and Reporting Program No. R5-2004-0132, which is part of this Order, and any revisions thereto as ordered by the Executive Officer.
12. The Discharger shall comply with all applicable requirements for Dischargers in the "Standard Provisions and Reporting Requirements for Waste Discharge Requirements," dated 1 February 2004, which are by reference a part of this Order. This attachment and its individual paragraphs are commonly referred to as "Standard Provision(s)."
13. The Discharger must comply with all conditions of this Order, including timely submittal of technical and monitoring reports as directed by the Executive Officer. 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.
14. The Discharger shall comply with the criteria established in Title 22. Uses of recycled water other than those identified in Title 22 are not regulated by this Order, are to be considered on a case-by-case basis and will be regulated under a separate Order.
15. The Regional Board will review this Order periodically and will revise requirements when necessary.

MASTER RECLAMATION PERMIT ORDER NO. R5-2004-0132  
CITY OF BRENTWOOD.  
WASTEWATER TREATMENT PLANT  
CONTRA COSTA COUNTY

-26 -

I, THOMAS R. PINKOS, Executive Officer, do hereby certify the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, Central Valley Region, on 10 September 2004.

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THOMAS R. PINKOS, Executive Officer

RDJ

CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD  
CENTRAL VALLEY REGION

MONITORING AND REPORTING PROGRAM NO. R5-2004-0132

FOR  
THE CITY OF BRENTWOOD  
MASTER RECLAMATION PERMIT  
WASTEWATER TREATMENT PLANT  
CONTRA COSTA COUNTY

This Monitoring and Reporting Program is issued pursuant to Water Code Section 13267. The Discharger shall not implement any changes to this Program unless and until the Regional Board issues a revised Monitoring and Reporting Program. For purposes of evaluating compliance with the limitations of Order No. R5-2004-0132, the Discharger shall conduct monitoring and submit reports as specified below. Specific sample station locations shall be established under direction of the Regional Board's staff, and a description of the stations shall be attached to this Order.

Section 13267 of the California Water Code states, in part, “(a) A regional board, in establishing...waste discharge requirements...may investigate the quality of any waters of the state within its region” and “(b)(1) In conducting an investigation..., the regional board may require that any person who... discharges... waste... that could affect the quality of waters within its region shall furnish, under penalty of perjury, technical or monitoring program reports which the regional board requires.” This Monitoring and Reporting Program to monitor recycled wastewater and underlying groundwater required by Order No. R5-2004-0132 is necessary to assure compliance with Order No. R5-2004-0132. The Discharger operates the facility that discharges waste subject to Order No. R5-2004-0132.

**RECYCLED WATER SUPPLY MONITORING**  
**Brentwood’s WWTP Tertiary Treated effluent**

Samples shall be collected after the final wastewater treatment processes (tertiary treated effluent) prior to entering the recycling distribution system. Samples need only be collected during periods of time recycled water is pumped off-site. Recycled Water Supply monitoring shall include at least the following:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Flow	mgd	Meter	Continuous
Turbidity <sup>1</sup>	NTU	Meter	Continuous
Total Chlorine Residual <sup>2</sup>	mg/l	Meter	Continuous
Total coliform organisms <sup>3</sup>	MPN/100 ml	Grab	Daily
pH	pH units	Grab	Daily
Electrical Conductivity	µmhos/cm	Grab	Daily

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Ammonia (as N)	mg/l	Grab	Weekly
Nitrate (as N)	mg/l	Grab	Weekly
20°C BOD <sub>5</sub>	mg/l, lbs/day	24-hr. Composite	Weekly
Total Suspended Solids	mg/l, lbs/day	24-hr. Composite	Weekly
Total Dissolved Solids (TDS)	mg/l	Grab	Monthly
Boron	mg/l	Grab	Quarterly
Chloride	mg/l	Grab	Quarterly
Phosphorus	mg/l	Grab	Quarterly
Sodium	mg/l	Grab	Quarterly

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- <sup>1</sup> The turbidity shall be continuously recorded. The recorded charts shall be maintained by the Discharger for at least five years. Disinfected tertiary treated wastewater for unrestricted use shall be continuously sampled for turbidity using a continuous turbidity meter and recorder at a point prior to filtration and again following filtration. Turbidity measurements shall be based on a reading and recording of the turbidity strip charts or computer records at four-hour intervals at least once per day. Compliance with the daily average operating turbidity shall be determined by averaging the results of all four-hour turbidity samples read during the day. The maximum daily peak and daily average turbidity shall be reported on the monthly monitoring reports.
- <sup>2</sup> The total residual chlorine shall be continuously recorded. The recorded charts shall be maintained by the Discharger for at least five years. The maximum daily peak, minimum daily peak and daily average total residual chlorine shall be reported on the monthly monitoring reports.
- <sup>3</sup> The total coliform organisms shall be sampled daily, the results shall be reported on the monthly monitoring report as daily maximum, 7-day median and 30-day maximum.

### **RECYCLING SYSTEM MONITORING**

The Discharger shall monitor the distribution and use systems to include storage facilities, and report the results of the monitoring monthly. Monitoring or samples need only be collected during periods of time recycled water is pumped off-site. The storage ponds shall be monitored as follows:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
pH	pH units	Grab	Monthly
Specific Conductivity	µmhos/cm	Grab	Monthly
Dissolved Oxygen	mg/l	Grab	Monthly
Pond Freeboard	Feet	Visual/measure	Monthly

The monthly monitoring report shall contain a complete listing of all reclamation distribution system overflows, bypasses and discharges other than as allowed by Waste Discharge Requirements. The monthly monitoring report shall contain a list of user inspections conducted by the Discharger and shall include, the number and location of cross connections, the number and location of improper air gaps, the location and estimated volume of any recycled water discharges off-site of the use area and all observations of misuse of recycled water. Any discharges of recycled water to surface waters, or surface water drainage courses must be reported by telephone within 12-hours to the Regional Board and reported in writing within two weeks.

### RECYCLING AREA MONITORING

The Discharger shall monitor the recycling areas daily during the irrigation season, and the results shall be included in the monthly monitoring report. Evidence of erosion, saturation, irrigation runoff, or the presence of nuisance conditions shall be noted in the report. Tertiary treated effluent monitoring results shall be used in calculations to ascertain loading rates at the water reclamation areas. Recycling areas shall be identified and monitored to include the following:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Flow	gallons	Continuous	Daily
Rainfall	inches	Observation	Daily
Acreage applied <sup>1</sup>	acres	Calculated	Daily
Water application rate <sup>2</sup>	gal/acre/day	Calculated	Daily
Total Nitrogen loading rate <sup>2</sup>	lbs/ac/month	Calculated	Monthly
TDS loading rate <sup>2</sup>	lbs/ac/month	Calculated	Monthly

<sup>1</sup> Land application areas shall be identified.

<sup>2</sup> For each land application area.

At least once per month during the irrigation season, the entire irrigated area shall be inspected on the morning following an irrigation event to identify any equipment malfunction or other circumstances that might allow irrigation runoff to leave the irrigation area and/or create ponding conditions that violate the Waste Discharge Requirements. A daily log of these inspections shall be kept at the facility and made available for review upon request.

### GROUNDWATER MONITORING

This groundwater monitoring **shall be conducted during the period of the groundwater quality study** and once Phase II of the recycled water use has been implemented, and the installed wells shall sampled and analyzed according to the schedule below.

Prior to sampling, the groundwater elevations shall be measured and the wells shall be purged at least three well volumes until temperature, pH, and electrical conductivity have stabilized. Depth to groundwater shall be measured to the nearest 0.01 feet. Samples shall be collected using standard EPA methods. Groundwater monitoring shall include, at a minimum, the following:

<u>Constituents</u>	<u>Units</u>	<u>Type of Sample</u>	<u>Sampling Frequency</u>
Depth to groundwater	0.01 feet	Measurement	Quarterly
Groundwater elevation <sup>1</sup>	0.01 feet	Calculated	Quarterly
Gradient	Feet/feet	Calculated	Quarterly
Gradient direction	degrees	Calculated	Quarterly
Boron	mg/l	Grab	Quarterly
Chloride	mg/l	Grab	Quarterly
Electrical conductivity	µmhos/cm	Grab	Quarterly
pH	pH units	Grab	Quarterly
Phosphorus	mg/l	Grab	Quarterly
Sodium	mg/l	Grab	Quarterly
TDS	mg/l	Grab	Quarterly
Total Nitrogen	mg/l	Grab	Quarterly
Total Coliform	MPN/100 ml	Grab	Semi-annually
Standard Minerals <sup>2</sup>	mg/l	Grab	Annually

<sup>1</sup> Groundwater elevation shall be determined based on depth-to-water measurements using a surveyed measuring point elevation on the well and a surveyed reference elevation.

<sup>2</sup> Standard Minerals shall include calcium, magnesium, hardness, sodium, potassium, alkalinity, sulfate, chloride, boron, and nitrate, and include verification that the analysis is complete (i.e., cation/anion balance).

## REPORTING

Monitoring results shall be submitted to the Regional Board by the **first day** of the second month following sample collection.

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

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 calculation and reporting of the values required in the discharge monitoring report form. Such increased frequency shall be indicated on the discharge monitoring report form.

By **30 January** of each year, the Discharger shall submit a written report to the Executive Officer containing the following:

- a. The names, certificate grades, and general responsibilities of all persons employed at the WWTP (Standard Provision A.5).
- b. The names and telephone numbers of persons to contact regarding the plant for emergency and routine situations.
- c. A statement certifying when the flow meter and other monitoring instruments and devices were last calibrated, including identification of who performed the calibration (Standard Provision C.6).
- d. A statement certifying whether the current operation and maintenance manual, and contingency plan, reflect the wastewater treatment plant as currently constructed and operated, and the dates when these documents were last revised and last reviewed for adequacy.
- e. A description of the overall status of BPTC implementation and compliance with interim groundwater limitations at the recycled water use areas over the past reporting year

The Discharger may also be requested to submit an annual report to the Regional Board with both 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 the compliance record. If violations have occurred, the report shall also discuss the corrective actions taken and planned to bring the discharge into full compliance with the waste discharge requirements.

All reports submitted in response to this Order shall comply with the signatory requirements of Standard Provision D.6.

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

Ordered by:

\_\_\_\_\_  
THOMAS R. PINKOS, Executive Officer

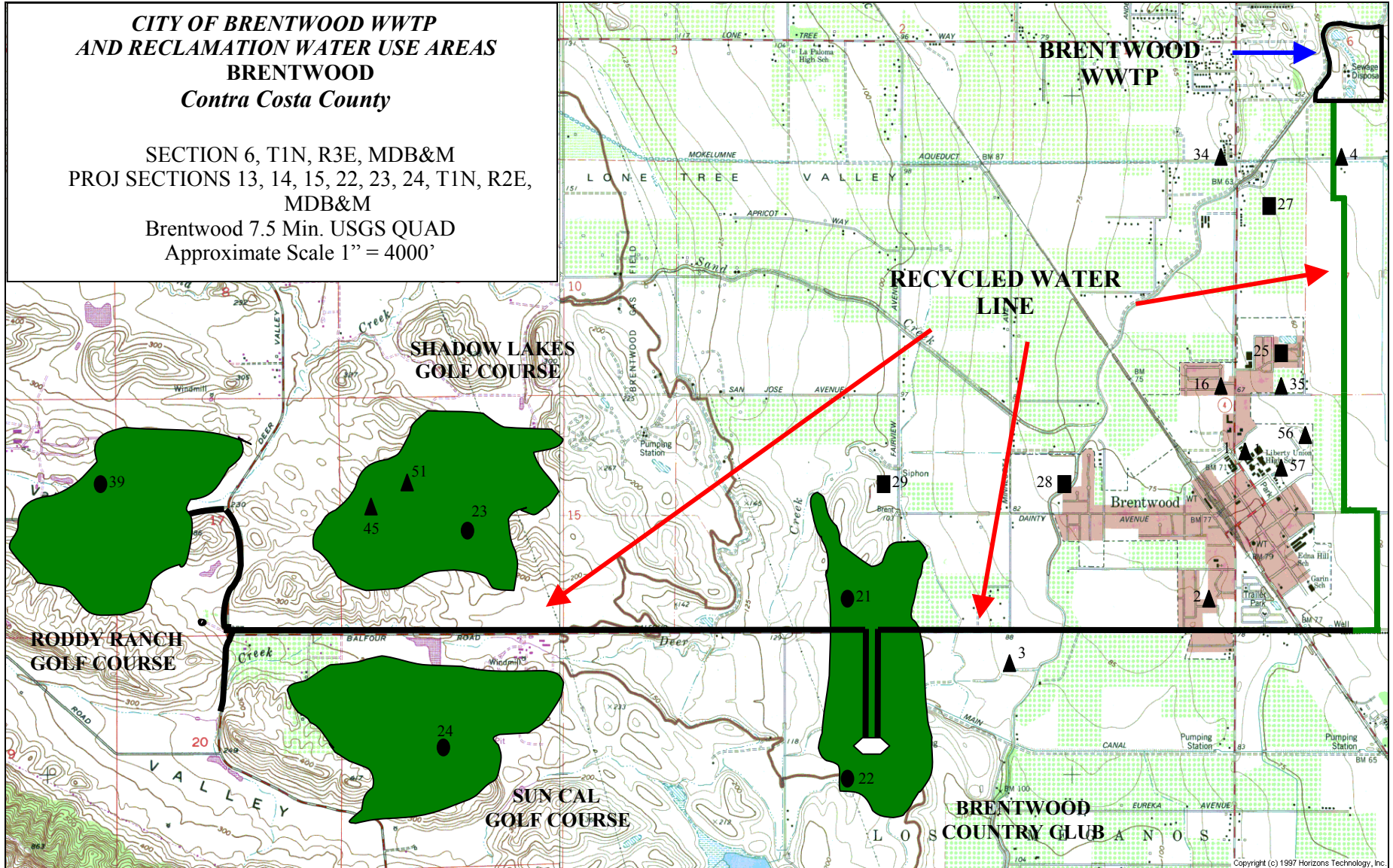
\_\_\_\_\_  
10 September 2004

(Date)

ATTACHMENT A

**CITY OF BRENTWOOD WWTP  
AND RECLAMATION WATER USE AREAS  
BRENTWOOD  
Contra Costa County**

SECTION 6, T1N, R3E, MDB&M  
PROJ SECTIONS 13, 14, 15, 22, 23, 24, T1N, R2E,  
MDB&M  
Brentwood 7.5 Min. USGS QUAD  
Approximate Scale 1" = 4000'





## RECYCLED WATER USERS

City Park	1
McClarren Park	2
Creekside Park	3
Sunset Park	4
Curtis Park	16
Brentwood Country Club Golf Course <sup>1</sup>	21,22
Shadow Lakes Golf Course <sup>1</sup>	23
SunCal Golf Course <sup>1</sup>	24
Brentwood Villa HOA	25
Havenwood Association	27
Deer Creek HOA	28
Apple Hill HOA	29
Marsh Creek Vista	34
Windsor Way Park	35
Roddy Ranch Golf Course <sup>1</sup>	39
City Park	45
Brentwood Lakes Park	51
Lyons Homes Park	56
Schuler Homes Park	57

<sup>1</sup> These golf courses form part of the City's Phase II recycled water use.

## ATTACHMENT B

### RULES AND REGULATIONS FOR RECYCLED WATER USE PROJECTS

Pursuant to California Water Code (CWC) section 13523.1 (b)(3), this Order requires the recycled water agency to establish and to enforce rules and regulations governing the design, construction and use of recycled water distribution and disposal systems by its customers. The rules and regulations shall be consistent with the following criteria:

- Title 22, Division 4, Chapter 3, *Wastewater Reclamation Criteria*;
- Title 17, Division 1, Chapter 5, Group 4, Article 1& 2, of the California Code of Regulations;
- The State Department of Health Services (State DHS) *Guidelines for Use of Recycled Water, Guidelines for Use of Recycled Water for Construction Purposes*;
- Any measures that are deemed necessary for protection of public health, such as the American Water Works Association (AWWA) California/ Nevada section, Guidelines for the Distribution of Non-Potable Water and Guidelines for Retrofitting to Recycled Water or alternate measures that are acceptable to the State DHS.

At a minimum, the rules and regulations shall notify the users that:

1. The use of recycled water shall not cause pollution, contamination, or nuisance, as defined by section 13050 of the California Water Code.
2. The Recycled Water Agency, the Regional Board, the State DHS, or an authorized representative of these parties, upon presentation of proper credentials, shall have the right to enter upon the recycled water use site during reasonable hours, to verify that the user is complying with the Recycled Water Agency's rules and regulations.
3. The recycled water user shall provide written notification, in a timely manner, to the Recycled Water Agency of any material change or proposed change in the character of the use of recycled water.
4. Prior to the initiation of recycled water service, the recycled water user shall submit plans and specifications for recycled water distribution facilities to the Recycled Water Agency.
5. The recycled water user shall designate a recycled water supervisor who is responsible for the recycled water system at each use area under the user's control. Specific responsibilities of the recycled water supervisor include the proper installation, operation, and maintenance of the irrigation system; compliance of the project with the Recycled Water Agency's rules and regulations, prevention of potential hazards and preservation of the recycled water distribution system plans in "as built" form. Designated recycled water supervisors shall obtain instruction in the use of recycled water from an institution approved by the State DHS.

6. The Recycled Water Agency may terminate service to a recycled water user who uses, transports, or stores such water in violation of the Recycled Water Agency's rules and regulations.
7. All recycled water storage facilities owned and/or operated by recycled water users as practical as possible shall be protected against erosion, overland runoff, and other impacts resulting from a 100-year, 24-hour frequency storm unless the Regional Board Executive Officer approves relaxed storm protection measures for the facility.
8. All recycled water storage facilities owned and/or operated by recycled water users shall be protected against 100-year frequency peak stream flows as defined by the Contra Costa flood control agency unless the Regional Board Executive Officer approves relaxed storm protection measures for the facility.
9. The Regional Board may initiate enforcement action against any recycled water user, including but not limited to the termination of the recycled water supply, who:
  - a. Dischargers recycled water in violation of any applicable discharge requirement prescribed by the Regional Board or in a manner which creates or threatens to create conditions of pollution, contamination, or nuisance, as defined in Water Code section 13050.
  - b. Uses, transports, or stores such water in violation of the rules and regulations governing the design, construction and use of recycled water distribution and disposal systems issued by the recycled water distribution and disposal systems issued by the recycled water agency in accordance with this attachment; or in a manner which creates or threatens to create conditions of pollution, contamination, or nuisance, as defined in Water Code section 13050.
10. A copy of the recycled water rules and regulations, irrigation system layout map, and a recycled water system operations manual shall be maintained at the use area. These documents shall be available to operating personnel at all times.
11. Irrigation with disinfected tertiary recycled water shall not take place within 50 feet of any domestic water supply well unless all of the following conditions have been met.
  - a. A geological investigation demonstrates that an aquitard exists at the well between the uppermost aquifer being drawn from the ground and the surface.
  - b. The well contains an annular seal that extends from the surface into the aquitard.
  - c. The well is housed to prevent any recycled water spray from coming into contact with the wellhead facilities.

- d. The ground surface immediately around the wellhead is contoured to allow surface water to drain away from the well.
  - e. The owner of the well approves of the elimination of the buffer zone requirement.
12. Impoundment of disinfected tertiary recycled water shall not occur within 100 feet of any domestic water supply well.
13. Irrigation with or impoundment of disinfected secondary- 2.2 or disinfected secondary-23 recycled water shall not take place within 100 feet of any domestic water supply well.
14. Irrigation with, or impoundment of, undisinfected secondary recycled water shall not take place within 150 feet of any domestic water supply well.
15. Recycled water facilities shall be operated in accordance with best management practices (BMP's) to minimize public contact with, and to prevent direct human consumption of recycled water.
16. All windblown spray and surface runoff of recycled water applied for irrigation onto property not owned or controlled by the discharger or recycled water user shall be prevented by implementation of BMP's.
17. Irrigation with recycled water shall be given during periods of minimal human use of the service area. Consideration shall be given to allow an adequate dry-out time before the irrigated area will be used by the public.
18. All drinking fountains located within the approved use area shall be protected by location and/or structure from contact with recycled water spray, mist, or runoff. Protection shall be by design, construction practice, or system operation.
19. Facilities that may be used by the public, including but not limited to eating surfaces and playground equipment and located within the approved use areas, shall be protected to the maximum extent possible by sitting and/or structure from contact by irrigation with recycled water spray, mist or runoff. Protection shall be by design, construction practice or system operation.
20. Spray irrigation with recycled water, other than disinfected tertiary recycled water, shall not take place within 100 feet of the property line of a residence or a place where public exposure could be similar to that of a park, playground, or school yard.
21. All use areas where recycled water is used and that are accessible to the public shall be posted with conspicuous signs, in a size no less than 4 inches by 8 inches, that include the following wording and picture in a size no less than 4 inches high by 8 inches wide: "RECYCLED WATER-DO NOT DRINK". See Figure No. 1 for the acceptable symbol. The sign(s) shall be of a size easily readable by the public. The prescribed

wording should also be translated into Spanish and other languages included in the required signs.

22. No physical connection shall be made or allowed to exist between any recycled water system and any separate system conveying potable water or auxiliary water source system.
23. The recycled water piping system shall not include any hose bibs. Quick couplers that are different from that used in potable water system or auxiliary water source system may be used.
24. The public water supply shall not be used as backup or supplemental source of water for a recycled water system unless the connection between the two systems is protected by an air gap separation which complies with the requirements of sections 7602(a) and 7603(a) of title 17 and the approval of the public water system has been obtained. If a "Swivel-ell" type connection is used it must be used in accordance with provisions of the Department of Health Services Policy Memo 95-004. Approved backflow prevention devices shall be provided, installed, tested, and maintained by the recycled water user in accordance with the applicable provisions of Title 17, Division 1, Chapter 5, Group 4, Article 2.
25. No person other than the Recycled Water Agency shall deliver recycled water to a facility. Connection to the irrigation system by an individual residence is prohibited.
26. All facilities shall be identified and labeled according to the type of water in each system.
27. All recycled water piping and appurtenances in new installations and appurtenances in retrofit installations shall be colored purple or distinctively wrapped with purple tape in accordance with chapter 7.9, section 4049.54 of the California Health and Safety Code.
28. Reuse site shut down tests and inspections shall be monitored by the State DHS.
29. Customer complaints concerning recycled water use that may involve public illness shall be reported to the County of Contra Costa Department of Environmental Health and the State Department of Health Services, and to the Recycled Water Agency who shall maintain a log of all customer complaints regarding recycled water.
30. Any backflow prevention device installed to protect the public water system shall be inspected and maintained in accordance with section 7605 of Title 17.
31. The amount of nitrogen from commercial fertilizers applied to irrigation use sites shall be managed to take into account the nitrogen content of the recycled water in order to ensure sufficient nitrogen uptake by the vegetation and prevent leaching of excess nitrates and nitrogen compounds into the soil beyond the root zone.



“Acceptable Symbol for DO NOT DRINK”

**FIGURE NO. 1**

## ATTACHMENT C

### **MONITORING WELL WORKPLAN AND MONITORING WELL INSTALLATION REPORT GUIDANCE**

Prior to installation of groundwater monitoring wells, the Discharger shall submit a workplan containing at least the information listed below. Following installation of the monitoring wells, the Discharger shall submit a report of results, as described below. All workplans and reports must be prepared under the direct supervision of, and signed by, a geologist registered by the State of California.

#### **Monitoring Well Installation Workplan**

##### A. General Information:

- a. Proposed monitoring well locations and rationale for location selection
- b. Equipment decontamination procedures
- c. 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 proposed drilling and logging methods

##### C. Monitoring Well Design:

- a. Casing diameter
- b. Borehole diameter
- c. Depth of surface seal
- d. Well construction materials
- e. Diagram of well construction
- f. Type of well cap
- g. Size of perforations and rationale
  - i. Grain size of sand pack and rationale
  - ii. Thickness and position of bentonite seal and sand pack
  - iii. Depth of well, length and position of perforated interval

##### D. Well Development:

- a. Method of development to be used
- b. Method of determining when development is complete
- c. Method of development water disposal

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

##### F. Well Sampling:

- a. Minimum time after development before sampling (48 hours)
- b. Well purging method and amount of purge water

- c. Sample collection and preservation method
- d. QA/QC procedures

G. Water Level Measurement:

- a. The elevation reference point at each monitoring well shall be within 0.01 foot.
- b. Ground surface elevation at each monitoring well shall be within 0.1 foot.
- c. The method and time of water level measurement shall be specified.

H. Proposed time schedule for well installation and development.

**Monitoring Well Installation Report**

A. Well Construction:

- a. Number and depth of wells drilled
- b. Date(s) wells drilled
- c. Description of drilling and construction
- d. Approximate locations relative to facility site(s)
- e. A well construction diagram for each well must be included in the report, and should contain the following details:
  - i. Total depth drilled
  - ii. Depth of open hole (same as total depth drilled if no caving occurs)
  - iii. Footage of hole collapsed
  - iv. Length of slotted casing installed
  - v. Depth of bottom of casing
  - vi. Depth to top of sand pack
  - vii. Thickness of sand pack
  - viii. Depth to top of bentonite seal
  - ix. Thickness of bentonite seal
  - x. Thickness of concrete grout
  - xi. Boring diameter
  - xii. Casing diameter
  - xiii. Casing material
  - xiv. Size of perforations
  - xv. Number of bags of sand
  - xvi. Well elevation at top of casing
  - xvii. Depth to ground water
  - xviii. Date of water level measurement
  - xix. Monitoring well number
  - xx. Date drilled
  - xxi. Location

B. Well Development:

- a. Date(s) of development of each well
- b. Method of development
- c. Volume of water purged from well
- d. How well development completion was determined
- e. Method of effluent disposal
- f. Field notes from well development should be included in report.



- C. Well Survey Data: provide reference elevations for each well and surveyor's notes
- D. Water Sampling:
  - a. Date(s) of sampling
  - b. How well was purged
  - c. How many well volumes purged
  - d. Levels of temperature, EC, and pH at stabilization
  - e. Sample collection, handling, and preservation methods
  - f. Sample identification
  - g. Analytical methods used
  - h. Laboratory analytical data sheets
  - i. Water level elevation(s)
  - j. Groundwater contour map

Explanation of any deviation from the approved workplan

## INFORMATION SHEET

MASTER RECLAMATION PERMIT  
CITY OF BRENTWOOD  
WASTEWATER TREATMENT PLANT  
CONTRA COSTA COUNTY

The City of Brentwood (City) owns and operates a wastewater treatment plant (WWTP), which has three disposal methods as described in the City's National Pollutant Discharge Elimination System (NPDES) Permit, Waste Discharge Requirements (WDRs) Order No. 5-00-171: off site reclamation, land disposal into existing percolation ponds, and discharge to Marsh Creek. To minimize discharge to Marsh Creek the City is proposing to implement off-site reclamation.

The California Department of Health Services (DHS) has established statewide recycling criteria in Chapter 3, Division 4, Title 22, California Code of Regulations (CCR), Section 60301, et seq. (Hereafter Title 22) for the use of recycled water for food crop, fodder, fiber, seed crop and landscape irrigation and impoundment supply. DHS revised the water recycling criteria contained in Title 22 on June 2001. The permit implements the reclamation criteria in Title 22 and other applicable regulations that apply to the production and use of recycled water.

The City's WWTP is capable of producing high quality tertiary effluent to comply with Title 22 recycling criteria. The WWTP system consists of screening, grit removal, oxidation and nitrification (by extended aeration activated sludge), denitrification (by anoxic basins), coagulation, tertiary treatment filtration, chlorination and dechlorination.

The City proposes to distribute recycled water in a two phase approach, with phase I allowing the use the recycled water for surface irrigation of park areas, and median vegetation as shown and listed in Attachment A. Other uses can include, playground irrigation, commercial landscape and residential irrigation, wetlands maintenance, street sweeping, construction (dust control, soil compaction and general construction use), for making concrete, log deck irrigation and industrial process water. Some reclamation uses, such as dust control, have lesser standards prescribed in Title 22 than uses such as playground irrigation. However, the City owns and operates one reclamation distribution system. Therefore, the uses of recycled water with the most stringent treatment standards, nonrestricted recreational impoundments and irrigation of public access facilities, are protective of all of the proposed reclamation uses and the treatment requirements of Title 22 have been applied in this permit. Phase II will address the storage of recycled water in impoundment areas for irrigation of golf courses and will be pursued upon completion of a groundwater study that will allow the City to make a more informed decision as to how to proceed with the use of recycled water in order to be consistent with State Board Resolution No. 68-16. The proposed recycled water users that would likely use storage ponds include the Roddy Ranch Golf course, the Brentwood Country Club Golf course, the SunCal Company Golf course, and the Shadow Lakes/Brookfield Homes Golf course.

The City is aware of the anti-degradation requirements regarding supplying recycled water to the golf courses that use storage ponds for irrigation could leave the City open for liability if the recycled water degraded the first layer of groundwater. It is in the best interest of the city to determine what is the actual background water quality of the first layer of groundwater before proceeding with phase II of the recycled water use. Therefore, a provision of this Order allows the City to conduct a groundwater quality study that will focus on the worst case area and determine the

background groundwater quality, and based on the results allow the City to determine whether the use of recycled water will have an impact on groundwater and if so what level of treatment would be required in order to be in compliance with State Board Resolution 68-16.

The golf courses may contain numerous hills and sloped areas that would promote runoff unless closely managed during irrigation. Such runoff cannot occur except under an NPDES permit, and the City in agreement with the users is required to provide all runoff controls necessary to keep irrigation runoff out of drainage channels and within the boundaries of each golf course property. However, Golf courses that have incidental runoff and operate their ponds in accordance with one of the operational procedures cited in the 24 February memorandum as described in finding No 8 of this order, will not require an individual NPDES permit. Furthermore, residences and snack areas may be built adjacent to the golf courses' greens. This permit requires compliance with Section 60310 of Title 22, CCR, which prohibits spray, mist, or runoff of recycled water from entering dwellings, outdoor eating areas, or food handling facilities.

The permit contains significant treatment requirements in order to assure protection of the public's health and compliance with Title 22 requirements. The tertiary recycled water shall, at a minimum, be adequately oxidized, coagulated, filtered, and disinfected. The 30-day average BOD and total suspended solids shall not exceed 10 mg/l. The 7-day average BOD and total suspended solids shall not exceed 15 mg/l. The daily maximum BOD and total suspended solids shall not exceed 20 mg/l and 30 mg/l respectively. The median concentration of total coliform bacteria measured in the disinfected effluent shall not exceed an MPN of 2.2 per 100 milliliters utilizing the bacteriological results of the last seven days for which analyses have been completed and the number of total coliform bacteria shall not exceed an MPN of 23 per 100 milliliters in more than one sample in any 30-day period. No sample shall exceed an MPN of 240 total coliform bacteria per 100 milliliters.

Disinfection of tertiary treated wastewater shall be accomplished by a chlorine disinfection process that provides a CT (chlorine concentration times modal contact time) value of not less than 450 milligram-minutes per liter at all times with a modal contact time of at least 90 minutes, based on peak daily design flow. Disinfected tertiary treated wastewater for unrestricted use shall be continuously sampled for turbidity using a continuous turbidity meter and recorder at a point prior to filtration and again following filtration. Turbidity measurements shall be based on a reading and recording of the turbidity strip charts or computer records at four-hour intervals at least once per day. Compliance with the daily average operating turbidity shall be determined by averaging the results of all four-hour turbidity samples read during the day. The results of the daily average turbidity determinations shall be reported monthly to the Regional Board. Recycled water in excess of the turbidity limits shall not enter the reclamation distribution system. An automated recycled water distribution system bypass is required to assure that water in excess of the turbidity limit does not enter the system.

This permit includes as Phase II recycled water users a number of golf courses (Roddy Ranch Golf course, the Brentwood Country Club Golf course, the SunCal Company Golf course, and the Shadow Lakes/Brookfield Homes Golf course). Each golf course may operate ponds to store recycled water. The permit requires that water in the surface layer of any pond or earthen reservoir containing recycled water shall contain dissolved oxygen concentrations not be less than 1.0 mg/l, pH shall not be less than 6.0 or greater than 9.0 and the pond freeboard shall not be less than 2-feet

The permit is adopted pursuant to Section 13523.1, Chapter 7, Article 2 of the California Water Code, which authorizes issuance of a Master Reclamation Permit to suppliers or distributors, or both, of recycled water in lieu of issuing individual water reclamation requirements to each recycled water user. The permit does not allow uses of recycled water other than those identified in Title 22 and any other uses of recycled water will be regulated under individual Waste Discharge Requirements.

The beneficial uses of the underlying ground water include municipal, domestic, agricultural and industrial supply. Groundwater Limitations have been included in the permit to assure that the use of recycled water does not degrade groundwater quality.

The discharge of recycled water to surface waters is also prohibited. All necessary measures must be taken to eliminate discharges to surface waters and assure compliance with the permit unless such discharges are of incidental nature and do not unreasonably affect the beneficial uses of the receiving water and do not result in exceeding an applicable water quality objective in the receiving water. Furthermore, the discharge of recycled water from golf course's storage ponds to surface waters or tributaries of surface waters during the wet months, shall not be in violation of this Order as long as these ponds are operated in accordance with one of the operational strategies described in Finding No. 49 of this order.

Recycled water is a waste and the discharge of wastes may not cause degradation of groundwater in accordance with the State Board's antidegradation policy (Resolution 68-16). Recycled Water Prohibitions have been included in this Order to assure that: recycled water is not directly discharged to surface waters; the by-pass or overflow of untreated or partially treated reclamation water is prohibited; excessive irrigation does not result in excessive runoff; overspray or runoff is minimized; and recycled water is not used or stored within 50 feet of any well used for domestic water supply. In the event the recycled water users violate or cause violation of any prohibition, limitation, specification or receiving water limitation, the City is required to notify the Regional Board by telephone within 12 hours and confirm the notification in writing within five days.

On 6 January 1977, the State Water Resources Control Board (State Board) adopted Resolution No. 77-1, *Policy with Respect to Water Reclamation in California*, which resolved to encourage water reclamation projects that replace or supplement the use of fresh water. In 1996, the State Board and the DHS set forth principles, procedures, and agreements to which the agencies committed themselves, relative to the use of recycled water in California, in a document titled *Memorandum of Agreement Between the Department of Health Services and The State Water Resources Control Board On The Use of Reclaimed Water* (MOA, 20 February 1996). The permit is consistent with the MOA. Recycled Water Limitations have been included in the permit to assure compliance with requirements contained in Title 22 and the DHS-State Board MOA.

The permit requires that the City establish and enforce rules and/or regulations for Users governing the design and construction of recycled water use facilities and the use of recycled water in accordance with the criteria established in Title 22 and the permit. The City shall develop administrative procedures and User Agreements requiring compliance with Title 22 criteria and this permit. Upon approval of the City's procedures and Agreements, the City may authorize specific additional reclamation projects on a case-by-case basis in accordance with the approved program and Agreements. The City must conduct periodic inspections of the Users facilities and operations to monitor and assure compliance with conditions of the permit. The City is required to take

whatever actions are necessary, including termination of delivery of recycled water to the User, to correct any User violations. The City is required to maintain a right-of-entry for all properties where recycled water is used and shall conduct regular inspections to assure cross connection are not made with potable water systems and air-gap devices are installed and operable.

The City is required to produce, maintain and comply with an "Engineer's Report", in accordance with Title 22, Sections 60323 and 60314, which must be approved by the California Department of Health Services. A Title 22 Engineering Report was submitted to DHS on 18 September 2000. DHS provided comments on the Title 22 Report, and on January 2003, a revised Title 22 report that reflects the existing and future reclamation system uses and addressed DHS's concerns was submitted.

The California Health and Safety Code, Division 104 Environmental Health, Section 116815, requires that "all pipes installed above or below the ground, on or after June 1, 1993, that are designed to carry recycled water, shall be colored purple or distinctively wrapped with purple tape. There are indications that some of the users of recycled water (i.e.: golf courses) have not utilized purple pipe, or have not used the alternative method of distinctly wrapping with purple tape, as required in Recycled Water Specification No. 5 of the permit throughout the recycling distribution system. Users of recycled water whose current conveyance pipes do not comply with California Health and Safety Code, Division 104 Environmental Health, Section 116815 with the approval from the DHS may provide an alternative form of identification, such as signs. Black pipe commonly used to deliver recycled water to individual plants via a drip irrigation system may be used in lieu of purple pipe or pipe wrapped with purple tape pipe.

The City is responsible for ensuring that recycled water meets the quality standards of the permit and for the operation and maintenance of transport facilities and associated appurtenances. The City must hold the Users responsible for the application and use of recycled water on their designated use areas and associated operations and maintenance in accordance with all applicable Title 22 requirements and this permit.

RDJ: