State of California
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

ORDER NO. R4-2006-0009

WASTE DISCHARGE AND WATER RECYCLING REQUIREMENTS
FOR
WEST COAST BASIN BARRIER PROJECT – EXPANSION PHASE III PROJECT

ISSUED TO

West Basin Municipal Water District and
Los Angeles County Department of Public Works

(File No. 93-009)

The California Regional Water Quality Control Board, Los Angeles Region (hereafter Regional Board) finds:

INTRODUCTION

1. Through continued effective operation of the West Coast Basin Barrier Project with injection of potable water into the West Coast Basin Barrier (Barrier, see Finding No. 10) since 1964, the Barrier has been established to prevent seawater intrusion and replenish aquifers.

2. The current Phases of the Project continuously conserve potable water during droughts, water rationing, competition for potable water, and increasing demands (particularly in the 1990s) by using recycled water, while continuously preventing sea water intrusion of groundwater and by replenishing aquifers as resources of water supply for domestic purposes.

3. By their advances in water treatment technology, the West Basin Municipal Water District (District, see Finding No. 6) has been injecting the reverse osmosis-treated recycled water (RO recycled water replacing potable water) produced at the West Basin Water Recycling Plant (Plant, see Finding No. 16) into the Barrier for the West Coast Basin Barrier Project through two phases since 1995, which are as follows:

   A. Phase I (Order No. 95-014, adopted by the Regional Board on January 23, 1995) – The amount of RO recycled water injected into the Barrier was not to exceed 5 million gallons per day (MGD) (approximately 5,600 acre feet per year (AFY)) and 50% of the total blended water injected.

   B. Phase II (Order No. 97-069, adopted by the Regional Board on May 12, 1997) – The amount of RO recycled water injected into the Barrier was not to exceed 7.5 MGD (approximately 8,400 AFY) and 50% of the total blended water injected.

4. The District proposes the West Coast Basin Barrier Project – Expansion Phase III Project (Expansion Phase III Project), which increases the amount of RO recycled water injected into the Barrier from 7.5 MGD to 12.5 MGD (approximately 14,000 AFY) for the initial operating period. It must not exceed 75% of the total blended water injected. Following the successful

completion of the initial operating period (see Section IV.1.), the amount of RO recycled water injected into the Barrier will be ultimately increased to 17.5 MGD (approximately 19,600 AFY), which will be the 100% RO recycled water injection project.

5. The Expansion Phase III Project is the first (and the cornerstone of an one hundred percent RO recycled water injection project) and is one of three Groundwater Recharge Reuse Projects designed to prevent seawater intrusion, conserve potable water, and artificially replenish groundwater resources in the Los Angeles Region. The other two projects are the Harbor Water Recycling Project – Dominguez Gap Barrier Project (Order No. R4-2003-0134, adopted by the Regional Board on October 2, 2003) and the Alamitos Barrier Recycled Water Project (Order No. R4-2005-0061, adopted by the Regional Board on September 1, 2005). These two projects are 50% RO recycled water injection projects.

PROJECT SPONSORS

6. **The West Basin Municipal Water District (District)** manages the West Coast Groundwater Basin located in Los Angeles County. The District sponsors, owns, manages, and leads the West Coast Basin Barrier Project and the Expansion Phase III Project, and currently purchases potable water from the Metropolitan Water District of Southern California (MWD). This potable water is a blend of imported water consisting of Colorado River water and State Project water that is filtered and treated by the MWD at their Jensen, Diemer, and Weymouth Treatment Plants. The District owns the site of the West Basin Water Recycling Plant (Plant, see Finding No. 14) on which the advanced wastewater treatment facilities were built. The District is the purveyor of the RO recycled water produced at the Plant.

7. **The Los Angeles County Department of Public Works, Hydraulic/Water Conservation Division (LACDPW)** currently operates the Barrier and continues to operate and maintain the existing water transmission pipeline, distribution header, injection wells, and monitoring wells located along the Barrier.

REGULATORY AGENCIES

8. The Los Angeles Regional Water Quality Control Board (Regional Board) is the permitting agency for this Project involving the use of RO recycled water for groundwater direct injection. This Regional Board issues Waste Discharge Requirements (WDRs) and Water Recycling Requirements (WRRs) to assure that this Project does not adversely affect groundwater quality.

9. The California Department of Health Services (DHS) is the agency with the primary responsibility for establishing criteria, under Title 22 of the Code of Regulations, to protect the health of the public using the groundwater basins as a source of potable water and to protect the water quality in the receiving aquifers, and the Regional Board is guided by DHS' requirements. DHS has provided comments to the Regional Board, which have been incorporated into these requirements.

PURPOSE OF ORDER

10. On June 20, 2005, the District submitted a Report of Waste Discharge (ROWD) to this Regional Board and applied for WDRs and WRRs, pursuant to California Water Code section 13522.5, for the WCBBP.

11. This Order is the reissuance of WDRs and WRRs to the two proponents (collectively referred hereinafter as Project Sponsors) described above for the Expansion Phase III Project, pursuant to California Water Code section 13523.1. The Project Sponsors are both individually, and collectively, responsible for compliance with the requirements in this Order.

WEST COAST BASIN BARRIER PROJECT – EXPANSION PHASE III PROJECT

12. **West Coast Groundwater Basin (Basin) and West Coast Basin Barrier (Barrier)**

A. The Basin* located in the southwestern Los Angeles Coastal Plain consists of five principal aquifers, Gardena, 200-Ft Sand, 400-Ft Gravel, Silverado, and Low San Pedro, which form a complex series of interconnected sand and gravel deposits. In general, the aquifers of the Basin are in hydraulic continuity with the Pacific Ocean. Prior to the extraction of groundwater from wells, subsurface flow occurs between the Pacific Ocean and aquifers of the Basin with the direction of flow towards to the Pacific Ocean. Decades of over pumping caused the groundwater levels in the Basin of Los Angeles County to drop, resulting in a loss of groundwater storage capacity and seawater intrusion into the potable aquifers, such as the Silverado Aquifer, which underlies most of the Basin and provides the majority of the domestic groundwater production.

*: The Basin is an important source of local groundwater, which provides 20% of the water demands in the region. The District provides 80% of the water used in the District's service area serving a population of 830,000 people.

B. The Los Angeles Coastal Plain covers approximately 480 square miles and is bordered by the Santa Monica Mountains to the north, the Pacific Ocean to the south and west, the Merced and Puente Hills to the northeast, and the Los Angeles/ Orange County line to the southeast. This last boundary is more of an institutional border than a physical one; the geology is such that the groundwater basin is hydrologically continuous across this border into Orange County. Faults in the Coastal Plain break the continuity of geologic formations and thus, alter the flow characteristics in the aquifers. The Newport-Inglewood Uplift separates the Coastal Plain into two groundwater basins, the West Coast and Central Basins.

C. The Barrier is designed to protect the Basin from seawater intrusion through creation of a pressure ridge by injection of water into the Barrier through an alignment of 153 injection wells located approximately 0.4 to 1.9 miles inland parallel to the Santa Monica Bay coastline from Los Angeles International Airport to the Palos Verdes Hills (Figure P1 depicts the vicinity map of the Barrier). The pressure ridge assures that groundwater will flow from the ridge toward the Pacific Ocean, thereby assuring that seawater cannot flow inland through the exposed aquifers. The failure to maintain an effective seawater intrusion barrier would cause serious water quality degradation in drinking water aquifers

located in southwestern Los Angeles County, and the potential loss of this water resource.

D. The Barrier is located in the western portion of the Basin within Hydraulic Unit 405.12, belonging to the Los Angeles-San Gabriel Hydraulic area. Along the coast, the Barrier is bounded to the north by the Ballona Escarpment, to the west by the Santa Monica Bay, to the southwest by Palos Verdes Hills, to the south by the San Pedro Bay, and to the east by the Newport-Inglewood Uplift depicted in Figure P1.

E. In the vicinity of the Barrier, there are three water-bearing units, which are subject to seawater intrusion. These include the 200-foot Sand near surface and in order from the near surface to bottom, Silverado, and Lower San Pedro Aquifers. The geological cross section for these aquifers is illustrated in Figure P2.

13. **Injection Water** – Since 1995, the RO recycled water, and the potable imported water (State Water Project and/or Colorado River) purchased by the District from the Metropolitan Water District of Southern California (MWD) were injected into the Barrier. For the ten-year period between 1995 Water Year to 2004 Water Year, imported water injected ranged from 2.0 to 16.8 MGD, with a historic maximum (between 1964 to 1989) of approximately 36.8 MGD. The amount of RO recycled water injected has historically averaged approximately 43% of the total recharge. Approximately 4.1 MGD of imported water is currently discharged into the Barrier (based on Fiscal Year 04-05 records that include a month-long period when the Barrier was down for maintenance).

14. The Expansion Phase III Project proposes some changes and upgrades on injection facilities of the existing project (Phase II). These changes and upgrades are outlined in Finding No. 16.B. The Expansion Phase III Project will treat wastewater to meet drinking water standards and other limits imposed on RO recycled water intended for groundwater direct injection and indirect potable reuse.

15. **Source and Treatment of Secondary-Treated Effluent Water**

A. The source of the injection water is the secondary wastewater-treated effluent generated at the Hyperion Treatment Plant (Hyperion). Hyperion is a publicly owned treatment work (POTW) located at 12000 Vista Del Mar Boulevard, Playa Del Rey, California 90293 (see Figure P1 for vicinity map). Hyperion has an average dry weather design treatment capacity of 450 MGD. In 2004, Hyperion discharged 315 MGD of secondary treated municipal wastewater to the Pacific Ocean under a National Pollutant Discharge Elimination System (NPDES) permit (No. CA0109991), issued by this Regional Board.

B. Hyperion treats sludge and wastewater from industrial, commercial and residential sources from the City of Los Angeles (85%) and adjacent cities and agencies (15%) in compliance with 40 Code of Federal Regulations Part 403 and the NPDES permits for Hyperion and other POTWs.

C. Treatment at Hyperion consists of preliminary, primary, and secondary treatments. Figure P3 depicts the flow diagram of the treatment process. Preliminary treatment at the headworks removes coarse particles and debris from the wastewater. The primary

settling tanks remove the majority of the organic and inorganic suspended solids. Secondary treatment uses the activated sludge process and consists of aeration basins where most of the total organic carbon is removed by microorganisms, followed by clarifiers that remove most of the microorganisms and suspended inorganic solids.

D. Solids recovered from wastewater treatment processes include grit, primary screenings, primary sludge and skimmings, thickened waste activated sludge, digested sludge screenings and digester cleaning solids. The fine solids (grit, primary screenings, digested sludge screenings, and digester cleaning solids) that consist of primarily inorganic materials are hauled away to landfills. The remaining solid (primary sludge and skimmings, and thickened waste activated sludge) are anaerobically digested onsite.

E. The City of Los Angeles Bureau of Sanitation (City) maintains a comprehensive Industrial Pretreatment and Source Control Program (Program*) approved by the U.S. Environmental Protection Agency for control of waste discharges from industrial sources into the wastewater collection system. The City is responsible for collecting all water quality samples of the treated effluent to fulfill the requirements of its NPDES permits issued by the Regional Board. On May 19, 2004, the City agreed to investigate the industrial sources of perchlorate, NDMA, and 1,4-dioxane. The City also agreed to work cooperatively with the District to develop the Source Control Implementation Plan for increased source control investigation.

*: This Program minimizes the risk that wastewater treated at Hyperion will be contaminated with toxic chemicals in order to protect the treatment facilities and receiving water beneficial uses. The scope and purpose of this Program needs to be supplemented by the approved Source Control Implementation Plan (SCIP) to include not only contaminants that may be detrimental to the facilities and the environment, but also include contaminants specified by the DHS that may be harmful to human health and drinking water supplies. The supplement to the Program will be administered locally solely for the purpose of addressing Expansion Phase III Project's water quality needs and does not require modification of the existing EPA approved and enforced program. The existing Program does not address all contaminants that have drinking water maximum contaminant levels. The District, through a comprehensive monitoring program defined in the SCIP, will be able to reasonably ensure that the recycled water produced at the Plant for recharge into the groundwater basins via injection at the Barrier is not contaminated with toxic chemicals of industrial origins that are of concern to the DHS and the Regional Board. The District agreed to develop the SCIP in consultation with the City, based upon a cooperative Memorandum of Agreement between them specifying responsibility of the SCIP. The SCIP was provided to the DHS in March 2005. DHS approved the SCIP in October 2005. The Memorandum of Agreement (MOA) will be agreed and signed by the City and the District during Phase III implementation and prior to the injection of 100% recycled water.

16. **West Basin Water Recycling Plant (Plant)**

A. The Plant has been in service since 1995 and is located at 1935 Hughes Way, El Segundo, California 90245 (Figure P1). Approximately 35 MGD of secondary-treated

effluent from Hyperion will receive additional treatment at the District's Plant. The Plant consists of three treatment trains currently designed to produce a total up to 41.8 MGD of recycled water, including 30 MGD of Title 22 recycled water for landscape and agricultural irrigation and industrial applications, 7.5 MGD of RO recycled water for the Barrier injection, and 4.3 MGD of both once and twice-treated RO recycled water for the boiler feed system located at the Chevron Refinery in El Segundo.

B. At the Plant, the Expansion Phase III Project is designed to produce approximately 19,600 AFY (17.5 mgd) of RO treated recycled water for the Barrier injection through a two-stage operation. The first stage of the Expansion Phase III Project will increase RO recycled water production and injection into the Barrier up to 12.5 mgd for the initial operation period. During this initial stage, approximately 5 mgd of imported potable water will be blended with the RO recycled water supply and injected into the Barrier. Pending DHS approval, the District proposes to implement a second stage to increase RO recycled water production and injection into Barrier up to 17.5 mgd. The Expansion Phase III Project consists of four major components and will be located at the same site as the existing project (Phase II) in El Segundo:

   a. Replacement of the existing lime clarification pretreatment system with a microfiltration pretreatment system;

   b. Utilization of thin film composite membranes for all reverse osmosis treatment trains;

   c. Installation of UV light disinfection and nitrosodimethylamine (NDMA) destruction of the total barrier recycled water flow stream; and,

   d. Addition of hydrogen peroxide storage and feed facilities, which, in conjunction with UV disinfection, will provide advanced oxidation.

   During construction of the Expansion Phase III Project, the existing project (Phase II) will remain in operation to supply RO recycled water to the Barrier.

C. Figure P4 presents the schematic of the RO treatment train for the Barrier injection at the Plant. It is comprised of the following:

   a. **Automatic Strainers:** The Automatic Strainer is used to protect downstream membrane treatment systems from large particles. The secondary-treated feedwater generated at Hyperion will pass through automatic in-line strainers and be chloraminated prior to microfiltration. Fine solids that are captured will be returned to the existing dewatering holding basin at the Plant.

   b. **Microfiltration (MF):** MF is used to reduce the turbidity and silt density of the effluent of the automatic strainers prior to RO for increased system reliability and reduced RO membrane fouling. The MF units are periodically back-washed to clean the membranes. The backwash waste is sent back to the equalization basin and then pumped to the solids handling system.

c. **Reverse Osmosis (RO):** The MF filtrate is fed into RO process trains that uses thin film membranes under Phase III of this Project, with a normal permeate capacity of 12.5 and ultimately 17.5 MGD. The RO removes salts, minerals, metal ions, organic compounds, and microorganisms, which are commonly called a brine stream. This brine stream is piped back to Hyperion where it will be recombined with the 315 MGD effluent (this number fluctuates according to Hyperion), and eventually be discharged into the Pacific Ocean through the Hyperion's 5-mile outfall diffuser system under a separate NPDES permit.

d. **Advanced Oxidation Process (AOP):** The AOP will consist of two steps: hydrogen peroxide will be added to the RO permeate upstream of UV light treatment. UV irradiation can be used for adequate disinfection and reduction of light-sensitive contaminants. Hydrogen peroxide exposed to UV irradiation produces hydroxyl radicals that result in advanced oxidation. The AOP system is designed and constructed to adequately disinfect RO permeate and reduce NDMA levels to a concentrations below 10 ng/L. The hydrogen peroxide dosage will be optimized during operations and maintenance per DHS requirements.

The District conducted an **AOP Study**. The water quality produced by the MF/RO/AOP treatment train is representative of that anticipated from the Expansion Phase III Project. Water quality data from the MF/RO/AOP train indicate that the RO recycled water of the Expansion Phase III Project will meet all requirements of the California Drinking Water Primary and Secondary Maximum Contaminant Levels (MCLs), and Chemicals of Concern to the regional Board. Data from the MF/RO train also have indicated that selected pharmaceutically active compounds and other toxic contaminants not included in the drinking water standards are removed or reduced to low levels in the RO recycled water. The AOP was recommended by the Expert Panel as an added barrier for unknown contaminants and for the destruction of NDMA.

e. **Post-Decarbonation:** The influent of the RO-treated effluent passes through a decarbonator to release excess carbon dioxide.

f. **Lime Stabilization:** Product water from UV system is combined and lime (calcium hydroxide) will be added to adjust the pH and reduce the potential for minerals to be leached from the cement lining used in the transmission pipeline, which would affect the integrity of the transmission pipelines.

g. **Barrier Water Pump Station:** Two new pumps, one duty and one standby unit, will be added at the existing Barrier Water Pump Station.

h. **Solids Handling Process:** Upgrades will be made to increase the capacity of the existing solids handling systems, which consist of the dewatering holding basin and washwater equalization basin serving the barrier water treatment processes. Solids will be removed using high-rate clarifiers, thickened using gravity thickeners, and dewatered using plate-and-frame presses. The recovered liquid stream will be returned to the Title 22 Plant for treatment. Dewatered cake solids will be hauled for beneficial use or to a landfill for disposal or for beneficial use.

The proposed Expansion Phase III Project complies with Section 60320 of Article 5.1, entitled "Groundwater Recharge", of the California Code of Regulations Title 22, Division 4, Chapter 3, entitled "Water Recycling Criteria." The DHS considers the above treatment to be the best available treatment technology for recycled water used for groundwater recharge by direct injection.

17. **Transmission System of RO Recycled Water** – The RO recycled water will be delivered from the barrier water pump station, through the blend station, to the barrier injection wells. The transmission line leaves the Plant at the northeast corner of the Plant, runs through the golf course parallel to the Southern California Edison's (SCE) right-of-way, and then turns toward the north across the SCE right-of-way and the Hughes' property to El Segundo Boulevard. The line then runs east along El Segundo Boulevard for approximately 2,000 feet to the Barrier Blend Station.

18. **Barrier Blend Station** – The Barrier Blend Station is the point where the RO recycled water from the Plant mixes with the potable water from MWD on its way to the barrier injection system. The MWD delivery system will be protected by an above-grade, backflow prevention system installed in the Los Angles County Department of Public Works' potable water feed line as a method of in-line protection. Backflow prevention consists of two identical parallel pipe trains with double check valves in series. From the Barrier Blend Station, RO recycled water splits into two streams to be blended with the existing potable water from MWD. One blended stream is injected into the North barrier wells and the other stream into the South barrier wells.

19. **Barrier Pipelines and Injection Wells**

A. The West Coast Basin Barrier Project consists of two sections of pressurized pipelines. The northern section of the barrier pipeline runs south from Los Angeles International Airport to Hermosa Beach. The southern section of the barrier pipeline begins approximately 1,000 feet south of the northern section and continues southward to the Palos Verdes Hills. The size of the barrier pipeline ranges from 8 inches to 18 inches.

B. The pipelines and injection wells are primarily located in the Cities of El Segundo, Manhattan Beach, Hermosa Beach, and Redondo Beach, California. The injection wells are screened at selected depths ranging from 280 feet to 700 feet below ground surface (bgs) to allow water injection into three different aquifers, 200-ft Sand, Silverado, and Low San Pedro Aquifers. Two types of injection wells were constructed at the Barrier: single and dual. Total diameter of the borehole is approximately 32 inches. Injection wells are equipped with a 36-inch-diameter protective casing and a 12-inch-diameter, asbestos-cement pipe casings screened at one or two intervals.

No changes are proposed to the existing distribution system or Barrier injection facilities, which inject either 100% potable, potable-RO recycled water, or 100% RO recycled water through the LACDPW operation.

C. Of the 153 existing injection wells shown in Table P1 of Attachment A-1, 143 are single injection wells, injecting only into either 200-ft, Silverado or Low San Pedro aquifer. Another 10 are dual injection wells, injecting separately into the 200-ft and Silverado aquifers. Distances between injection wells vary between approximately 200 feet to

1,000 feet, for a total span of approximately 9 miles. There are no changes proposed to any existing extraction wells located seaward of the injection wells.

20. **Groundwater Monitoring Wells**

A. Eight existing groundwater monitoring wells have monitored the groundwater near the Barrier since 1995. One new nested monitoring well was recently installed for the Expansion Phase III Project and monitors each of the three aquifers. The new monitoring well was constructed in Redondo Beach along the same flow path from the Barrier as existing monitoring Well Nos. 17B and 17C. The new multi-depth monitoring well in Figure P5 is be located at the approximately projected three-month underground travel time from the Barrier towards east and will sample the same aquifers recharged by the injection wells. The following nine monitoring wells in Table P1 will be used to detect, track, and monitor the underground movement of the recharge water towards the nearest active drinking water production Manhattan Beach Well No. 11a, and the water quality of various aquifers comprising the groundwater basins for compliance purposes.

Table P1 – Monitoring Wells

Well No.	Distance from Barrier	Aquifer(s) Monitored and Perforations
WB-1	≤ 100 feet east	200-Ft/Silverado/Lower San Pedro
9B	2162 feet east	Silverado
14B	1850 feet east	Silverado (-197 ~ -212) (-237 ~ -327)
17B	566 feet east	200-Foot Sand/Silverado (-150 ~ -480)
17C	566 feet east	Lower San Pedro (-515 ~ -540) (-595 ~ -655)
690A	450 feet east	200-Foot Sand/Silverado (-23 ~ -183)
703G	391 feet east	Silverado (-153 ~ -263)
735A	3075 feet east	Lower San Pedro (-536 ~ -586)
1318N	2866 feet east	200-Foot Sand (-34 ~ -54)

B. The estimated underground travel time to the new monitoring well is approximately three months. Along this same flow path, the estimated underground travel time to monitoring Well Nos. 17B and 17C, is two to three years. These estimates are based on sampling and analysis of naturally occurring, intrinsic tracer constituents in the injected recycled water, such as chloride. A study entitled "Naturally Occurring Tracer Constituents in Water Injected for Maintenance of the West Basin Seawater Intrusion Barrier" prepared by McGuire Environmental Consultants, concluded that "naturally existing anions and their ratios should function as adequate tracers of groundwater movement for water injected into seawater intrusion barriers due to the distinct characteristics of the various source waters."

21. **Groundwater Quality Monitoring** – A detailed review of groundwater quality data provided in Annual Reports from 2000 to 2004 collected from the eight existing groundwater monitoring wells shows that the receiving groundwater quality is good and in compliance with MCLs and Basin Plan groundwater quality objectives, in general.

An exception is Well No. 735A, located approximately 3,075 feet east of the Barrier. Well No. 735A shows high concentrations of total dissolved solids (8,600 to 12,000 mg/L), chloride (4,260 to 6,073 mg/L), and sulfate (660 to 760mg/L). The concentrations of these constituents in the blended water are 229 to 360 mg/L, 46 to 69 mg/L, and 39 to 97 mg/L, respectively. Therefore, the high concentrations of total dissolved solids, chloride, and sulfate detected at Well No. 735A did not result from the West Coast Basin Barrier Project.

22. **Projected Travel Times and Dilutions to Nearest Production Wells** – In the 1993 Engineering Report, CH2M Hill used the Coupled Flow Energy and Solute Transport (CFEST) model to verify travel times and percentages of the RO recycled water in the 200-Ft, Silverado, and Low San Pedro aquifers from the Barrier to the nearest production wells. The simulation results are in Table P2 and Table P3 for travel times and percentages, respectively.

A. **Travel Times** – Table P2 indicates the different maximum travel distances of blended water in the different aquifers over 1, 5, and 20 years. The blended water will only travel approximately 0.2 to 0.3 miles (1,060 to 1,580 feet) in the different aquifers over one year and will be retained in the different aquifers for approximately 15 to 20 years prior to being extracted at the currently existing, nearest production wells.

Table P2 – Travel Times vs. Distances of 50% Blended Water in Different Aquifers between Barrier and Nearest Production Wells

Aquifer	1 year	5 years	20 years	Time to nearest production well
200-Ft	0.3 mile	1.0 mile	3.0 mile	20 years
Silverado	0.2 mile	0.8 mile	2.5 mile	15 – 20 years
Lower San Pedro	0.3 mile	1.1 mile	2.5 mile	15 years

B. **Percentages** – Table P3 indicates 20% of injected blended water (50% RO recycled water, Phase I) in the different aquifers after 5, 10, and 20 years of injection. The percentage of injected blended water in production wells after 20 years of injection is estimated to range from 40% to less than 20%. The CFEST simulation results indicate that even when 100% RO recycled water is injected, less than 50% of RO recycled water will be extracted from production wells within 20 years of injection.

Table P3 – 20% of Blended/Injected Water (Phase I) in Different Aquifers between Barrier and Nearest Production Wells

Aquifer	5 year	10 years	20 years	Time to nearest production well
200-Ft	0.7 mile	1.1 mile	1.8 mile	20 years
Silverado	0.9 mile	1.3 mile	2.2 mile	15 – 20 years
Lower San Pedro	1.2 mile	1.7 mile	2.8 mile	15 years

C. **Nearest Well Travel Time** – The nearest active domestic well to the Barrier is Manhattan Beach Well No. 11a, which is owned and operated by the City of Manhattan Beach and is located 7,400 feet (1.4 mile) to the east of the Barrier. The rate of groundwater movement eastward from the Barrier is estimated to be 300 to 500 feet per year. This domestic water production well is more than a projected 15 years

underground travel time from the Barrier. This indicates that injected water will remain in the underground for greater than one year before reaching the nearest potable water well, which is a requirement of this permit. In addition, less than 50% of RO recycled water will be extracted at Manhattan Beach Well No. 11a after 20 years.

DHS has accepted the use of intrinsic tracers based on a letter submitted to the District on November 19, 2004 for a six-month trial period. The final determination of the District tracer program will be made following submittal and review of the data.

23. **Recycled Water Quality for Groundwater Injection**

A. Results of monitoring reports indicate that the product water will meet all requirements of the California Drinking Water Primary and Secondary Maximum Contaminant Levels (**MCLs**). The AOP Study (see Finding No. 16.C.d) also has indicated that selected pharmaceutically active compounds and other toxic contaminants not included in the drinking water standards, are removed or reduced to low levels in the product water.

MCLs are health protective drinking water standards adopted by DHS that are to be met by public water systems. MCLs take into account not only the chemicals' health risks but also factors such as their detectability and treatability, as well as the costs of treatment. More information, such as DHS' process for establishing MCLs, is available in the DHS' website at http://www.dhs.ca.gov/ps/ddwem/chemicals/chemindex.htm.

B. The Monitoring and Reporting Program (MRP) that is part of this Order requires the Project Sponsors to monitor for all constituents of drinking water specified in Chapter 15, Title 22, California Code of Regulations, both regulated and unregulated. For contaminants in concentrations above the MCLs or Public Health Goals (**PHGs**), or for contaminants that do not have MCLs but are in concentrations above the Notification Levels (**NLs**), previously referred to as "Action Levels", the Project Sponsors are required to investigate the cause and implement remedial or corrective actions per the DHS approved SCIP.

PHGs are levels of contaminants in drinking water that pose no significant health risks if water is consumed for a lifetime and are based on risk assessments. They are established by Cal/EPA's Office of Environmental Health Hazard Assessment, pursuant to Health and Safety Code §116365(c), for contaminants with MCLs or for contaminants for which DHS plans to promulgate MCLs. Health and Safety Code §116365(a) requires DHS to establish contaminants MCLs at levels as close as is technically and economically feasible to the contaminants' PHGs. **NLs** are health-based advisory levels established by DHS for contaminants in drinking water with no MCLs. NLs are scientifically calculated using standard risk assessment methods for non-cancer and cancer endpoints, and typical exposure assumptions. Chemicals for which NLs are established may eventually be regulated by an MCL, depending on the extent of contamination, the levels observed, and the risk to human health. More information for drinking regulations for PHGs and NLs is available in the DHS' website at http://www.dhs.ca.gov/ps/ddwem/chemicals/AL/notificationlevels.htm.

C. To address concerns regarding emerging chemicals including endocrine disruptors and pharmaceutically-active chemicals analyzed annually, the MRP also requires the Project Sponsors to conduct quarterly priority pollutants screening and annually tentatively identified chemical analysis (TIC). A TIC is a special analytical procedure to identify and quantify detected compounds that are not on the target list for the specific method being analyzed. Detected peaks that correspond to a compound on the target list will be identified and quantified. Unidentified peaks will be compared with the mass spectrometer reference library containing approximately 75,000 compounds to identify the compound. The DHS has specified some endocrine disrupting chemicals, pharmaceuticals and other chemicals for monitoring (see MRP).

D. The Regional Board recognizes that certain chemicals (such as perchlorate, 1,4-dioxane, NDMA*, and 1,2,3-trichloropropane, in Attachment A-8: Chemicals of Concern to the Regional Board) not having MCLs may be a threat to groundwater quality, and that the science surrounding these chemicals is evolving with respect to health threats from these chemicals and possible loss of beneficial uses. Therefore, in order to implement the State Antidegradation Policy, and based upon the best science available, limits have been established for these chemicals based upon the standard risk assessment methods for non-cancer and cancer endpoints, and typical exposure assumptions, including a 2-liter per day ingestion rate, a 70-Kilogram adult body weight, and a 70-year lifetime.

For emergent chemicals that are not considered carcinogens, the limit is derived from the "No observed adverse effect level" (NOAEL), adjusted by appropriate factors to take into account uncertainties in the available data. The NOAEL threshold level protects the most at risk population of individuals, such as children and older people. An estimate of drinking water's contribution to total exposure to the emergent chemical is also included.

For those emergent chemicals that are considered carcinogens, the limit is based upon a "*de minimis*" theoretical lifetime risk of up to one excess case of cancer in a population of one million people.

As the science continues to evolve, this Permit may need to be updated to reflect the current science.

*NDMA – Based on the NDMA profile results between 2000 and 2003, provided by the District, the concentrations of NDMA in the RO recycled water were between 26 µg/L and 755 µg/L. Once the UV is online, the concentrations of NDMA in the RO recycled water are expected to be greatly reduced (to less than 10 ng/L).

E. If the RO recycled water does not meet permit requirements for the injection wells but meets the requirements for discharge from Hyperion to the Pacific Ocean, the RO recycled water can be discharged directly to the Pacific Ocean under Hyperion's NPDES permit. If the RO recycled water does not meet NPDES permit requirement for the Hyperion discharge to the Ocean, the West Basin Water Recycling Plant for the Expansion Phase III Project will be shut down and any off-spec water in storage will be sent to the head of Title 22 treatment train for treatment.

24. **Contingency Plan** – For the Expansion Phase III Project, the District has developed an Operation, Maintenance, and Monitoring Plan (OMM Plan) that incorporates specific procedures to be followed by operating staff for all potential emergencies or conditions, which might lead to RO recycled water unacceptable for injection. The OMM plan for the Expansion Phase III Project that will be used to ensure that equipment and facilities for treatment and recharge operate at peak performance levels. The OMM Plan was provided to the DHS ~~on~~ in ~~July 1~~October 2005. The DHS approved it with the conditions of some revisions ~~in~~ on November 22, 2005.

25. An independent **Expert Advisory Panel** has reviewed the planning and preliminary design of the Expansion Phase III Project. The Expert Advisory Panel prepared a report on their Findings and made Recommendations. The DHS concurs with the Expert Advisory Panel's Findings and Recommendations.

APPLICABLE PLANS, POLICIES AND REGULATIONS

26. ***Basin Plan*** – The Regional Board adopted a revised *Water Quality Control Plan for the Los Angeles Region: Basin Plan for the Coastal Watersheds of Los Angeles and Ventura Counties* (Basin Plan) on June 13, 1994, and amended by various Regional Board resolutions. This updated and consolidated plan represents the Board's master quality control planning document and regulations. The Basin Plan (i) designates beneficial uses for surface and groundwater, (ii) sets narrative and numerical objectives that must be attained or maintained to protect the designated (existing and potential) beneficial uses and conform to the State's antidegradation policy, and (iii) includes implementation provisions, programs, and policies to protect all waters in the Region. In addition, the Basin Plan incorporates (by reference) all applicable State and Regional Board plans and policies and other pertinent water quality policies and regulations. This Order implements the plans, policies, and provisions of the Board's Basin Plan.

The Basin Plan (Chapter 3) incorporates Title 22 primary MCLs by reference. This incorporation by reference is prospective including future changes to the incorporated provisions as the changes take effect. Also, the Basin Plan specifies that "Ground waters shall not contain taste or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses." However, for the purpose of this Order, odors due to chlorination are acceptable. Therefore the secondary MCLs, which are limits based on aesthetic, organoleptic standards, are also incorporated into this permit to protect groundwater quality.

27. ***Title 22 of the California Code of Regulations*** – The California Department of Health Services established primary and secondary maximum contaminant levels (MCLs) for inorganic, organic, and radioactive contaminants in drinking water. These MCLs are codified in Title 22, California Code of Regulations (Title 22). Title 22 primary MCLs (see Attachments A-1 to A-5, and A-7) have been used as bases for effluent limitations of the RO recycled water in WDRs and WRRs permit to protect the **Groundwater Recharge** beneficial use when that receiving groundwater is designated as municipal and domestic supply.

Groundwater Recharge – RO recycled water from the District's Plant through the Barrier enters the west Coast Groundwater Basin. Since ground water from this Basin is used to provide drinking water to 830,000 people, Title 22-based limits are needed to protect that

drinking water supply where there is reasonable potential for the contaminant(s) to be present in the injection recharge water. By limiting the contaminants in the RO recycled water injection, the amount of pollutants entering the groundwater basins are correspondingly reduced. Once groundwater basins are contaminated, it may take years to clean up, depending on the pollutant. Compared to surface water pollution, investigations and remediation of groundwater are often more difficult, costly, and extremely slow.

28. ***Antidegradation Policy*** – On October 28, 1968, the State Board adopted Resolution No. 68-16, *Maintaining High Quality Water*, which established an antidegradation policy for State and Regional Boards. The State Board has, in State Board Order No. 86-17 and an October 7, 1987 guidance memorandum, interpreted Resolution No. 68-16 to be fully consistent with the federal antidegradation policy. As a result, the federal antidegradation policy provides some guidance in interpreting State Board Resolution No. 68-16.The State policy is designed to ensure that a water body will not be degraded resulting from the permitted discharge, except under the conditions established in the State Antidegradation Policy. The provisions of this Order are consistent with the antidegradation policy.

In conformance with State Antidegradation Policy, the Regional Board could choose to adopt limits of "nondetect" for anthropogenic Chemicals of Concern where no scientific or regulatory criteria exist. The Antidegradation Policy is an important regulatory tool for the Regional Board and it provides a backstop where knowledge of contaminants is evolving that requires "the highest water quality consistent with the maximum benefit to the people of the State will be maintained." (SWRCB Res. No. 68-16, ¶ 3.) The loading of anthropogenic compounds to underground aquifers is particularly problematic. Waste discharged into underground aquifers is technically difficult to remove and can be extremely costly to remediate. Moreover, a contaminated groundwater resource may become unsuitable for beneficial use, and may become unsuitable for a lengthy period of time. As a result, the State Antidegradation Policy's command to maintain "the highest water quality consistent with the maximum benefit to the people of the State" requires particular sensitivity when considering allowing reclaimed water containing waste to be injected into a groundwater aquifer.

To maintain the highest water quality, the Regional Board could specify limitations based on the non-detect levels for anthropogenic compounds because that would provide assurance that aquifer's water quality was being maintained. Instead, Regional Board staff are taking a middle ground and relying on the best available science to maintain the highest water quality consistent with the maximum benefit to the people of the State. Regional Board staff used the existing science, as explained in Finding 23.D., to develop limits protective of beneficial uses of the groundwater based upon their professional judgement. This approach is also consistent with State Board Resolution No. 77-1 (concerning water reclamation) and recognizes the important role the Expansion Phase III Project will play in protecting and enhancing groundwater resources.

29. ***Beneficial Uses*** – In the Basin Plan, the beneficial uses of the West Coast Groundwater Basin are municipal and domestic supply, industrial service supply, industrial process supply, and agricultural supply.

30. The State Board adopted Resolution No. 77-1, Policy with Respect to Water Reclamation in California, which includes principles that encourage and recommend funding for water

recycling and its use in water-short areas of the State. On September 26, 1988, the Regional Board also adopted Resolution No. 88-012, *Supporting Beneficial Use of Available Reclaimed Water in Lieu of Potable Water for the Same Purpose,* which encourages the beneficial use of recycled wastewater and supports water recycling projects.

31. Section 13523 of the California Water Code provides that a Regional Board, after consulting with and receiving recommendations from DHS, and after any necessary hearing, shall, if it determines such action to be necessary to protect the public health, safety, or welfare, prescribe water recycling requirements for water that is used, or proposed to be used, as recycled water. Groundwater recharge of freshwater aquifers with recycled water could affect the public health, safety, or welfare; therefore requirements for such use are necessary.

32. Section 13523 further provides **at a minimum**, that the recycling requirements shall include, or be in conformance with, the statewide water recycling criteria established by DHS pursuant to Water Code Section 13521. DHS adopted revised Water Recycling Criteria (Chapter 3, Division 4, Title 22, California Code of Regulations) that became effective on December 2, 2000. Applicable criteria to this recycling Expansion Phase III Project are prescribed in this Order.

33. Section 60320 of the Water Recycling Criteria provides that DHS' recommendations to the Regional Water Quality Control Boards for proposed groundwater projects and for expansion of existing projects will be made on an individual case basis where the use of recycled water involves a potential risk to public health.

34. Section 60320 further provides that DHS' recommendations will be based on relevant factors of each project, including the following: treatment provided, effluent quality and quantity, spreading area operations, soil characteristics, hydrogeology, residence time, travel time, and distance to withdrawal.

35. Section 13540 of the Water Code requires that recycled water may only be injected into an aquifer used as a source of domestic water supply if DHS finds the recharge will not degrade the quality of the receiving aquifer. To facilitate determination of whether a recharge project will not degrade the receiving groundwater, DHS has developed draft Recycling Criteria for Groundwater Recharge Reuse (latest version is dated December 1,2004). Compliance with the requirements in the criteria would likely not result in degradation of the receiving groundwater.

36. Prior to submitting its recommendations, DHS reviewed reports and studies on the project including a *West Basin Water Recycling Program Engineering Report* (dated March 1993), a *West Coast Basin Groundwater Flow and Transport Model Post Audit Report – West Basin Recycled Water Program* (dated January 2000), a *West Basin Water recycling Plant West Coast Basin Barrier Project Expansion Phase III Amended Engineering Report* (dated March, 2002), and other supplemental information and responses to the DHS pertaining to the WCBBP. After the review, DHS conducted a public hearing on the West Coast Basin Barrier Expansion Phase III Project on December 10, 2002 in El Segundo, California, to consider the Expansion Phase III Project. There was no testimony in opposition to the Expansion Phase III Project.

37. The Regional Board has consulted with DHS regarding the proposed groundwater recharge with recycled water. DHS submitted its Findings of Fact to the Regional Board, in a letter dated December 15, 2004, to adopt waste discharge and water recycling requirements for the recharge Expansion Phase III Project. The major DHS' recommendations and requirements in the Findings of Facts are shown in Table P5.

Table P5 – Recycling Criteria for Groundwater Recharge Reuse

Factors	Minimum Requirements
Recycled water contribution (RWC)	The maximum RO recycled water recharged shall not exceed 12.5 MGD (or 75% of total blended water injected) and 17.5 MGD (100% of RO recycled water injected) for the initial operation period and the ultimate stage, respectively. These percentages will be calculated based on the running-monthly-average RO RWC for the preceding period up to 60 months.
Minimum retention time underground[1]	At least 12 months prior to extraction from domestic supply wells.
Horizontal separation requirements[1]	At least 2,000 feet between point of recycled water direct injection and domestic water supply wells.
Additional Monitoring well requirements[2]	One additional monitoring well was constructed between the Barrier and 3-month travel time from recharge area between the Barrier and the nearest downgradient domestic water Manhattan Beach Well No. 11a.
Total nitrogen[3]	The total nitrogen concentration shall not exceed 5 mg/L in the recycled water.
Total organic carbon[4]	The total organic carbon concentration of the recycled water shall not exceed 0.5 mg/L divided by the maximum average RWCs, which are 0.75 and 1 for 75% and 100% recycled water projects, respectively.

Footnote:

[1]. The importance of the retention time and the physical setback is based on the concept that water moving through the aquifers is afforded an extra level of treatment through soil filtration; the longer the water stays underground, the more likely trace organic and inorganic chemicals would be removed through the filtration process. In addition, virus decay with time and a 12-month retention time provides a necessary log reduction in the virus density in the recycled water.

[2]. The wells shall be installed such that samples can be obtained independently from each aquifer potentially conveying the recharge water. Monitoring well locations shall be determined based on a numerical model, tracer, or other method to determine the estimated underground travel time from the recharge operation to the monitoring well sites. In addition, Construction of the wells shall be such that samples can be obtained independently from each aquifer conveying the recharge water.

[3]. Total nitrogen shall be defined as the sum of ammonia, nitrite, nitrate, and organic nitrogen concentrations, expressed as nitrogen.

[4]. Total organic carbon means oxidizable organic carbon measured by an approved laboratory pursuant to subsection 64415(a) using modified Method 5310C, *Standard Methods for the Examination of Water and Wastewater, 20th Edition, 1998*, with a reporting level of 0.10 mg/L, and precision and accuracy within plus-and-minus 20 percent.

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38. Regulatory agencies who issue well permits have adopted policies to prohibit or to consult with the DHS and the District before issuing permits for the construction of new wells for domestic purposes within 2000 feet of the Barrier. On December 19, 1994, the Board of Directors of the District adopted Ordinance No. 94-28 directing the District's staff to recommend against drilling of any new domestic water production wells within 2000 feet of the Barrier.

39. The requirements contained in this Order are in conformance with the goals and objectives of the Basin Plan and implement the requirements of the California Water Code and Water Recycling Criteria.

CEQA AND NOTIFICATION

40. The District authorized preparation of an Initial Study/Proposed Mitigated Negative Declaration by CDM in June 2002, in compliance with the California Environmental Quality Act (CEQA) (Public Resources Code Section 21000, et seq.). The Initial Study did not reveal any significant environmental impacts. The Initial Study/Proposed Mitigated Negative Declaration was released for public comment on June 13, 2002, with an advertisement in the Daily Breeze, mailings to interested agencies and circulation through the State Clearinghouse (#2002061102). No negative comments were received and the conclusion that there were no significant environmental impacts was the basis for the Notice of Determination and adoption of a Negative Declaration by the District Board of Directors on August 26, 2002. No further comments or objections were received during the subsequent 45 days. Therefore, the project has completed the notification and review process required by the CEQA.

41. This issuance of water recycling requirements by a regulatory agency for the protection of the environment is exempt from the provisions of Chapter 3 [commencing with Public Resources Code Section 21100, et seq., Division 13, CEQA] in accordance with Section 15308, Title 14, California Code of Regulations.

42. Pursuant to California Water Code section 13320, any aggrieved party may seek review of this Order by filing a petition with the State Board. A petition must be sent to the State Water Resources Control Board, 1001 I Street, Sacramento, California, 95814, within 30 days of adoption of the Order.

The Regional Board has notified the Project Sponsors and interested agencies and persons of its intent to issue Waste Discharge and Water Recycling Requirements for the proposed West Coast Basin Barrier Project – Expansion Phase III Project, and has provided them with an opportunity to submit their written views and recommendations.

The Regional Board, in a public meeting, heard and considered all comments pertaining to the discharge and to the requirements.

IT IS HEREBY ORDERED that the West Basin Municipal Water District and the Los Angeles County Department of Public Works shall comply with the following requirements:

I. WASTEWATER TREATMENT AND SOURCE CONTROL

Any noncompliance or violation with these requirements, unless otherwise specifically provided, the Project Sponsors shall notify and submit a report according to Provision VII.5. of this Order.

1. Treatment of wastewater intended for groundwater recharge injection shall be as proposed in the Findings of this Order and shall consist of preliminary and primary sedimentation, secondary biological treatment, and advanced wastewater treatment (comprising of automatic strainer, MF, RO, AOP, post-decarbonation, lime, or other stabilization). Replacement of equipment or major modifications to the treatment process as described in this Order and in the *West Basin Water Recycling Program Engineering Report* (March 1993) and the *West Basin Water recycling Plant West Coast Basin Barrier Project Expansion Phase III Amended Engineering Report* (May 2002), both prepared by the District, and other supplemental information on this project shall be subject to review and approval by DHS and this Regional Board.

2. There shall be no bypassing of the treatment processes described in this Order, except for post-decarbonation and lime stabilization as needed for pH adjustment.

3. The District shall operate the SCIP for the proactive source control approved by the DHS in October 2005, in such a manner as to minimize the likelihood of contamination of the wastewater with toxic chemicals that will be passed through the treatment system. If the DHS identifies any contaminants that may pose a risk of contamination to a drinking water supply, it may designate those contaminants for inclusion in the above program's requirements for the West Basin Water Recycling Plant to minimize the possibility of these contaminants entering the source water to the Expansion Phase III Project. The SCIP shall include, but is not limited to the following elements:

   A. Monitoring of influent from Hyperion;

   B. A program for maintaining an inventory of compounds discharged into the City's wastewater collection system so that new compounds of concern can be evaluated rapidly;

   C. Spike or seed studies on full scale demonstration unit being constructed to test for constituents of concern determined by the DHS and this Regional Board;

   D. Investigation program focused on the identified target compounds and their potential ability to persist through the treatment systems;

   E. Cooperative Memorandum of Agreement with the City to address the source(s) of persistent constituents of concern, including evaluation of all chemicals and parameters listed in Attachment 1, and develop an comprehensive outreach program; and,

F. Time schedule for implementation of the preceding elements.

All above elements must be implemented prior to increasing the monthly running average RO RWC to 100 percent. The agreement shall become effective 90 days after review and approval by the Regional Board Executive Officer and DHS.

II. WEST BASIN WATER RECYCLING PLANT INFLUENT SPECIFICATIONS

For purposes of this Order, the Plant includes automatic strainer, MF, RO, AOP, post-decarbonation, lime stabilization treatment. The influent to the Plant shall be secondary treated effluent generated at Hyperion and shall, at all times, be adequately oxidized. The influent shall be considered adequately oxidized when it meets the following characteristics, based on monthly average:

1. The Carbonaceous Biochemical Oxygen Demand value ($CBOD_5$ 20°C) does not exceed 25 mg/L. Compliance shall be determined monthly using the average of the analytical results of all 24-hour composite samples taken at least weekly during the month.

   In a letter dated May 12, 2000, the DHS has endorsed the District's proposal that the influent limit should be based on CBOD instead of BOD.

2. The Total Suspended Solids (TSS) concentration does not exceed 30 mg/L. Compliance shall be determined monthly using the average of the analytical results of all 24-hour composite samples taken daily during the month.

III. RECYCLED WATER SPECIFICATIONS

1. Recycled water used for injection is wastewater that has received preliminary, primary, and secondary treatment, followed by automatic strainer, MF, RO, AOP, post-decarbonation, lime stabilization.

2. Recycled water used for injection shall be, at all time, adequately oxidized, filtered, disinfected, and subject to organics removal by RO and UV treatment. There shall be no bypassing of any treatment process, except for decarbonation and lime addition, which provide pH adjustment as required for stabilization in the above statement of Section III.1.

3. Turbidity - The turbidity of the reverse osmosis product water prior to disinfection shall not exceed 0.2 NTU more than 5 percent of the time within a 24-hour period and 0.5 NTU at any time. The turbidity shall be continuously measured with at least one reading every 1.2 hours and recorded. The results of the daily average turbidity determinations shall be reported quarterly to DHS and the Regional Board. Compliance with the daily average turbidity shall be determined based on using the recorded turbidity taken at intervals of no more than 1.2 hours over a 24-hour period. Should the continuous turbidity meter and recorder fail, grab sampling at a minimum frequency of 1.2 hours may be substituted for a period of up to 24 hours. When the turbidity requirements are exceeded, delivery of recycled water shall be suspended until such time the cause of the exceedance has been identified and corrected. Any failure to meet the turbidity

performance requirements shall be reported to the DHS and the Regional Board in the next report.

4. Total Organic Carbon

A. The total organic carbon (TOC) of the recycled water shall not exceed 0.5 mg/L divided by the maximum average RWC.

B. Each week a grab sample of RO recycled water shall be collected for TOC analysis. Determination of compliance shall begin as soon as four samples have been collected, averaging all available samples up to 20 samples. After that time, compliance with this requirement shall be determined as the most recent 20 samples calculated monthly. In the event of a violation of the TOC requirement, the Project Sponsors shall suspend recharge until the requirement is met. Within 7 days of the suspension, the Project Sponsors shall notify DHS and this Regional Board.

If the average of the last 4 samples exceeds the TOC limit, the Project Sponsors shall submit a report within 60 days to DHS and this Regional Board describing the cause(s) of the exceedance and the corrective actions implemented and/or to be implemented to avoid future exceedances.

5. Total Nitrogen

A. The total nitrogen concentration shall not exceed 5 mg/L divided by the maximum average RWC.

B. The total nitrogen shall be defined as the sum of ammonia, nitrite, nitrate, and organic nitrogen concentrations, expressed as nitrogen.

C. The weekly average of total nitrogen concentration in the recycled water, or the blend with diluent* water if blended before injection, shall not exceed 5 mg/L as nitrogen, based on results of analysis of 2 grab or 24-hour composite samples per week, obtained at least 3 days apart. The laboratory shall complete each analysis with standard methodologies/US EPA holding times. If sum of ammonia, nitrate plus nitrite results exceed 2.8** mg/L, then total Kieldahl nitrogen (TKN***) must be analyzed within 48 hours. If the results of the total nitrogen concentration in any single sample exceed 5 mg/L as nitrogen, the laboratory must report the result to the District within 72 hours of completion of the results. If the average of two consecutive samples exceeds 5 mg/L as nitrogen, the District shall:

a. Investigate the cause and make appropriate corrections;

b. Within 24 hours of being notified by the laboratory, notify DHS and the Regional Board and submit a report according to Provision VII.5. of this Order; and,

c. Suspend injection of the recycled water until appropriate corrections are made to reduce total nitrogen levels to below 5 mg/L, if the average of all samples collected over the ensuing two-week period exceeds 5 mg/L.

d. Suspend injection of the recycled water until appropriate corrections are made to reduce total nitrogen levels to below 5 mg/L, if more than 25% of all samples collected over the ensuing two-week period exceeds 10 mg/L.

e. Submit a report to the DHS and the Regional Board within 30 days of conclusion of enhanced groundwater monitoring, summarizing the results of the enhanced groundwater monitoring program and describing the causes of the exceedance and corrective actions taken to avoid future violations of these requirements.

*: Diluent water is water that **is not** treated wastewater and that is used to supplement the recycled water in the Barrier. In addition, diluent water must be equivalent to potable water quality and be approved for use by the DHS and the Regional Board.

**: The nitrogen effluent date between 10/2003 and 09/2005 provided by the District show nitrate: 0.10-0.69 mg/L, nitrite: ND, TKN: 1.0-2.2 mg/L, ammonia: 0.23-2.3 mg/L, total organic nitrogen: ND-1.13 mg/L, and total nitrogen: 0.69-2.48 mg/L. In general, the nitrogen concentrations in the RO recycled water are very low. Regional Board staff suggest that the highest concentration TKN of 2.2 mg/L ever detected should be deducted from total nitrogen concentration of 5 mg/L. This, somehow, ensures the water quality of the RO recycled water and blended water.

***: The DHS is currently awaiting another revision of the Draft Groundwater Recharge Reuse Regulations and has noted that they may be addressing TKN turn around time issue for systems with low levels of nitrate, nitrite and ammonia. The District shall send a letter to the Regional Board Executive Officer to request modifications the permit in order to match the TKN Language in the next draft regulation version.

D. Diluent water shall be monitored quarterly for nitrate and nitrite. Within 48 hours of being informed by the laboratory of a nitrate and/or nitrite result greater than a maximum contaminant level, a confirmation sample shall be collected and analyzed. If the average of the initial and confirmation samples exceeds a maximum contaminant level:

a. The District shall notify the DHS and Regional Board within 48 hours of receiving the confirmation sample result.

b. The causes of the exceedance shall be investigated and appropriate corrections shall be made.

c. Each week the District shall collect and analyze two grab or 24-hour composite samples at least 3 days apart.

d. If the average of all samples collected over the ensuing 2-week period exceeds the applicable criterion, recharge of the recycled water shall be suspended until appropriate corrections are made.

6. Recycled water shall be, at all times, adequately disinfected. In the event that the recycled water exceeds any of the following, based on daily grab samples, the Project Sponsors shall suspend injection of recycled water until such time the cause of the failure has been identified and corrected. Any failure to meet the total coliform performance requirements shall be reported to the DHS and the Regional Board in the next monthly report.

A. A 7-day median of 2.2 most probable number (MPN) per 100 milliliters for two consecutive days;

B. 23 MPN per 100 milliliters in more than one sample in any 30-day period prior to injection; and,

C. 240 MPN per 100 milliliters in any sample prior to injection.

7. The conductivity of the RO treated recycled water upstream of the UV system shall not exceed 300 μS/cm at any time. The conductivity of the RO treated recycled water shall be continuously measured with an online conductivity meter and recorder. At any time the conductivity limit is exceeded, the Plant will be shut down automatically and result in the suspension of injection of recycled water until such time that the cause of the high-conductivity condition has been identified and corrected.

8. The pH of the product water for injection or recharge water shall be, at all times, within the range of 6.5 to 8.5 pH units. Excursion from this range shall not be considered a violation provided the duration is not more than 10 minutes in a 24-hour period, and pH shall at all times be within 6 to 9.

9. Concentrations of contaminants in the recycled water shall, at all times, not exceed the following DHS' MCLs for drinking water and limits for Chemicals of concern to the Regional Board. These limits are prospective, new state and federal MCLs will be added as they are adopted. Compliance with primary MCLs and limits for Chemicals of Concern to the Regional Board shall be determined on the basis of a running quarterly average by analyzing a 24-hour composite or grab sample, calculated each quarter using the previous four quarters of data. Compliance with secondary MCLs shall be determined annually based on a representative grab sample or the average of samples collected during the year, if more than one. In case of a violation of any of either primary, or secondary MCLs, the Project Sponsors shall notify and submit a report according to Provision VII.5. of this Order.

A. Primary MCLs specified in Chapter 15, Domestic Water Quality and Monitoring, Title 22, California Code of Regulations (CCR):

a. Inorganic chemicals in Section 64431, Table 64431-A, except for nitrogen compounds, Attachment A-2 of this Order;

b. Radionuclides in Section 64443, Table 4, Attachment A-3 of this Order;

c. Regulated organic chemicals in Section 64444, Table 64444-A, Attachment A-4 of this Order; and,

B. Primary MCLs for disinfection byproducts specified in Chapter 15.5, Article 2, Section 64533, Table 64533-A, Attachment A-5 of this Order

C. Secondary MCLs in Chapter 15, Domestic Water Quality and Monitoring, Title 22, CCR, Table 64449-A, Attachment A-7 of this Order. The Corrosivity Index in Table 64449-A is not applicable for 100% recycled water. The Corrosivity Index after adding lime to the recycled water should be within ± 0.5 Langelier Saturation Index (LSI).

D. Any new Federal or State MCL upon adoption.

E. Concentrations of Chemicals of Concern to the Regional Board shall not exceed the limits outlined on Attachment A-8 of this Order.

10. Recycled water shall not contain lead in concentrations greater than 0.015 mg/L.

11. Recycled water shall not contain copper in concentrations greater than 1.0 mg/L (2nd MCL), which is the most stringent drinking water standard.

12. Concentrations of mineral constituents in the recycled water injected into the Barrier shall not exceed the limits identified in Table P6.

Table P6 – Concentrations of Mineral Constituents in the Recycled Water Injected into the west Coast Barrier

Constituent	Unit	Limit
Total dissolved solids	mg/L	800
Sulfate	mg/L	250
Chloride	mg/L	250
Boron	mg/L	1.5

13. Compliance with primary and secondary MCLs will be determined as described in parts A and B below. Should an exceedance of permit limits occur, the District shall investigate the cause(s) and submit a report to DHS and this Regional Board within 60 days of the exceedance describing the cause(s) and remedial and/or corrective actions implemented or to be implemented with a time schedule.

A. Compliance with primary MCLs referenced above for inorganic chemicals, radionuclides, organic chemicals, and disinfection byproducts and action levels for lead and copper, shall be based on the running-quarterly average, calculated each

quarter using the previous four quarters of data.

B. If the single sample result (or average of samples collected during the year, if more than one) exceeds a secondary maximum contaminant level.

14. Recycled water temperature shall not exceed 100°F at any time.

IV. RECYCLED WATER CONTRIBUTION (RWC), RETENTION TIME AND HORIZONTAL SEPARATION REQUIREMENTS

1. During the initial operating period, the total volume of RO recycled water recharged by injection shall not exceed 12.5 MGD (approximately 14,000 AFY) or 75% RO RWC. Following the successful completion of the initial operating period below, the District may increase the monthly running average RO RWC to 100% or 17.5 MGD (approximately 19,600 AFY), if the following are documented in a report submitted to and approved by the DHS:

   A. The initial operating period shall be defined by injection of blended water that has reached at least one barrier monitoring well for at least one year with an average RWC of at least 60% RO recycled water and the District has been in compliance with the existing DHS-specified maximum average RWC of 75%;

   B. Operation, monitoring, and compliance data;

   C. RO recycled water quality produced at the Plant has consistently met all requirements;

   D. Appropriate construction and siting of the monitoring well used in the demonstration have been validated;

   E. An updated engineering report;

   F. Review and assessment of the increased RO RWC by a scientific peer advisory panel;

   G. Water quality data collected at the WB-1 monitoring well used in the demonstration as follows:

      a. Meets all primary drinking water standards specified in Section III.9;

      b. Meets the total nitrogen criteria specified in Section III.5; and,

      c. Indicates that the non-regulated contaminants, including TOC and those specified in Tables 64449-A and 64449-B, total coliforms levels, and any endocrine disrupting chemicals, pharmaceuticals, or other water quality constituents specified by the DHS based on the results of the receiving water monitoring are not increasing over the levels in the RO recycled water due to the recharge operation.

2. Diluent for the Barrier shall be imported treated drinking water.

3. Compliance of the RWC and total volume of RO recycled water injected shall be as follows:

   A. During the initial operating period, the RWC shall be on a monthly running average basis over a time period up to a maximum of the preceding 60 months. Once a month, the average RWC shall be calculated during this period by dividing the total volume of recycled water injected during the preceding months by the total volume of injection during that period.

   B. The total volume of RO recycled water injected shall be based on a monthly average.

   For the initial operating period, if the average receiving water contribution exceeds 75 percent, or the total volume of RO recycled water injected exceeds 12.5 MGD (initial period) and 17.5 MGD (ultimate period), the District shall notify DHS and the Regional Board within 7 days and submit a report within 60 days of knowledge of exceedance according to Provision VII.5.

4. Any recycled water that may already be present in the groundwater because of on-going project related activities should be accounted for as a part of the total amount of recycled water in calculating the percent of recycled water in an aquifer.

5. Upon approval by the DHS and the Regional Board, the District shall implement the groundwater and tracer monitoring programs to track the movement of recycled water through the aquifer systems. After the first year of operation and annually thereafter, using the results of the groundwater and tracer monitoring programs, the District shall determine the amount of recycled water entering each individual aquifer, where recycled water is, the RWC and time of travel of recycled water.

6. Recycled water shall be retained underground for a minimum of 12 months, prior to extraction at any domestic water supply well.

7. A minimum horizontal separation between the point where recycled water or blend of recycled water and diluent water is injected and a domestic water supply well shall be at least 2,000 feet. No new domestic drinking water wells shall be allowed to extract from the Lower San Pedro aquifer and all of the other aquifers in the area between 2,000 feet from the Barrier. The District shall coordinate with the DHS against issuing permits for new domestic water production wells within 2,000 feet from the Barrier.

V. ULTRAVIOLET LIGHT SPECIFICATIONS

1. UV disinfection shall comply with the "Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse" (May 2003) published by the National Water Research Institute, which specifies for RO permeate that:

A. The design UV does shall be at least 50 millijoules per square centimeter (mJ/cm^2) under maximum day flow;

B. The effluent turbidity shall be equal to or less than 0.2 NTU 95% of the time, and not to exceed 0.5 NTU at any time; and,

C. The RO permeate UV transmittance shall be 90% or greater at 254 nm.

2. Based on October 29, 2004 DHS' Memorandum to the Regional Board, the District shall:

A. Establish quartz sleeve cleaning frequencies as defined in the OMP Plan that ensure the minimum required UV does delivery is consistently met;

B. Use a fixed cleaning frequency to define the quartz sleeve cleaning intervals when high organic matter is present as defined in the OMM Plan; and,

C. Not use the presence of coliform organisms in the RO-treated effluent as a factor to determine cleaning intervals.

The above cleaning frequencies shall be established on a site-specific basis in consultation with the DHS.

3. The District shall perform fouling tests each month during the first year of operation, if notable reduction in intensity, and submit results of the testing to the DHS and Regional Board for review and approval and shall be included in the updated version of the PMM Plan that following year.

VI. GROUNDWATER MONITORING WELLS AND PROGRAMS

1. The Project Sponsors establish an additional, as a minimum, 3-month groundwater monitoring well WB-1 at location between the Barrier injection wells and the nearest domestic water supply Manhattan Beach Well No. 11a, in compliance with Minimum Retention Time and Horizontal Separation Requirements of Finding 37. Samples shall be taken independently from for 200-Ft, Silverado, and Los San Pedro aquifers, respectively.

2. The groundwater monitoring program shall be periodically reviewed and modified, based on results of the monitoring program. Changes to the monitoring program, including monitoring well locations, shall be approved by the Regional Board and the DHS.

VII. PROVISIONS

1. The Project Sponsors shall delineate the responsible party or parties to comply with the specific requirements in this Order including the Monitoring and Reporting Program (see MRP). This information shall be provided, in writing and signed by the two Project Sponsors, to the Regional Board Executive Officer within 45 days of the effective date of this Order. This delineation will facilitate effective communication between the Project Sponsors and the Regional Board. However, the Project Sponsors are individually, and

collectively, responsible for compliance with this Order.

2. Any injection or discharge of recycled water, or a blend of recycled water and diluent water, at any point(s) other than the 153 wells in the Barrier and except as provided for in Provision VII.8 of this Order, is prohibited and constitutes a violation of this Order.

3. The recharge of recycled water into the Barrier shall not cause degradation of the groundwater basins. If at any time, the injection of recycled water is determined to be adversely impacting the receiving groundwater, the injection of the recycled water shall be suspended immediately but not later than 24 hours of knowledge of the adverse impact. The District shall notify DHS and the Regional Board according to Provision VII.5.

   RO recycled water that does not meet permit requirements for the injection wells but meets the requirements for discharge from Hyperion to the Pacific Ocean can be discharged directly to the Pacific Ocean under the provisions of the Hyperion NPDES. If RO recycled water does not meet NPDES permit requirements for the Hyperion discharge to the ocean, the Plant shall be shut down and any off-spec water in storage shall be sent to Title 22 treatment train for treatment.

4. If the District or the DHS determines that a well is no longer usable as a safe, wholesome, and potable source of drinking water because it exceeds drinking water quality regulations, and if the cause of this condition is a result of the recharge Expansion Phase III Project, the District shall within 24 hours notify the owner of the well to discontinue using the well and shall implement the approved plan for providing an alternative source of domestic water supply pursuant to District Resolution No. 3-04-800, or a DHS approved treatment mechanism. The District shall also notify as soon as possible the DHS and the Regional Board according to Provision VII.5.

5. For any violation of requirements in this Order, the District shall notify DHS and the Regional Board within 24 hours of knowledge of the violation either by telephone or electronic mail. This notification shall be followed by a written report within 7 days of notification, unless otherwise specified in this Order. The report shall include, but not limited to, the following information, as appropriate:

   A. Nature and extent of the violation;

   B. Date and time: when the violation started, when compliance was achieved; and, when injection was suspended and restored, as applicable.

   C. Duration of violation;

   D. Cause/s of violation;

   E. Corrective and/or remedial actions taken and/or will be taken with time schedule for implementation; and

   F. Impact of the violation.

6. After a year of injecting recycled water into the Barrier, the District shall update the OMM Plan and submit it to DHS for review and approval. Significant changes to the OMM Plan must be approved by DHS prior to implementation. The District shall furnish the Regional Board with a copy of the approved OMM Plan within 30 days of DHS approval. The Plant shall be operated in accordance with the approved OMM Plan.

   The OMM Plan shall cover critical operational parameters to include routine testing procedures for the automatic strainers, MF, RO, and AOP, optimization of the UV dose for disinfection and reduction of light-sensitive contaminants, and all treatment processes, maintenance and calibration schedules for all monitoring equipment, process alarm set points, and response procedures for all alarms in each treatment process of the Plant, including criteria for diverting recycled water if water quality requirements are not met, start-up, emergency response and contingency plans. During the first year of operation of the Expansion Phase III Project, all treatment processes shall be optimized to reduce contaminant levels. The results of these initial optimization efforts shall be incorporated into the updated OMM Plan. The OMM Plan shall include staffing levels with applicable certification levels for Expansion Phase III Project operations personnel. Significant changes in the operation of any of the treatment processes shall be reported to the DHS and the Regional Board. Significant changes in the approved OMM Plan, which may include provisions to comply with Condition 4 in DHS' December 15, 2004 Findings of Fact, must be approved by the DHS and the Regional Board prior to instituting changes.

7. For any material change or proposed change in character, location or volume of recycled water, or its uses, the District shall submit at least 120 days prior to the proposed change an engineering report or addendum to the existing engineering report to the Regional Board and DHS [pursuant to California Water Code, section 13522.5 and CCR, Title 22, Section 60320.080] for approval. The Engineering Report shall be prepared by a qualified engineer and geologist who are experienced in groundwater recharge, both registered or certified in the State of California. However, replacement or addition of injection wells to the Barrier will not require a report of material change, or filing of a new Report of Waste Discharge, provided:

   A. the additional injection capacity does not violate any requirement in this Order;

   B. at least 30 days prior to installation, the District submit in writing the purpose and location of the wells to DHS and the Regional Board; and,

   C. within 90 days after the installation of the wells, the LACDPW submit in writing the complete geologic and electrical logs and as-built construction diagrams of the injection wells to DHS and the Regional Board.

8. This Order includes "Standard Provisions Applicable to Waste Discharge Requirements" (Standard Provisions - Attachment W). In the event of conflict between provisions stated herein and the Standard Provisions, the provisions stated herein prevail.

9. This Order includes Monitoring and Reporting Program No. CI-7485 (MRP). In the event of conflict between provisions stated in the MRP and the Standard Provisions, the

provisions in the former prevail.

10. The District shall provide an Annual Report described in the MRP to this Regional Board, DHS, and all downgradient public drinking water systems of production wells.

11. In order to limit the presence of contaminants in the recycled water including regulated and unregulated contaminants identified in Attachments A-2 to A-5 and A-7 to A-9, the District shall, for the purposes of protecting public health, ensure that its equipment and facilities for treatment operate at levels of peak performance. In addition, LACDPW also needs to ensure that its equipment and facilities for recharge shall operate at levels of peak performance.

12. Every five years, the District shall update the engineering report and submit it to this Regional Board and DHS for approval.

13. The requirements in this Order do not exempt the Project Sponsors from complying with any other laws, regulation, or ordinances, which may be applicable. This Order does not legalize Hyperion, the Plant, or the Barrier, and it leaves unaffected any further constraint on the use of recycled water that may be contained in other statutes or required by other agencies.

14. This Order does not alleviate the responsibility of the Project Sponsors to obtain other necessary local, State, and Federal permits to construct facilities necessary for to comply with this Order; nor does this Order prevent imposition of additional standards, requirements, or conditions by any other regulatory agency.

15. An independent advisory panel* shall provide scientific peer review prior to 100% recycled water project. Members of the advisory panel, as a minimum, shall have expertise in the fields of toxicology, engineering geology or hydrogeology, microbiology, chemistry, and engineering with experience in the fields of wastewater treatment and public water supply. The engineer and the engineering geologist or hydrogeologist shall be registered in California.

    *: An independent advisory panel, not necessarily the same one as listed in this paragraph but maybe a similar group, meets on a periodic basis to review the annual reports and five year reports to determine how the project is performing based on the recommendations from the advisory panel and the DHS Groundwater Recharge Reuse Draft Regulations and the Order issued by the Regional Board.

16. Prior to onset of operation, the District shall have in place a resolution adopted by its governing board that it will be responsible for developing a plan for providing an alternative source of domestic water supply, or a DHS approved treatment mechanism, to any user whose domestic water well is found to violate California drinking water quality regulations as a direct result of the Expansion Phase III Project, or when the DHS makes an analysis and finding that the domestic water well is unsuitable for human consumption as a direct result of the Expansion Phase III Project. Such alternative sources can include water deliver for blending of the producing well, imported water, water produced at a well head treatment plant, and water produced from new wells. The

District shall notify the DHS in a timely manner, when such a determination is made.

VIII. GENERAL REQUIREMENTS

1. A copy of this Order shall be maintained at Hyperion, the Plant, and the District offices so that this Order is available at all times to operating personnel.

2. The Project Sponsors shall, at all times, properly operate and maintain all treatment facilities and control systems, transmission and injection facilities and related appurtenances, which were constructed and installed or used by the Project Sponsors to achieve compliance with the requirements of this Order. Proper operation and maintenance includes: effective performance testing, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls (including appropriate quality assurance and control procedures.

3. A Wastewater Treatment Plant Operator, or a Water Treatment Plant Operator, with at least Grade V certificate shall inspect the Plant on a regular basis to ensure that all unit treatment processes are working properly and that the recycled water from the Plant is in compliance with this Order.

4. Supervisors and operators of Plant shall possess a certificate of appropriate grade as specified in Title 23, California Code of Regulations, Section 3680 or subsequent revisions.

5. The District shall enter into a legal agreement (MOA) with the City of Los Angeles that implements the District Source Control Implementation Plan (SCIP) as approved by the DHS. The SCIP shall include how the District shall conduct:

   A. An assessment of the fate of the specified contaminant compounds through the wastewater and recycled water treatment systems.

   B. A source investigation and monitoring program focused on the specified contaminants and their potential ability to persist through the treatment systems.

   C. A comprehensive outreach program to industrial, commercial and residential communities within the sewage collection agency's service are to manage and minimize the discharge of compounds of concern at the source.

   D. A proactive program for maintaining an inventory of compounds discharged into the wastewater collection system so that new compounds of concern can be evaluated rapidly.

6. The District shall provide standby or emergency power facilities and/or sufficient storage or diversion capacity or other means such that in the event of power outages or plant upset or other causes, the discharge or injection of raw or inadequately treated wastewater does not occur.

7. The District through a comprehensive monitoring program (see MRP) should continue to assure that the recycled water produced at the Plant for injection into the groundwater in the Barrier is not contaminated with toxic chemicals of industrial origin.

8. Adequate facilities shall be provided to protect Hyperion, the Plant, and Barrier injection system from damage by storm flows and runoff.

9. Neither the wastewater treatment nor injection of recycled water shall cause a condition of pollution or nuisance as defined in section 13050 of the California Water Code.

10. The injection of recycled water shall not result in earth movement in geologically unstable areas.

11. Injection of recycled water shall not impart tastes, odors, color, foaming, or other objectionable characteristics to receiving groundwater.

12. Injection of recycled water shall not cause a violation of any applicable water quality standard for receiving groundwater adopted by this Regional Board or the State Board.

13. In the event of any change in name, ownership, or control of Hyperion, the Plant, and the Barrier injection facilities, the Project Sponsors shall notify DHS and this Regional Board of such change and shall notify the succeeding owner or operator of the existence of this Order by letter, a copy of which shall be forwarded to the Regional Board at least 30 days prior to the change.

14. The Project Sponsors shall maintain all records required under this Order that includes the MRP for at least 5 years.

15. After notice and opportunity for a hearing, this Order may be modified, revoked, reissued, or terminated for cause, which include, but is not limited to:

    A. Failure to comply with any condition of this Order;

    B. Endangerment of human health or the environment resulting from the permitted activities in this Order;

    C. Obtaining this Order by misrepresentation, or failure to disclose all relevant facts;

    D. Acquisition of new information, which could have justified the application of different conditions if known at the time of Order adoption;

    E. A change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge.

16. The Project Sponsors shall furnish, within a reasonable time, any information the Regional Board or the DHS may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order. The Project Sponsors shall also furnish to the Regional Board or the DHS, upon request, copies of any records

required to be kept under this Order.

17. Filing of a request for modification, revocation, reissuance, or termination of the Order, or a notification of planned changes or anticipated noncompliance, does not stay any condition of this Order.

18. DHS's December 15, 2004, West Basin Water Recycling Plant, West Coast Basin Barrier Project Expansion Phase III - Findings of Fact (Attachment A-10) are incorporated herein and made part of this Order.

19. All pipelines and valves are installed with purple identification tapes or purple polyethylene vinyl wraps according to the American Water Works Association (AWWA) California-Nevada Section guidelines.

20. The District shall furnish a copy of all approved documents by the DHS such as SCIP to the Regional Board.

IX. REOPENER

This Order may be reopened to include the most scientifically relevant, and appropriate limitations for this groundwater direct injection project.

X. RESCISSION

Order No. 97-069, adopted by this Regional Board on May 12, 1997, is hereby rescinded, except for enforcement purposes.

XI. EFFECTIVE DATE OF THE ORDER

This Order takes effect upon its adoption.

I, Jonathan S. Bishop, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order Adopted by the California Regional Water Quality Control Board, Los Angeles Region on January 19, 2006.

Jonathan S. Bishop
Executive Officer

/DTSAI/

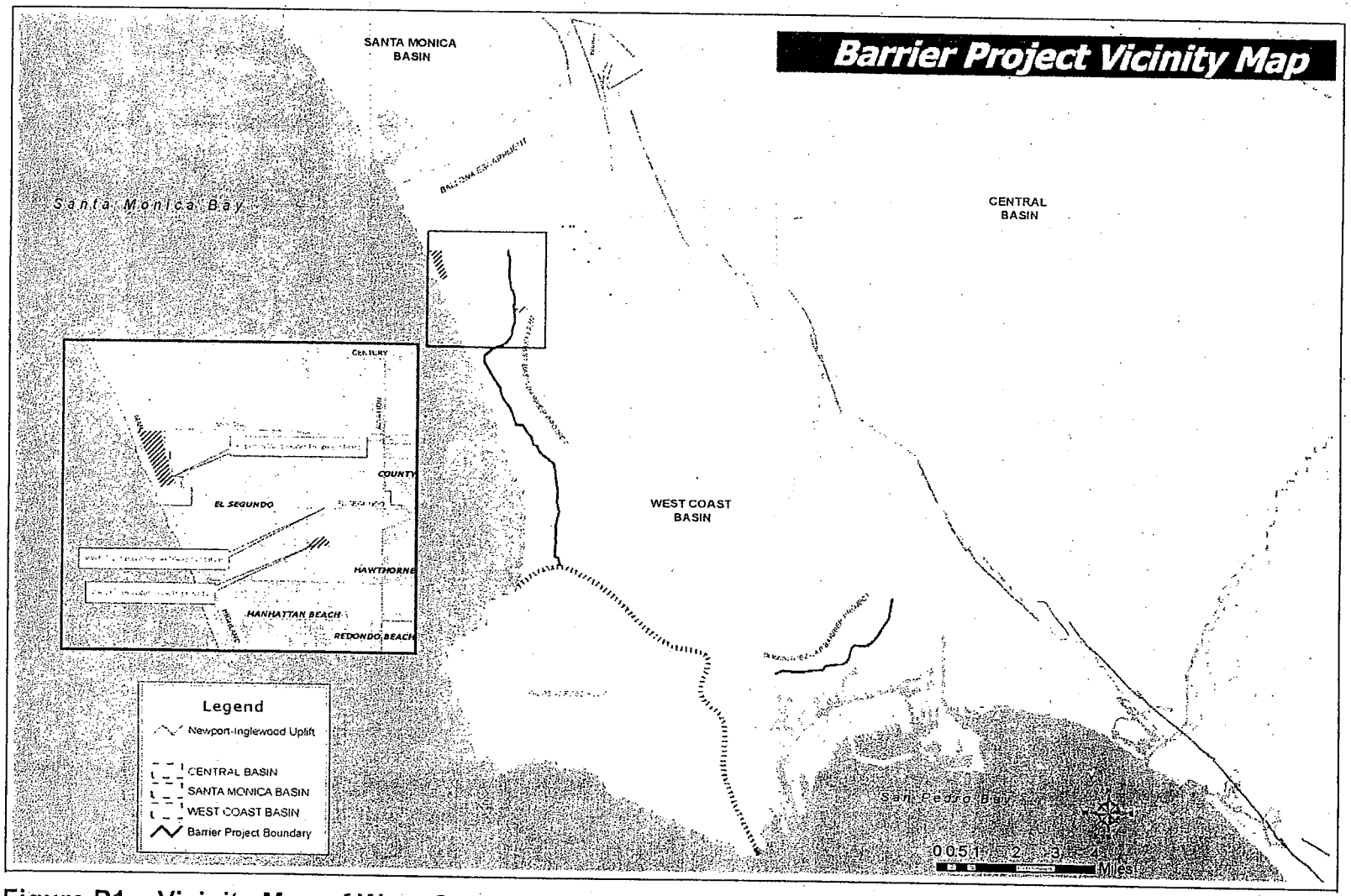

Figure P1 – Vicinity Map of West Coast Basin Barrier Project

11-111

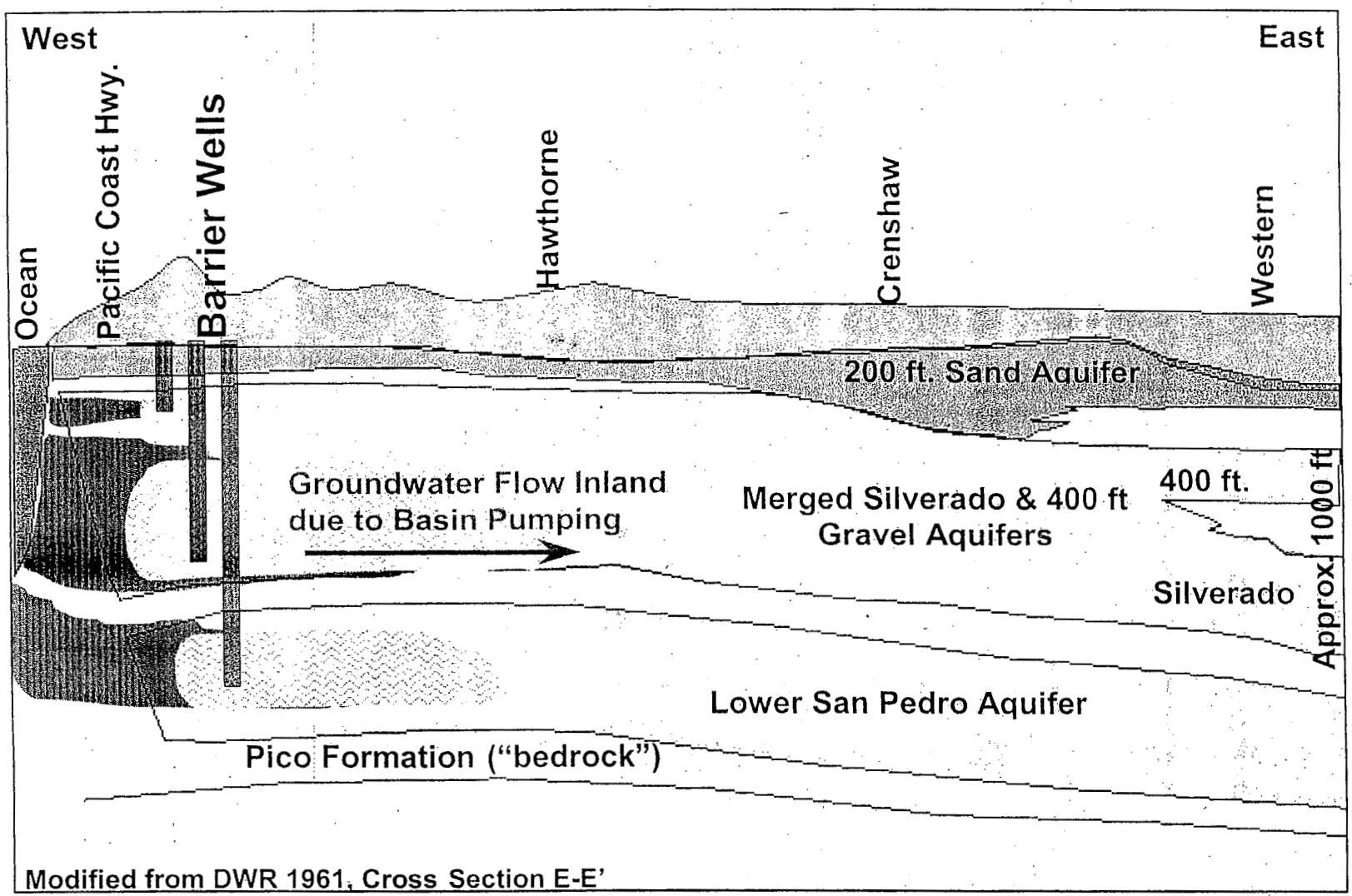

Figure P2 – Generalized Geologic Cross Section of Aquifers

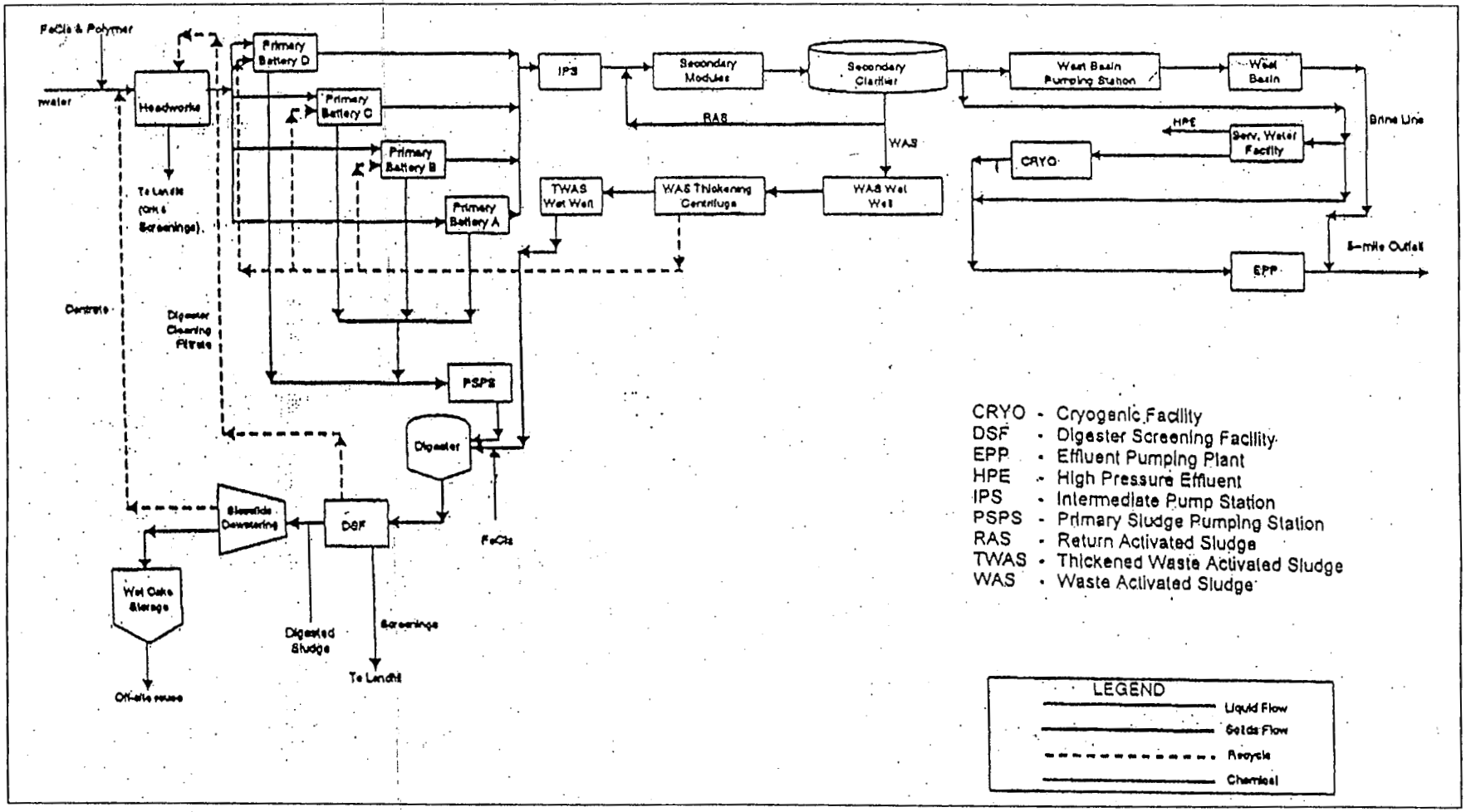

Figure P3 – Schematic of Wastewater Flow at Hyperion Treatment Plant

11-113

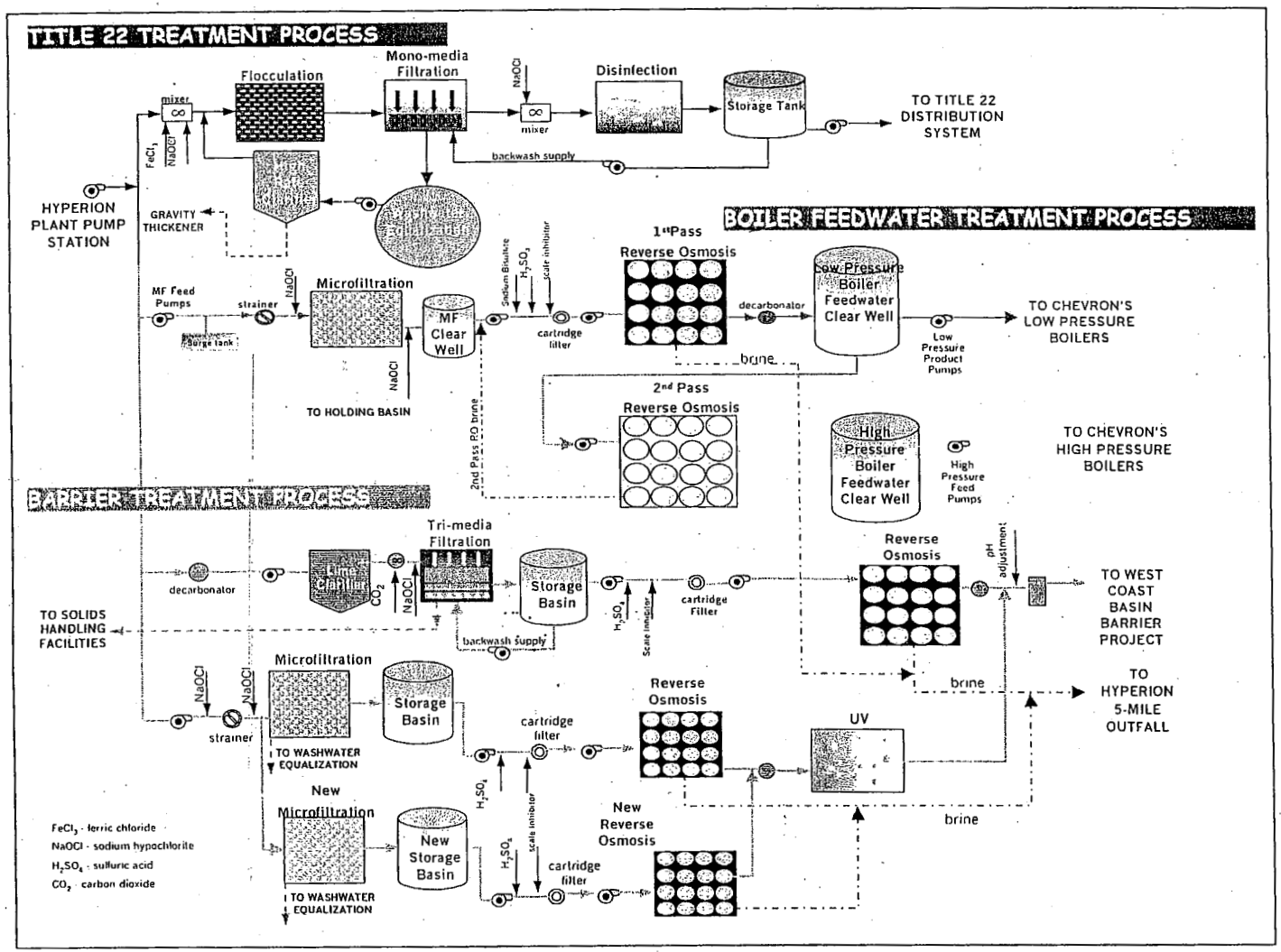

Figure P4 – Schematic of Treatment Trains at West Basin Water Recycling Plant

11-114

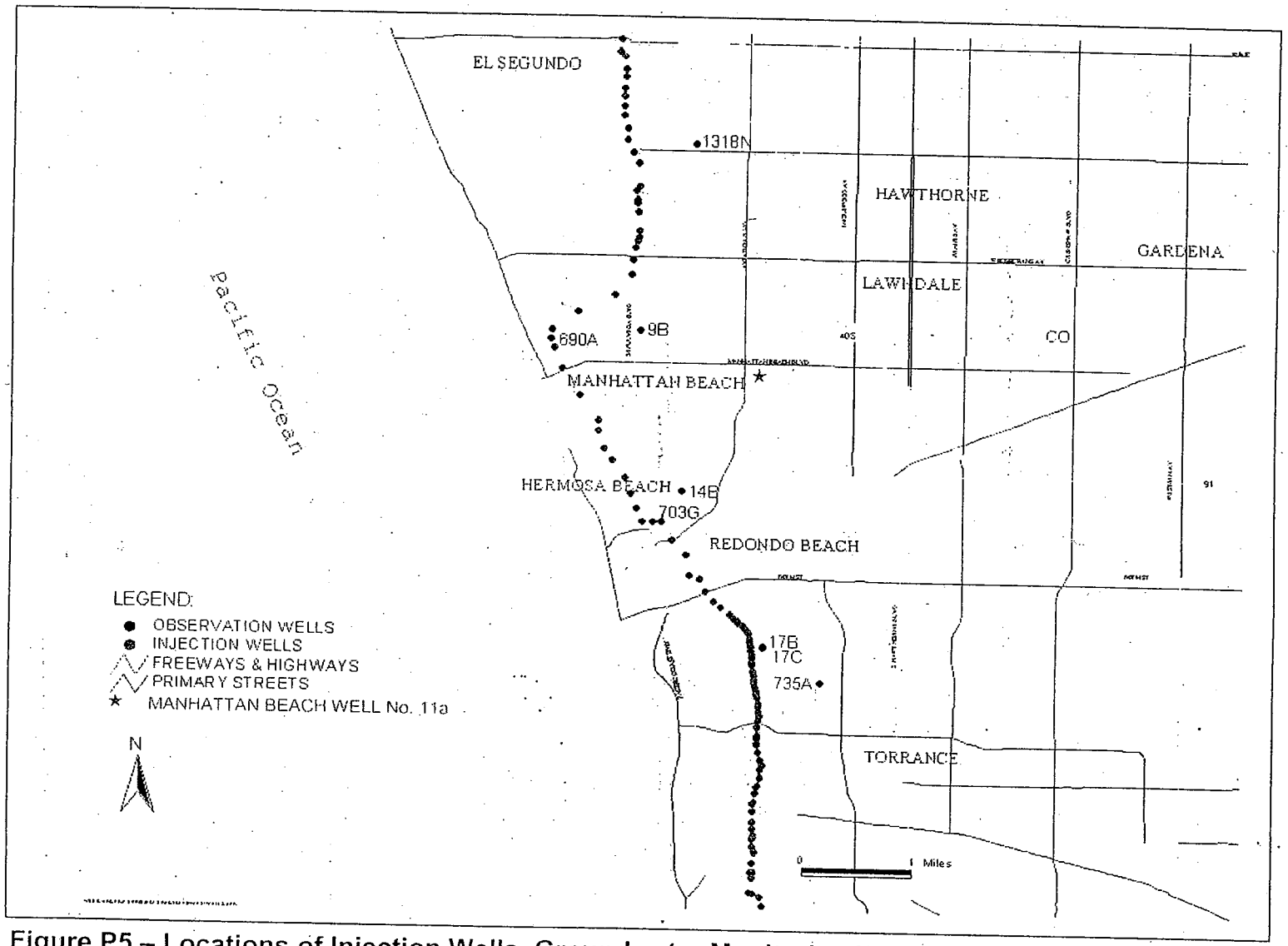

Figure P5 – Locations of Injection Wells, Groundwater Monitoring Wells, and Production Well

Attachment A-1

Table – Injection Wells			
State ID No.	LACDPW Project No.	Map Label No.	Aquifer Injected
3S/15W-12X11S	1308AB	12X1	200-ft
3S/15W-12X09S	1308AC	12X9	200-ft
3S/15W-13X13S	1308AA	13X1	200-ft
3S/15W-13R03S	1309F	13R3	Silverado
3S/15W-13R02S	1309E	13R2	Silverado
3S/14W-31X04S	713G	31X4	Silverado
4S/14W-06X13S	724V	6X13	Lower San Pedro
4S/14W-05X13S	725BC	5X13	Silverado
4S/14W-08X27S	725BJ	8X27	Silverado
4S/14W-08X15S	726AS	8X15	Silverado
4S/14W-17X10S	726AX	17X10	Silverado
4S/14W-17X12S	727AC	17X12	Silverado
4S/14W-17X13S	727AS	17X13	Lower San Pedro
4S/14W-08X14S	725BK	8X14	Lower San Pedro
4S/14W-08X08S	726AT	8X8	Lower San Pedro
4S/14W-17X02S	727AD	17X2	Lower San Pedro
4S/14W-08X13S	725AC	8X13	Lower San Pedro
4S/14W-08H01S	725AG	8H1	Lower San Pedro
4S/14W-08X01S	726AQ	8X1	Lower San Pedro
4S/14W-08X02S	726AL	8X2	Silverado
4S/14W-08X31S	726BC	8X31	Lower San Pedro
4S/14W-17X08S	727AG	17X8	Lower San Pedro
4S/14W-20X05S	728N	20X5	Lower San Pedro
4S/14W-20X08S	728J	20X8	Silverado
4S/14W-17D00S	726AW	17D0	Lower San Pedro
4S/14W-17X06S	727AN	17X6	Lower San Pedro
4S/14W-17X15S	727AR	17X15	Lower San Pedro
4S/14W-17X19S	727AJ	17X19	Silverado
4S/14W-05X03S	725BE	5X3	Silverado
4S/14W-05X07S	724M	5X7	Silverado
3S/15W-12X14S	1306J	12X14	Silverado
3S/15W-12X15S	1307Y	12X15	Silverado
3S/15W-12X02S	1307R	12X2	200-ft
3S/15W-12X03S	1307AA	12X3	Silverado
3S/15W-12X12S	1307T	12X12	200-ft
3S/15W-12X21S	1307AC	12X21	Silverado
3S/15W-12X18S	1307V	12X18	200-ft
3S/15W-12X06S	1307AE	12X6	Silverado
3S/15W-12X07S	1307AF	12X7	Silverado
3S/15W-12X13S	1308AF	12X13	Silverado

Table – Injection Wells			
State ID No.	LACDPW Project No.	Map Label No.	Aquifer Injected
3S/15W-12X08S	1308AG	12X8	Silverado
3S/15W-13X12S	1308Z	13X12	200-ft
3S/15W-13X10S	1308AJ	13X10	Silverado
3S/15W-13X02S	1308AE	13X2	Silverado
3S/15W-13X08S	1309AJ	13X8	Silverado
3S/15W-13X05S	1309AE	13X5	200-ft
3S/15W-13X04S	1309AI	13X4	Silverado
3S/15W-24X07S	1309AD	24X7	200-ft
3S/15W-24X06S	700F	24X6	Silverado
3S/15W-24X09S	690H	24X9	200-ft
3S/15W-24X05S	690J	24X5	200-ft
4S/14W-08X17S	725AB	8X17	Silverado
4S/14W-08X20S	725AF	8X20	Silverado
4S/14W-08X25S	725V	8X25	Silverado
4S/14W-08X22S	725Z	8X22	Silverado
4S/14W-08X16S	725W	8X16	Silverado
4S/14W-08X26S	725BL	8X26	Silverado
4S/14W-08X12S	725AE	8X12	Lower San Pedro
4S/14W-08D00S	725U	8D0	Silverado
4S/14W-08X24S	725Y	8X24	Silverado
4S/14W-08X33S	725AA	8X33	Silverado
4S/14W-08X28S	725BM	8X28	Lower San Pedro
4S/14W-08X30S	726AB	8X30	Silverado
4S/14W-08X18S	725X	8X18	Silverado
4S/14W-08X23S	726AN	8X23	Silverado
4S/14W-08X07S	726AY	8X7	Lower San Pedro
4S/14W-08X32S	726AA	8X32	Silverado
4S/14W-08X10S	726AM	8X10	Lower San Pedro
4S/14W-08X09S	726BE	8X9	Silverado
4S/14W-08X05S	726AZ	8X5	Lower San Pedro
4S/14W-08X21S	726AR	8X21	Silverado
4S/14W-08X06S	726BB	8X6	Lower San Pedro
4S/14W-17X11S	726BA	17X11	Lower San Pedro
4S/14W-17X14S	727AE	17X14	Silverado
4S/14W-17X09S	727AF	17X9	Silverado
4S/14W-17X16S	727AW	17X16	Lower San Pedro
4S/14W-17X17S	727AV	17X17	Lower San Pedro
4S/14W-20X01S	728X	20X1	Silverado
4S/14W-20X08S	728W	20X8	Lower San Pedro
4S/14W-20X03S	728M	20X3	Silverado
4S/14W-20X02S	728P	20X2	Silverado
4S/14W-20X07S	728AZ	20X7	Lower San Pedro

Table – Injection Wells			
State ID No.	LACDPW Project No.	Map Label No.	Aquifer Injected
4S/14W-20X06S	728K	20X6	Lower San Pedro
4S/14W-20X04S	728L	20X4	Silverado
4S/14W-08X04S	726AU	8X4	Silverado
4S/14W-17X05S	726AV	17X5	Silverado
3S/15W-36X01S	702Q	36X1	Silverado
3S/15W-36X03S	703H	36X3	200-ft/ Silverado
3S/14W-31X02S	703J	31X2	200-ft/ Silverado
4S/14W-17X03S	727AX	17X3	Lower San Pedro
4S/14W-17X01S	727AL	17X1	Silverado
3S/14W-31X03S	714S	31X3	Silverado
4S/14W-17X24S	727AM	17X24	Silverado
4S/14W-17X21S	727AU	17X21	Lower San Pedro
4S/14W-17X18S	727AH	17X18	Silverado
4S/14W-17X04S	727AP	17X4	Silverado
4S/14W-17X22S	727AQ	17X22	Silverado
3S/14W-31X01S	703K	31X1	Silverado
4S/14W-17X07S	727AK	17X7	Lower San Pedro
3S/14W-31X05S	713F	31X5	Silverado
4S/14W-17X20S	727AT	17X20	Lower San Pedro
4S/14W-06X02S	714T	6X2	Silverado
4S/14W-17X25S	728V	17X25	Lower San Pedro
4S/14W-17X23S	728H	17X23	Silverado
4S/14W-06X14S	714U	6X14	Silverado
4S/14W-06X03S	714AD	6X3	Lower San Pedro
4S/14W-06X07S	714M	6X7	Silverado
4S/14W-06X06S	714AB	6X6	Lower San Pedro
4S/14W-06X08S	714N	6X8	Silverado
4S/14W-06X09S	714P	6X9	Silverado
4S/14W-06X01S	714K	6X1	Silverado
4S/14W-06X04S	714AC	6X4	Lower San Pedro
4S/14W-06X05S	714L	6X5	Silverado
4S/14W-06X10S	724J	6X10	Silverado
4S/14W-05X05S	724W	5X5	Lower San Pedro
4S/14W-05X04S	724Q	5X4	Silverado
4S/14W-05X02S	725BN	5X2	Lower San Pedro
4S/14W-05X10S	725BD	5X10	Silverado
4S/14W-05X11S	725BF	5X11	Lower San Pedro
4S/14W-05X08S	725BG	5X8	Silverado
4S/14W-06X11S	724K	6X11	Silverado
4S/14W-06X12S	724L	6X12	Silverado
4S/14W-05X12S	724N	5X12	Lower San Pedro
4S/14W-05X06S	724P	5X6	Silverado

Table – Injection Wells			
State ID No.	**LACDPW Project No.**	**Map Label No.**	**Aquifer Injected**
4S/14W-08X29S	725BH	8X29	Silverado
3S/15W-12X01S	1306H	12X1	200-ft
3S/15W-12X10S	1307Q	12X10	200-ft
3S/15W-12X22S	1307Z	12X22	Silverado
3S/15W-12X16S	1307S	12X16	200-ft
3S/15W-12X04S	1307AB	12X4	Silverado
3S/15W-12X17S	1307U	12X17	200-ft
3S/15W-12X05S	1307AD	12X5	Silverado
3S/15W-12X19S	1307W	12X19	200-ft
3S/15W-12X20S	1307X	12X20	200-ft
3S/15W-13X11S	1308AH	13X11	Silverado
3S/15W-13X09S	1308AD	13X9	200-ft
3S/15W-13X07S	1309AG	13X7	200-ft/ Silverado
3S/15W-13X06S	1309AF	13X6	200-ft
3S/15W-13X03S	1309AK	13X3	Silverado
3S/15W-13X01S	1309AH	13X1	200-ft
3S/15W-24X03S	1309AL	24X3	Silverado
3S/15W-24X08S	700E	24X8	200-ft
3S/15W-24X04S	690K	24X4	Silverado
3S/15W-24X02S	690L	24X2	Silverado
3S/15W-24X10S.	690D	24X10	200-ft/ Silverado
3S/15W-24X01S	691EE	24X1	200-ft/ Silverado
3S/15W-25X01S	691DD	25X1	200-ft/ Silverado
3S/15W-25X02S	691T	25X2	200-ft/ Silverado
3S/15W-25X03S	692S	25X3	Silverado
3S/15W-25X04S	692L	25X4	Silverado
3S/15W-25X05S	692G	25X5	200-ft/ Silverado
3S/15W-25X06S	702J	25X6	200-ft/ Silverado
3S/15W-36X02S	702P	36X2	200-ft/ Silverado

Attachment A-2

Table 64431-A – Inorganic Chemicals*	
Chemical	**Maximum Contamination Levels (mg/L)**
Aluminum	1
Antimony	0.006
Arsenic	0.010
Asbestos	7 MFL**
Barium	1
Beryllium	0.004
Cadmium	0.005
Chromium	0.05
Cyanide	0.15
Mercury	0.002
Nickel	0.1
Nitrite (as nitrogen)	1
Selenium	0.05
Thallium	0.002
Fluoride	2

California Code of Regulation (CCR) Title 22, Section 64431
**MFL = million fibers per liter; MCL for fibers exceeding 10μm in length.

Attachment A-3

Table 4 – Radioactivity*	
Chemical	**Maximum Contamination Levels (pCi/L)**
Combined Radium-226 and Radium-228	5
Gross Alpha Particle Activity (Including Radium-226 but Excluding Radon and Uranium)	15
Tritium	20,000
Strontium-90	8
Gross Beta Particle Activity (Beta emitters	50
Uranium	20

California Code of Regulation (CCR) Title 22, Section 64443
*Last update: September 12, 2003.

Attachment A-4

Table 64444-A – Organic Chemicals*	
Chemical	**Maximum Contamination Levels (mg/L)**
(a) Volatile Organic Chemicals	
Benzene	0.001
Carbon Tetrachloride (CTC)	0.0005
1,2-Dichlorobenzene	0.6
1,4-Dichlorobenzene	0.005
1,1-Dichloroethane	0.005
1,2-Dichloroethane (1,2-DCA)	0.0005
1,1-Dichloroethene (1,1-DCE)	0.006
Cis-1,2-Dichloroethylene	0.006
Trans-1,2-Dichloroethylene	0.01
Dichloromethane	0.005
1,2-Dichloropropane	0.005
1,3-Dichloropropene	0.0005
Ethylbenzene	0.3
Methyl-tert-butyl-ether (MTBE)	0.013
Monochlorobenzene	0.07
Styrene	0.1
1,1,2,2-Tetrachloroethane	0.001
Tetrachloroethylene (PCE)	0.005
Toluene	0.15
1,2,4-Trichlorobenzene	0.005
1,1,1-Trichloroethane	0.2
1,1,2-Trichloroethane	0.005
Trichloroethylene (TCE)	0.005
Trichlorofluoromethane	0.15
1,1,2-Trichloro-1,2,2-Trifluoroethane	1.2
Vinyl Chloride	0.0005
Xylenes (m,p)	1.75**
(b) Non-Volatile synthetic Organic Chemicals	
Alachlor	0.002
Atrazine	0.001
Bentazon	0.018
Benzo(a)pyrene	0.0002
Carbofuran	0.018
Chlordane	0.0001
2,4-D	0.07
Dalapon	0.2
1,2-Dibromo-3-chloropropane (DBCP)	0.0002

Table 64444-A – Organic Chemicals*	
Chemical	**Maximum Contamination Levels (mg/L)**
(b) Non-Volatile synthetic Organic Chemicals	
Di(2-ethylhexyl)adipate	0.4
Di(2-ethylhexyl)phthalate	0.004
Dinoseb	0.007
Diquat	0.02
Endothall	0.1
Endrin	0.002
Ethylene Dibromide (EDB)	0.00005
Glyphosate	0.7
Heptachlor	0.00001
Heptachlor Epoxide	0.00001
Hexachlorobenzene	0.001
Hexachlorocyclopentadiene	0.05
Lindane	0.0002
Methoxychlor	0.03
Molinate	0.02
Oxamyl	0.05
Pentachlorophenol	0.001
Picloram	0.5
Polychlorinated Biphenyls	0.0005
Simazine	0.004
Thiobencarb	0.07
Toxaphene	0.003
2,3,7,8-TCDD (Dioxin)	3×10^{-8}
2,4,5-TP (Silvex)	0.05

California Code of Regulation (CCR) Title 22, Section 64444
*Last update: September 12, 2003.
**MCL is for either a single isomer or the sum of the isomers.

Attachment A-5

Table 64533-A – Primary MCLs for Disinfection Byproducts*	
Constituent	**Maximum Contamination Levels (mg/L)**
Total Trihalomethanes (TTHM)	0.080
Bromodichloromethane	
Bromoform	
Chloroform	
Dibromochloromethane	
Haloacetic acid (five) (HAA5)	0.060
Monochloroacetic acid	
Dichloroacetic acid	
Trichloroacetic acid	
Monobromoacetic acid	
Dibromoacetic acid	
Bromate	0.010
Chlorite	1.0

California Code of Regulation (CCR) Title 22, Section 64533, Chapter 15.5
*Last update: January 28, 2004.

Attachment A-6

Monitoring Parameters for General Physical and General Mineral*

Calcium	Potassium	Corrosivity
Chloride	Sodium	Foaming Agents
Copper	Sulfate	Odor
Iron	Zinc	Total Dissolved Solids
Manganese	Color	Total Hardness

California Code of Regulation (CCR) Title 22, Section 64449
*Last update: September 12, 2003

Attachment A-7

Table 64449-A – Secondary Maximum Contamination Levels Consumer Acceptance Limits*	
Chemical	**Units**
Aluminum	0.2 mg/L
Copper	1.0 mg/L
Corrosivity	Non-corrosive
Foam Agents (MBAS)	0.5 mg/L
Iron	0.3 mg/L
Manganese	0.05 mg/L
Methyl-tert-butyl-ether (MTBE)	0.005 mg/L
Odor – Threshold	3 units
Silver	0.1 mg/L
Thiobencarb	0.001 mg/L
Zinc	5.0 mg/L

California Code of Regulation (CCR) Title 22, Section 64449
*Last update: September 12, 2003.

Attachment A-8

Chemicals of Concern to the Regional Board		
Note	**Chemical**	**Units (mg/L)**
1	n-Butylbenzene	0.26
2	sec-Butylbenzene	0.26
3	tert-Butylbenzene	0.26
4	Carbon disulfide	0.16
5	Chlorate	0.8
6	2-Chlorotoluene	0.14
7	4-Chlorotoluene	0.14
8	Diazinon	6
9	Dichlorodifluoromethane (Freon 12)	1
10	1,4-Dioxane	0.003
11	Ethylene glycol	14
12	Formaldehyde	0.1
13	Isopropylbenzene	0.77
14	Manganese	0.5
15	Methyl isobutyl ketone (MIBK)	0.12
16	Naphthalene	0.017
17	n-Nitrosodiethyamine (NDEA)	0.00001
18	n-Nitrosodimethylamine (NDMA)	0.00001
19	Perchlorate	0.006
20	n-Propylbenzene	0.26
21	Tertiary butyl alcohol (TBA)	0.012
22	1,2,3-Trichloropropane (1,2,3-TCP)	0.000005
23	1,2,4-Trimethylbenzene	0.33
24	1,3,5-Trimethylbenzene	0.33
25	Vanadium	0.05

Notes for Chemicals of Concern to the Regional Board

1. **n-Butylbenzene:**
   ENDPOINT: Noncancer – increased kidney weight in rats, using cumene (isopropylbenzene) as a surrogate.
   REFERENCES: National Center for Environmental Assessment (NCEA), 1997, Risk Assessment Issue Paper for: Derivation of Provisional Chronic RfDs for n-Butylbenzene, sec-Butylbenzene, tert-Butylbenzene, and n-Propylbenzene. NCEA, US EPA (97-009/6-5-97).
2. **sec-Butylbenzene:**
   ENDPOINT: Noncancer – increased kidney weight in rats, using cumene (isopropylbenzene) as a surrogate.
   REFERENCE: Office of Environmental Health Hazard Assessment (OEHHA), 2000.

3. **tert-Butylbenzene:**
   ENDPOINT: Noncancer – increased kidney weight in rats, using cumene (isopropylbenzene) as a surrogate.
   REFERENCE: OEHHA, 2000.
4. **Carbon disulfide:**
   ENDPOINT: Noncancer – decreased motor conduction velocity in people.
   REFERENCE: OEHHA, 2001.
5. **Chlorate:**
   ENDPOINT: Noncancer – pituitary gland vacuolization & thyroid gland depletion in rats.
   REFERENCE: OEHHA, 2002.
6. **2-Chlorotoluene:**
   ENDPOINT: Noncancer – decrease in body weight gain in rats.
   REFERENCE: IRIS, 1990.
7. **4-Chlorotoluene:**
   ENDPOINT: Noncancer – decrease in body weight gain in rats.
   REFERENCE: IRIS, 1990.
8. **Diazinon:**
   ENDPOINT: Noncancer – neurotoxicity.
   REFERENCE: Health Effects Advisory Summary Tables (HEAST), FY 1997 Update, US EPA, Solid Waste and Emergency Response, 9200.6-303 (97-1), EPA-540-R-97-036, July 1997.
9. **Dichlorodifluoromethane:**
   ENDPOINT: Noncancer – reduced body weight in rats.
   REFERENCE: IRIS, 1995.
10. **1,4-Dioxane:**
    ENDPOINT: Cancer in rats, mice, and guinea pigs.
    REFERENCE: IRIS, 1990.
11. **Ethylene glycol:**
    ENDPOINT: Noncancer – kidney toxicity in rats.
    REFERENCE: IRIS, 1989.
12. **Formaldehyde:**
    ENDPOINT: Noncancer by ingestion – reduced wight gain, histopathology in rats.
    REFERENCE: IRIS, 1990.
13. **Isopropylbenzene:**
    ENDPOINT: Noncancer – increased kidney weight in rats.
    REFERENCE: IRIS, 1997.
14. **Manganese:**
    ENDPOINT: Noncancer – neurotoxicity, based on human data.
    REFERENCE: IRIS, 1996.
15. **Methyl isobutyl ketone:**
    ENDPOINT: Noncancer – increased kidney and liver weight, kidney pathology in rats.
    REFERENCE: OEHHA, 1999.
16. **Naphthalene:**
    ENDPOINT: Noncancer – decreased body weight in rats.
    REFERENCE: IRIS, 1998.

17. **n-Nitrosodiethyamine:**
    ENDPOINT: Cancer in a variety of laboratory animals.
    REFERENCE: the 10^{-6} cancer risk level is 0.000001 mg/L, derived from the 10^{-5} lifetime cancer risk level in 22 CCR § 12705.
18. **n-Nitrosodimethylamine:**
    ENDPOINT: Cancer in a variety of laboratory animals.
    REFERENCE: the 10^{-6} cancer risk level is 0.000002 mg/L, derived from the 10^{-5} lifetime cancer risk level in 22 CCR § 12705.
19. **Perchlorate:**
    ENDPOINT: Noncancer – thyroid gland effects, based on humans.
    REFERENCE: Public health goal for perchlorate in drinking water, OEHHA, March 2004.
20. **n-Propylbenzene:**
    ENDPOINT: Noncancer – increased kidney weight in rats, using cumene (isopropylbenzene) as a surrogate.
    REFERENCE: OEHHA, 2000.
21. **Tertiary butyl alcohol:**
    ENDPOINT: Cancer – renal adenomas and carcinomas in male rats, thyroid adenomas in female mice.
    REFERENCE: OEHHA, 1999.
22. **1,2,3-Trichloropropane:**
    ENDPOINT: Cancer – begin and malignant tumors in multiple sites in rats.
    REFERENCE: HEAST, 1997. Health Effects Advisory Summary Tables (HEAST), FY 1997 Update, US Environmental Protection Agency (US EPA), Solid Waste and Emergency Response, 9200.6-303 (97-1), EPA-540-R-97-036, July 1997. OEHHA concurred with the notification level for 1,2,3-TCP via a May 28, 1999 memorandum.
23. **1,2,4-Trimethylbenzene:**
    ENDPOINT: Noncancer – increased serum phosphorus levels in rats.
    REFERENCE: OEHHA, 2001.
24. **1,3,5-Trimethylbenzene:**
    ENDPOINT: Noncancer – increased serum phosphorus levels in rats.
    REFERENCE: OEHHA, 2001.
25. **Vanadium:**
    ENDPOINT: Noncancer – developmental and reproductive effects in rats.
    REFERENCE: OEHHA, 2000.

Attachment A-9

Remaining Priority Pollutants

Pesticides	**Base/Neutral Extractibles**	Di-n-octyl phthalate
Aldrin	Acenaphthene	Diethyl phthalate
Dieldrin	Benzidine	Dimethyl phthalate
4,4'-DDT	Hexachloroethane	Benzo(a)anthracene
4,4'-DDE	Bis(2-chloroethyl)ether	Benzo(a)fluoranthene
4,4'-DDD	2-chloronaphthalene	Benzo(k)fluoranthene
Alpha-endosulfan	1,3-dichlorobenzene	Chrysene
Beta-endosulfan	3,3'-dichlorobenzidine	Acenaphthylene
Endosulfan sulfate	2,4-dinitrotoluene	Anthracene
Endrin aldehyde	2,6-dinitrotoluene	1,12-benzoperylene
Alpha-BHC	1,2-diphenylhydrazine	Fluorene
Beta-BHC	Fluoranthene	Phenanthrene
Delta-BHC	4-chlorophenyl phenyl ether	1,2,5,6-dibenzanthracene
Acid Extractibles	4-bromophenyl phenyl ether	Indeno(1,2,3-cd)pyrene
2,4,6-trichlorophenol	Bis(2-chloroisopropyl)ether	Pyrene
P-chloro-m-cresol	Bis(2-chloroethoxyl)methane	**Volatile Organics**
2-chlorophenol	Hexachlorobutadiene	Acrolein
2,4-dichlorophenol	Isophorone	Acrylonitrile
2,4-dimethylphenol	Nitrobenzene	Chlorobenzene
2-nitrophenol	N-nitrosodi-n-propylamine	Chloroethane
4-nitrophenol	N-nitrosodiphenylamine	1,1-dichloroethylene
2,4-dinitrophenol	Bis(2-ethylhexyl)phthalate	Methyl chloride
4,6-dinitro-o-cresol	Butyl benzyl phthalate	Methyl bromide
Phenol	Di-n-butyl phthalate	2-chloroethyl vinyl ether

Attachment A-10

West Basin Water Recycling Plant,
West Coast Basin Barrier Project – Expansion Phase III Project

Findings of Fact

State of California—Health and Human Services Agency
Department of Health Services

California Department of Health Services
SANDRA SHEWRY
Director

ARNOLD SCHWARZENEGGER
Governor

December 15, 2004

Mr. Jonathan Bishop
Executive Officer
California Regional Water Quality Control Board
Los Angeles Region
320 4th Street, Suite 200
Los Angeles, CA 90013

Dear Mr. Bishop:

WEST BASIN WATER RECYCLING PLANT (WBWRP), WEST COAST BASIN BARRIER PROJECT EXPANSION PHASE III – FINDINGS OF FACT

The West Basin Municipal Water District (WBMWD) has submitted to this Department a Title 22 Engineering Report, an amended report, and other supplemental information and responses to Department comments pertaining to the West Coast Basin Barrier Project Expansion Phase III. In addition, we have had multiple meetings and discussions with WBMWD about this proposed groundwater recharge project. On December 10, 2002, this Department held a public hearing in El Segundo, California, to consider the West Coast Basin Barrier Project Expansion Phase III. Enclosed please find this Department's Summary of Public Hearing, Findings of Fact and Conditions for the West Coast Basin Barrier Project Expansion Phase III.

The West Coast Basin Barrier Project Expansion Phase III is a water supply and water quality improvement project that will produce highly treated recycled water for recharge by direct injection into the West Coast Barrier Project. The proposed expansion project will increase recycled water injection up to 17.5 mgd in a phased manner. The WBWRP is located at 1935 Hughes Way, El Segundo, California 90245

The WBWRP receives secondary treated wastewater from the City of Los Angeles Hyperion Wastewater Treatment Plant located at 12000 Vista Del Mar Boulevard, Playa Del Rey, California 90293. The WBWRP Expansion will consist of four major components: (1) replacement of the existing lime clarification pretreatment system with a microfiltration (MF) pretreatment system; (2) utilization of thin film composite membranes for all reverse osmosis (RO) treatment trains; (3) installation of UV light

Southern California Drinking Water Field Operations Branc
1040 E. Herndon Avenue, Suite 205, Fresno, CA 93720
(559) 447-3300; Fax (559) 447-3304
Internet Address: http://www.dhs.ca.gov/ps/ddwem/

disinfection of the total barrier recycled water flow stream; and (4) addition of hydrogen peroxide storage and feed facilities, which in conjunction with UV disinfection provide advanced oxidation. The expanded and modified facilities will be located at the same site as the existing WBWRP in El Segundo.

As detailed in the Findings of Fact and Conditions, this Department considers the above treatment processes to be the best available treatment technology for recycled water used for groundwater recharge by direct injection. This Department finds that the proposed project complies with Section 60320 of Article 5.1, entitled "Groundwater Recharge" of the California Code of Regulations, Title 22, Division 4, Chapter 3, entitled "Water Recycling Criteria". Furthermore, this Department finds that the proposed operation of the West Coast Basin Barrier Project Expansion Phase III will not degrade the quality of the water in the receiving aquifers as a source of domestic water supply provided that WBMWD meets all of the enclosed Conditions.

It is the recommendation of this Department that the California Regional Water Quality Control Board, Los Angeles Office, incorporate all of the enclosed Findings of Fact and Conditions into the water reclamation requirements to be issued to WBMWD for the West Coast Basin Barrier Project Expansion Phase III.

If you have any questions, please contact me at (559) 447-3130.

Sincerely,

Cindy A. Forbes, P.E., Chief
Southern California Branch
Drinking Water Field Operations
State of California Department of Health Services

cc: Richard Nagel, Water Quality Manager, WBMWD
Gary Yamamoto, DHS
Bob Hultquist, DHS
Jeff Stone, DHS
Kurt Souza, DHS
Joseph Crisologo, DHS
Heather Collins, DHS
Sean McCarthy, DHS
Chi Diep, DHS

SUMMARY OF PUBLIC HEARING

In the Matter of:

West Basin Municipal Water District)
West Basin Water Recycling Plant)
West Coast Basin Barrier Project Expansion, Phase III)

On December 10, 2002, the California Department of Health Services (Department) held a public hearing in El Segundo, California, to consider the proposed West Basin Water Recycling Plant (WBWRP), West Coast Basin Barrier Project Expansion Phase III, which is a water supply and seawater intrusion barrier project sponsored by the West Basin Municipal Water District (WBMWD or District).

A list of public hearing attendees is included in Attachment A.

The hearing panel included:

Hearing Officer

Cindy Forbes, P.E., Chief of the Southern California Branch, Drinking Water Field Operations, State of California Department of Health Services

Presentations on the proposed project were made by Director Edward Little and General Manager Darryl Miller from the District and by Dr. Michael McGuire from McGuire Environmental Consultants, chair of the District's Technical Advisory Panel. They presented an overview of the District, including its water sources and supply shortages. The history of the WBWRP was described, along with the need for expansion and the project's benefits. The existing WBWRP produces up to 7.5 million gallons per day (mgd), or 7,500 acre-feet per year (afy), of recycled water for injection into the West Coast Basin Barrier Project. The proposed expansion project will increase recycled water injection up to 17.5 mgd in a phased manner. They described the groundwater basin and details of the project components, which include the advanced water treatment facilities and seawater intrusion barrier. Water quality data were presented and compared with proposed criteria. The conclusions and recommendations of the Expert Advisory Panel that independently reviewed the proposed project were reviewed. In conclusion, the District believes that the proposed expansion project will protect public health, assist in drought-proofing its service area, improve water quality, and reduce demand on imported water supplies.

The presentations were followed by statements from two members of the audience. Dr. Jack Skinner voiced concerns that potential public health issues be adequately addressed by the regulatory agencies, and Ms. Frances Spivey-Weber praised the District's management of the project and its role in assuring water supplies for Mono Lake.

FINDINGS OF FACT

1. Section 13540 of the California Water Code requires that recycled water may only be injected into an aquifer that is used as a source of domestic water supply if the Department finds that the recharge will not degrade the quality of water in the receiving aquifer as a source of water supply for domestic purposes.

2. West Basin Municipal Water District (WBMWD or District) is a public agency formed in 1947 that wholesales water to local cities, mutual water companies, private companies, and investor-owned utilities in a 200-square mile area of southwest Los Angeles County, California. Groundwater from the West Coast Basin (Basin) is a source of local water for the WBMWD service area. When local groundwater resources are insufficient to meet the area's water demands, WBMWD buys imported water from the Metropolitan Water District of Southern California (MWD), which is supplied via the State Water Project and the Colorado River Aqueduct. The District provides about 150,000 acre-feet per year or 80 percent of the water used in its South Bay service area. The remaining 20 percent is local groundwater pumped by retail water agencies. To protect the Basin from seawater intrusion, the District provides water for injection into the West Coast Basin Barrier Project (WCBBP or Barrier), as well as to recharge the Basin.

3. In 1990, the District embarked on a large-scale conservation and water recycling program to improve water supply reliability and reduce the use of imported water. The cornerstone of the recycling program is the West Basin Water Recycling Plant (WBWRP), which has been in service since 1995. The WBWRP consists of three treatment trains currently designed to produce a total of up to 42.5 million gallons per day (mgd) of recycled water. One treatment train produces up to 30 mgd of recycled water for landscape and agricultural irrigation and industrial applications and is referred to as the Title 22 Plant. Another treatment train produces up to 7.5 mgd of recycled water for barrier injection along the coastal reaches of aquifers to mitigate seawater intrusion into the groundwater basin and is referred to as the Barrier Plant. The third treatment train produces up to 5 mgd of highly treated recycled water for the boiler feed system at the Chevron Refinery in El Segundo. The WBWRP is located at 1935 Hughes Way, El Segundo, California 90245. The District operates the WBWRP under California Regional Water Quality Control Board, Los Angeles Region (RWQCB) Order No. 97-069 and Monitoring and Reporting Program No. 7485 of RWQCB Order No. 95-014 as amended by Order No. 97-069.

4. The WBWRP produces recycled water for direct injection into the Barrier, which consists of pipelines and 153 injection wells, primarily located parallel to the coast, south of Los Angeles International Airport and west of Interstate 405, in the Cities of El Segundo, Manhattan Beach, Hermosa Beach, and Redondo Beach, California. The Barrier is owned and operated by the Los Angeles

County Department of Public Works, Hydraulics/Water Conservation Division (County). Currently, a blend of approximately 17.5 mgd of recycled water and imported water is injected at the Barrier to prevent seawater intrusion and to artificially recharge the West Coast Groundwater Basin, which is used as a source of domestic water supply. No changes are proposed in the existing distribution system or Barrier injection facilities.

5. The District has submitted a Title 22 Engineering Report, an amended report, a Groundwater Monitoring and Tracer Plan, and other supplemental information and responses to Department comments pertaining to the WBWRP.

6. The WBWRP receives secondary treated wastewater from the City of Los Angeles Hyperion Wastewater Treatment Plant located at 12000 Vista Del Mar Boulevard, Playa Del Rey, California 90293. The Hyperion Wastewater Treatment Plant is operated by the City of Los Angeles Bureau of Sanitation under a National Pollutant Discharge Elimination System (NPDES) permit issued by the U.S. Environmental Protection Agency, NPDES Permit No. CA0109991 and RWQCB Order No. 94-021.

7. The District plans to expand the capacity of the WBWRP to increase the amount of recycled water injected into the Barrier from 7.5 to 17.5 mgd (7,500 to 17,500 acre-feet per year (afy)) in a two-phase manner. The first phase of the expansion will increase recycled water production and injection into the Barrier up to 12.5 mgd (12,500 afy). During this initial phase, approximately 5 mgd (5,000 afy) of imported potable water will be blended with this recycled water supply and injected into the Barrier. Pending the Department's approval, the District proposes to implement a second phase expansion to increase recycled water production and injection into the Barrier up to 17.5 mgd (17,500 afy). Besides expanding the facilities, the project will upgrade and modify the existing treatment systems. The existing lime pretreatment system will be replaced by a new microfiltration system, and an ultraviolet (UV) disinfection system will be added. Furthermore, hydrogen peroxide will be added upstream of the UV system for advanced oxidation of the high quality product water. The WBWRP Expansion will treat wastewater to meet drinking water standards and other limits imposed on recycled water intended for groundwater recharge and indirect potable reuse.

   The WBWRP Expansion will consist of four major components: (1) replacement of the existing lime clarification pretreatment system with a microfiltration (MF) pretreatment system; (2) utilization of thin film composite membranes for all reverse osmosis (RO) treatment trains; (3) installation of UV light disinfection of the total barrier recycled water flow stream; and (4) addition of hydrogen peroxide storage and feed facilities, which in conjunction with UV disinfection provide advanced oxidation. The expanded and modified facilities will be located at the same site as the existing WBWRP in El Segundo.

The treatment technology used for the proposed WBWRP Expansion will consist of:

- Source Control: The City of Los Angeles Bureau of Sanitation (City) maintains a comprehensive industrial pretreatment and source control program approved by the U.S. Environmental Protection Agency for control of waste discharges from industrial sources into the wastewater collection system. The City is responsible for collecting all water quality samples of the treated effluent to fulfill the requirements of its NPDES permits issued by the Los Angeles Regional Water Quality Control Board. On May 19, 2004, the City agreed to investigate the industrial sources of perchlorate, NDMA and 1,4-dioxane. The City also agreed to work cooperatively with the West Basin to develop an Implementation Plan for increased source control investigation.
- Secondary Treatment: Wastewater will be treated at the City of Los Angeles' Hyperion Wastewater Treatment Plant, which features preliminary, advanced primary, and secondary treatment processes. The existing rated capacity of the Hyperion Treatment Plant is nearly 600 mgd. Preliminary treatment consists of barscreens and grit removal. Primary treatment consists of coagulant addition and sedimentation. Primary effluent is oxidized using a pure oxygen activated sludge process. Secondary clarifiers at the activated sludge system produce fully oxidized and clarified secondary effluent. Secondary effluent will be the source water supplied to the WBWRP Expansion.

The following treatment processes will be provided at the WBWRP:

- Pretreatment Strainers: Secondary treated wastewater pumped from the Hyperion Treatment Plant will pass through automatic in-line strainers and be chloraminated prior to microfiltration. Fine solids that are captured will be returned to the existing dewatering holding basin at WBWRP.
- Microfiltration: Pretreated chloraminated secondary effluent will flow to the microfiltration (MF) system containing hollow fiber membranes. Depending on the specific type of equipment selected for installation, the MF system will feature either: (a) pressurized MF units with polyvinylidine fluoride membranes with a maximum pore size of 0.1 micron; or (b) in-basin MF units with polypropylene membranes with a maximum pore size of 0.2 micron, or with proprietary material membranes with a maximum pore size of 0.02 micron. These MF systems have been accepted by the Department as approved alternatives to media filtration. Two new 5.9 mgd MF systems, one to replace the existing lime pretreatment system and one to expand the plant capacity, will be installed. The new 11.8 mgd of MF filtrate capacity will bring the total installed barrier water MF filtrate capacity up to a total of 14.6 mgd. Later, the ultimate expanded MF filtrate capacity

will be 17.6 mgd, for a total MF system capacity of 20.4 mgd. MF filtrate will be discharged to the existing intermediate storage basin. The MF units will be periodically backwashed to clean the membranes. Waste backwash will be discharged to the existing barrier water backwash waste equalization basin and then pumped to the solids handling system.

- Reverse osmosis: Stored MF filtrate will be pumped from the existing intermediate storage basin to the reverse osmosis (RO) system. Upstream of the RO process, the flow will be pretreated by adding sulfuric acid for pH control by adding a threshold inhibitor to prevent precipitation of sparingly soluble salts, and by 20-micron cartridge filtration. One new RO train with a product capacity of 3.5 mgd will be added, and the existing RO system will be modified to expand its capacity from 7.5 mgd to 9.0 mgd, thereby increasing the total barrier production up to 12.5 mgd. The new RO train will consist of a high pressure feed pump and 108 pressure vessels in two banks, arranged in a 72:36 array. The RO is a single-stage, dual pass process. Each pressure vessel will contain seven high rejection thin film composite polyamide membrane elements. The RO system is designed for an 85 percent recovery rate. Ultimately, another 5 mgd RO train will be added to increase the Barrier Plant capacity up to 17.5 mgd. Permeate from the RO system will be discharged to the advanced oxidation and UV light treatment/disinfection processes. Concentrated brine from the RO system will be discharged via an existing pipeline directly to the Hyperion Treatment Plant's ocean outfall for disposal.

- Advanced oxidation / disinfection: The advanced oxidation process (AOP) will consist of two steps: hydrogen peroxide will be added to the RO permeate upstream of UV light treatment. UV irradiation can be used for disinfection and reduction of light-sensitive contaminants. Hydrogen peroxide exposed to UV irradiation produces hydroxyl radicals that result in advanced oxidation. The UV system will conform to the requirements delineated in the "Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse" (December 2000) published by the National Water Research Institute (NWRI). The AOP system is designed and constructed to disinfect RO permeate and reduce N-Nitrosodimethylamine (NDMA) levels to a concentration below 5 parts per trillion (ppt). The hydrogen peroxide dosage will be optimized during development of the operations, maintenance and monitoring plan. The closed, in-vessel type UV system will feature low pressure, low-pressure high-output, or medium pressure UV lamps with the reactors arranged in at least two trains. The total nominal capacity of the UV system will be 12.5 mgd

- Decarbonation: Following AOP/UV disinfection, part of the water will pass through decarbonators to release excess carbon dioxide. The decarbonation system will consist of one new 5 mgd decarbonator,

three relocated existing post-decarbonators and one relocated existing pre-decarbonator. The entire decarbonation system will be located atop the existing chlorine contact basin, which will be converted into a product water storage tank to serve as a clearwell for the Barrier Water Pump Station.

- Lime stabilization: Lime will be added to the final product water to adjust the pH and reduce the potential for minerals to be leached from the cement lining used in the transmission pipelines.
- Barrier Water Pump Station: Two new pumps, one duty and one standby unit, will be added at the existing Barrier Water Pump Station.
- Solids Handling Process: Upgrades will be made to increase the capacity of the existing solids handling systems, which consist of the dewatering holding basin and washwater equalization basin serving the barrier water treatment processes. Solids will be removed using high-rate clarifiers, thickened using gravity thickeners, and dewatered using plate-and-frame presses. The recovered liquid stream will be returned to the Title 22 Plant for treatment. Dewatered cake solids will be hauled to a landfall for disposal.

The proposed project complies with Section 60320 of Article 5.1, entitled "Groundwater Recharge", of the California Code of Regulations Title 22, Division 4, Chapter 3, entitled "Water Recycling Criteria". The Department considers the above treatment to be the best available treatment technology for recycled water used for groundwater recharge by direct injection.

8. During construction of WBWRP Expansion, the existing WRWRP will remain in operation to supply recycled water to the Barrier.

9. An effective source control program is currently administered by the City of Los Angeles Bureau of Sanitation to minimize the risk that wastewater treated at the Hyperion Treatment Plant will be contaminated with toxic chemicals that impact the treatment facilities and the marine environment. The scope and purpose of this Los Angeles source control program needs to be supplemented by the approved Source Control Implementation Plan to include not only contaminants that may be detrimental to the facilities or environment, but also to include contaminants specified by the Department that may be harmful to human health and drinking water supplies. The supplement to the source control program will be administered locally solely for the purpose of addressing West Basin's water quality needs and does not require modification of the existing EPA approved and enforced program. The existing City source control program does not address all contaminants that have drinking water maximum contaminant levels (See Attachment B). WBMWD, through a comprehensive source monitoring program defined in the Source Control Implementation Plan, will be able to ensure that the recycled water produced at the WBWRP for recharge into the basin via injection at the Barrier is not contaminated with toxic chemicals of industrial origin that are of concern to the Department in drinking water sources.

West Basin agreed to develop a Source Control Implementation Plan in consultation with the City of Los Angeles, which will be approved by DHS before increased barrier operations may begin.

10. WBMWD has not developed an operating plan for the WBWRP Expansion to describe the proper operating parameters.

11. Pathogenic microorganisms may be present in the recycled water so a minimum retention time for the recycled water in the Basin before the water is extracted for drinking purposes and a minimum horizontal separation distance between the Barrier injection wells and all drinking water wells should be provided.

12. The County has operated the Barrier since the 1960's, initially injecting imported potable water to prevent seawater intrusion into the West Coast Groundwater Basin. Since completion of the WBWRP, the County has supplemented the injection supply with recycled water produced by the Barrier Plant. The amount of recycled water injected has historically averaged about 43 percent of the total recharge. The majority of injected water flows inland to replenish the Basin aquifers, which are sources of municipal water supplies. The failure to maintain an effective seawater intrusion barrier would cause serious water quality degradation in drinking water aquifers in western Los Angeles County and the potential loss of this water resource.

13. The West Coast Basin located in the southwestern Los Angeles coastal plain consists of five principal aquifers that form a complex series of interconnected sand and gravel deposits: (1) Gardena, (2) 200-ft Sand (Gage), (3) 400-ft Gravel (Lynwood), (4) Silverado, and (5) Lower San Pedro. The majority of the production is from the Silverado Aquifer, which underlies most of the Basin. The Basin is bounded on the north by the Ballona Escarpment, on the east by the Newport-Inglewood Uplift, and on the south and west by the Pacific Ocean. The Basin is impacted by many variables including factors that are some distance from the proposed project. Some of these include drought, pumping patterns and volumes, new and existing extraction projects, and amounts of recharge.

14. The Barrier consists of 153 existing injection wells. The barrier injection wells recharge three of the Basin aquifers: the 200-ft. Sand (Gage), Silverado, and Lower San Pedro Aquifers. No new injection wells are included in the project.

15. The District proposes a phased approach to injection of 100 percent recycled water at the Barrier. Initially when the WBWRP produces 12.5 mgd of recycled water, a blend of up to a maximum of 75 percent recycled water and a minimum of 25 percent water of non-wastewater origin will be injected at the Barrier. The diluent will be approximately 5 mgd of imported potable water purchased from MWD. After the WBWRP demonstrates compliance with Department criteria for recycled water quality and groundwater quality at this initial level for at least one year after the blended recharge water has reached at least one monitoring well, the proposed plan would be to increase the recycled water contribution up to

100 percent, or 17.5 mgd with completion of the ultimate WBWRP Expansion, upon Department approval. These percentages will be calculated based on the running-monthly-average recycled water contribution for the preceding period up to 60 months.

16. The closest active domestic well to the Barrier is Well No. 12-01, which is owned and operated by the California Water Service Company and is located 7,409 feet to the east of the Barrier. The rate of groundwater movement eastward from the Barrier is estimated to be 300 to 500 feet per year. This domestic water production well is more than 15 years underground travel time from the Barrier.

17. Ordinances have been adopted to effectively prevent the use of groundwater for drinking water purposes within the aquifer treatment zone that has been established as no wells closer than 2,000 feet and less than 12 months underground retention time from the Barrier. This is important in order to achieve the necessary log reduction of organism density. The ordinances also prohibit the construction of new domestic water wells in the buffer zone.

18. Eight existing monitoring wells have monitored the groundwater near the Barrier since before the first recycled water was injected in 1995. One new monitoring well is proposed for the WBWRP Expansion and Barrier Project. The new monitoring well will be constructed in Redondo Beach along the same flow path from the Barrier as existing monitoring wells 17B and 17C. The new multi-depth monitoring well will be located approximately three months underground travel time from the Barrier and will sample the same aquifers recharged by the injection wells. The following nine monitoring wells will monitor the underground movement of the recharge water and the water quality of various aquifers comprising the Basin:

Monitoring Well Number	Distance from Barrier	Aquifer(s) Monitored
1318N	2,866 feet east	200-ft Sand (Gage)
690A	450 feet west	200-ft Sand (Gage) and Silverado
703G	391 feet west	Silverado
735A	3,075 feet east	Lower San Pedro
9B	2,162 feet east	Silverado
14B	1,850 feet east	Silverado
17B	566 feet east	200-ft Sand (Gage) and Silverado
17C	566 feet east	Lower San Pedro
New	$\leq$ 100 feet east	200-ft Sand (Gage), Silverado, and Lower San Pedro

19. The estimated underground travel time to the proposed new monitoring well is approximately three months. Along this same flow path, the estimated

underground travel time to monitoring wells 17B and 17C is two to three years. These estimates are based on sampling and analysis of naturally occurring, intrinsic tracer constituents in the injected recycled water, such as chloride. A study entitled "Naturally Occurring Tracer Constituents in Water Injected for Maintenance of the West Basin Seawater Intrusion Barrier" prepared by McGuire Environmental Consultants, concluded that "naturally existing anions and their ratios should function as adequate tracers of groundwater movement for water injected into seawater intrusion barriers due to the distinct characteristics of the various source waters."

20. The District has operated an existing 2.5 mgd capacity flow train at the existing WBWRP since December 1998 that utilizes the same treatment processes, MF and RO, as those proposed for the WBWRP Expansion. In addition, the District has conducted pilot AOP (hydrogen peroxide and UV) studies. The water quality produced by the MF/RO/AOP treatment train is representative of that anticipated from the WBWRP Expansion. Water quality data from the MF/RO/AOP train indicate that the WBWRP Expansion recycled water will meet all requirements of the California Drinking Water Primary and Secondary Maximum Contaminant Levels (MCLs). Data from the MF/RO/AOP train also have indicated that selected pharmaceutically active compounds and other toxic contaminants not included in the drinking water standards are removed or reduced to low levels in the product water.

21. An independent Expert Advisory Panel has reviewed the planning and preliminary design of the WBWRP Expansion. The Chair of the Expert Advisory Panel is Dr. Michael McGuire, water treatment and water quality specialist and registered engineer, President, McGuire Environmental Consultants, Inc. Other panel members include Dr. Harvey Collins, water treatment and water quality specialist and registered engineer, Former Deputy Director of Public Health Programs and Former Chief, Division of Drinking Water and Environmental Management, California Department of Health Services; Dr. David Jenkins, water and wastewater treatment and water recycling specialist, Professor in the Graduate School, from University of California, Berkley; Dr. Perry McCarty, water and wastewater treatment and water recycling specialist, Professor Emeritus from Stanford University; and Dr. Dennis Williams, groundwater hydrologist, President, Geoscience Support Services, Inc. The expert panel prepared a report on their findings and made recommendations. The Department concurs with the expert panel's findings and recommendations.

CONDITIONS

Based on the above FINDINGS OF FACT, which are made pursuant to the information provided by West Basin Municipal Water District (WBMWD or District) in the "West Basin Water Recycling Plant, West Coast Basin Barrier Project Expansion Phase III Amended Engineering Report" dated March 2002, subsequent submittals in the form of letters and technical memoranda, and the presentations by the District and comments made by members of the public at the Public Hearing held by the California Department of Health Services, Drinking Water Field Operations Branch, on December 10, 2002, in El Segundo, California, the California Department of Health Services (Department) FINDS that the proposed operation of the West Basin Water Recycling Plant (WBWRP) and West Coast Basin Barrier Project Expansion Phase III (Barrier) will not degrade the quality of the water in the receiving aquifers as a source of domestic water supply PROVIDED THAT ALL OF THE FOLLOWING CONDITIONS ARE MET:

1. The total volume of recycled water recharged by injection shall be up to 17.5 million gallons per day (mgd) based on a monthly average (up to 17,500 acre-feet per year (afy)).

2. Treatment of recycled water intended for groundwater recharge shall consist of advanced primary sedimentation and secondary treatment, followed by microfiltration (MF), reverse osmosis (RO), advanced oxidation process (AOP), including hydrogen peroxide addition and ultraviolet (UV) light treatment and disinfection, with decarbonation and/or lime stabilization as needed for pH adjustment. Major modifications to the treatment train as described in the Engineering Report, technical memoranda and correspondence shall be subject to review by the Department and the California Regional Water Quality Control Board, Los Angeles Region (RWQCB).

3. Recycled water for injection shall, at all times, be adequately oxidized, filtered, subject to organics removal by RO and AOP using UV and hydrogen peroxide addition, and disinfected. There shall be no bypassing of any treatment process, except for decarbonation and lime treatment, which provide pH adjustment as required for stabilization in Condition 2.

4. The West Basin shall develop a Source Control Implementation Plan for proactive source control. This plan should include, but is not limited to the following elements: 1) monitoring of raw influent water from LA Bureau of Sanitation Hyperion Plant in addition to West Basin influent; 2) proactive plan for maintaining an inventory of compounds discharged into the City's wastewater collection system so that new compounds of concern can be evaluated rapidly; 3) analysis of percent reduction through each West Basin plant process for all drinking water MCL's; 4) spike or seed studies for possibly constituents of concern determined by the DHS; 5) investigation program focused on the

identified target compounds and their potential ability to persist through the treatment systems; 6) cooperative Memorandum of Agreement with the City of Los Angeles to address the source(s) of persistent constituents of concern, including evaluation of all chemicals and parameters listed in Attachment 1, and develop an comprehensive outreach program; and 7) time schedule for implementation of the preceding elements. The required Source Control Implementation Plan supplementing the source control program shall be provided to the Department by June 30, 2005 for review and approval, before expanded barrier operations may commence. A Memorandum of Agreement between West Basin and the City of L.A specifying responsibility of the Source Control Implementation Plan shall be signed and agreed upon by both parties following approval of the SCIP by DHS. All above elements must be implemented prior to increasing the monthly running average RWC to 100 percent. No expanded plant operations may begin without Department approval of the Source Control Implementation Plan and signature of the Memorandum of Agreement between West Basin and the City of Los Angeles.

5. During the initial operating period, the monthly running average recycled water contribution (RWC) that is injected into the Barrier shall not exceed 75 percent of the total water injected at the Barrier. Diluent for the Barrier shall be imported treated drinking water. Compliance shall be determined on a monthly running average basis over a time period up to a maximum of the preceding 60 months. Once a month, the average RWC shall be calculated during this period by dividing the total volume of recycled water injected during the preceding months by the total volume of injection water during that period. If the average RWC does not comply with the above requirement, the District shall notify the Department and RWQCB within 7 days and submit a report to the Department and the RWQCB within 60 days describing the reason and corrective actions taken to avoid future occurrences.

6. Following the successful completion of the initial operating period as specified below, the District may increase the monthly running average RWC to 100 percent if the following are documented in a report submitted to and approved by the Department:

    - The initial operating period shall be defined by injection of recharge water that has reached at least one Barrier monitoring well for at least one year with an average recycled water contribution (RWC) of at least 0.6 (60 percent recycled water) and the WBWRP has been in compliance with the existing DHS-specified maximum average RWC of 0.75 (75 percent recycled water);
    - Operations, monitoring, and compliance data;
    - Recycled water quality produced at the WBWRP has consistently met all requirements;

- Appropriate construction and siting of the monitoring well used in the demonstration have been validated;
- An updated engineering report;
- Review and assessment of the increased RWC by a scientific peer advisory panel; and
- Water quality data collected at the monitoring well used in the demonstration:
  - Meets all primary drinking water standards specified below in Condition No. 8;
  - Meets the total nitrogen criteria specified below in Condition No. 9; and
  - Indicates that the non-regulated contaminants, including TOC and those specified in Tables 64449-A and 64449-B, total coliform levels, and any endocrine disrupting chemicals, pharmaceuticals, or other water quality constituents specified by the Department based on the results of the receiving water monitoring are not increasing over the levels in the recycled water due to the recharge operation.

7. Any recycled water that may already be present in the groundwater because of on-going project related activities should be accounted for as a part of the total amount of recycled water in calculating the percent of recycled water in an aquifer.

8. The recycled water injected shall meet all maximum contaminant levels and other limits specified in the Drinking Water Quality and Monitoring Requirements, California Code of Regulations (CCR), Title 22, Chapter 15 as follows:

   - Inorganic chemicals in Table 64431-A (except for nitrogen compounds);
   - Radionuclides in Table 4, Section 64443;
   - Organic chemicals in Table 64444-A;
   - Any new Federal or State maximum contaminant level upon adoption;
   - Disinfection byproducts:
     - Total Trihalomethanes – 0.080 mg/L
       - Bromodichloromethane
       - Bromoform
       - Chloroform
       - Dibromochloromethane
     - Haloacetic acids – 0.060 mg/L
       - Monochloroacetic acid
       - Dichloroacetic acid

        - Trichloroacetic acid
        - Monobromoacetic acid
        - Dibromoacetic acid
    - Bromate – 0.010 mg/L
    - Chlorite - 1.0 mg/L

- Action levels for lead and copper in Section 64678; and
- Secondary maximum contaminant levels in Tables 64449-A and 64449-B ("Upper" levels).

Recycled water shall be monitored on a quarterly basis at regular intervals by analyzing a 24-hour composite or grab sample to determine compliance with primary maximum contaminant levels referenced above for inorganic chemicals, radionuclides, organic chemicals, and disinfection byproducts and with federal action levels for lead and copper referenced above. Compliance shall be based on the running-quarterly average, calculated each quarter using the previous four quarters of data. If the recycled water is out of compliance, a report shall be submitted to the Department and RWQCB that describes the reasons and the corrective actions taken.

Prior to the commencement of injection of recycled water, at least one 24-hour composite or grab sample of recycled water shall be collected and analyzed to determine compliance with primary maximum contaminant levels referenced above for inorganic chemicals, radionuclides, organic chemicals, and disinfection byproducts, and with action levels for lead and copper referenced above and to demonstrate the effectiveness of the treatment process. The results for the initial recycled water quality analysis shall be submitted to the Department and RWQCB.

Recycled water shall be monitored on an annual basis by analyzing a representative grab sample to determine compliance with secondary maximum contaminant levels listed above. If the single sample result (or average of samples collected during the year, if more than one) exceeds a secondary maximum contaminant level, a report shall be submitted to the Department and RWQCB that describes the reasons and corrective actions taken.

9. The total nitrogen concentration of the recycled water shall not exceed 5 mg/L as nitrogen. Total nitrogen shall be defined as the sum of ammonia, nitrite, nitrate, and organic nitrogen concentrations, expressed as nitrogen. Each week two grab or 24-hour composite samples of recycled water shall be collected at least three days apart for total nitrogen analysis. The District shall require the laboratory to complete the analysis within 72 hours, and if the total nitrogen concentration exceeds 5 mg/L as nitrogen, the laboratory must report the result to the District within the same 72 hours. If the average of two consecutive samples exceeds 5 mg/L as nitrogen, then the District shall investigate the causes, take appropriate actions to reduce the nitrogen levels, and within 24 hours of receiving the laboratory sample results, notify the Department and the

RWQCB. If the average of all samples collected over the ensuing two week period exceeds 5 mg/L, or more than 25% of the samples collected in any two week period exceed 10 mg/L, the District shall suspend recharge of the recycled water until appropriate corrections have been made to reduce total nitrogen levels to below 5 mg/L.

Within 30 days of conclusion of enhanced groundwater monitoring, a report summarizing the results of the enhanced groundwater monitoring program and describing the causes of the exceedance and corrective actions taken to avoid future violations of these requirements shall be submitted to the Department and RWQCB.

10. Diluent water shall be monitored quarterly for nitrate and nitrite. Within 48 hours of being informed by the laboratory of a nitrate and/or nitrite result greater than a maximum contaminant level, a confirmation sample shall be collected and analyzed. If the average of the initial and confirmation samples exceeds the maximum contaminant level:

    1. The District shall notify the Department and RWQCB within 48 hours of receiving the confirmation sample result.

    2. The causes of the exceedance shall be investigated and appropriate corrections shall be made.

    3. Each week the District shall collect and analyze two grab or 24-hour composite samples at least three days apart.

    4. If the average of all samples collected over the ensuing two-week period exceeds the applicable criterion, recharge of the diluent water shall be suspended until appropriate corrections are made.

11. The Total Organic Carbon (TOC) concentration of the recycled water shall not exceed 0.5 mg/L divided by the Department-specified maximum average RWC. Each month, compliance shall be based on the average of the most recent 20 samples. Each week a grab sample of the recycled water shall be collected for TOC analysis. Determination of compliance shall begin as soon as four samples have been collected, averaging all available samples up to 20 samples. After that time, compliance shall be determined monthly based on the most recent 20 TOC samples. The average of the most recent 20 samples shall be determined monthly. If the average TOC concentration exceeds 0.5 mg/L divided by the Department-specified maximum average RWC, then injection of recycled water shall be suspended until the above TOC requirement can be met. Within seven days of the suspension, the District shall notify the Department and RWQCB. If the average of the last four recycled water samples exceeds the TOC concentration of 0.5 mg/L divided by the Department-specified maximum

average RWC, a report shall be submitted to the Department and the RWQCB within 60 days that describes the reasons and the corrective actions that have been taken to avoid future occurrences.

12. If the average RWC does not comply with the Department-specified maximum average RWC, then the District shall notify the Department and RWQCB within 7 days and submit a report to both within 60 days describing the reason and corrective actions taken to avoid future occurrences of the non-compliance.

13. The turbidity of the RO product water prior to disinfection shall not exceed 0.2 NTU more than 5 percent of the time in any 24-hour period and shall not exceed 0.5 NTU at any time. The turbidity of the RO product water shall be continuously measured with at least one reading every 1.2 hours and recorded. Compliance with the daily average turbidity shall be determined based on using the recorded turbidity taken at intervals of no more than 1.2 hours over a 24-hour period. Should the continuous turbidity meter and recorder fail, grab sampling at a minimum frequency of 1.2 hours may be substituted for a period of up to 24 hours. The results of the daily average turbidity determinations shall be reported quarterly to the Department and the RWQCB. A failure to meet the turbidity performance requirements shall result in the suspension of injection of recycled water until such time that the cause of the failure has been identified and corrected. Any failure to meet the turbidity performance requirements shall be reported to the Department and the RWQCB in the next monthly report.

14. The recycled water intended for recharge via injection shall be disinfected such that the 7-day median number of total coliforms shall not exceed 2.2 total coliform bacteria per 100 milliliters (mL), and the number of total coliform organisms shall not exceed 23 total coliform bacteria per 100 mL in more than one sample in any 30-day period prior to injection. No sample shall exceed 240 total coliform bacteria per 100 mL. A grab sample shall be analyzed daily for total coliform bacteria. A failure to meet these requirements shall require the submission of a report describing the cause of the failure and the corrective actions taken to avoid future violations of these requirements. Failure to meet the 7-day median coliform requirement for two consecutive days shall result in the suspension of the injection of recycled water until such time the cause of the failure has been identified and corrected. Any failure to meet the total coliform requirements shall be reported to the Department and RWQCB in the next monthly report.

    UV irradiation following membrane filtration has been recognized by the Department as an acceptable alternative disinfection method to chlorination to achieve at least 5-log inactivation of virus. UV disinfection shall comply with the "Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse" (December 2000) published by the National Water Research Institute (NWRI) which specify for RO permeate that: (1) the design UV dose shall be at least 50 millijoules per square centimeter (mJ/cm^2) under maximum day flow; (2) the effluent turbidity shall be equal to or less than 0.2 NTU 95 percent of the time,

and not to exceed 0.5 NTU at any time; and (3) the RO permeate UV transmittance shall be 90 percent or greater at 254 nanometers (nm).

15. Each quarter, samples of the recycled water shall be collected and analyzed as follows, and any positive results shall be reported to the Department and RWQCB in the next monthly report:

    - Unregulated chemicals in Table 64450, Chapter 15, Title 22, CCR, Drinking Water Quality and Monitoring Requirements;
    - Priority toxic pollutants (chemicals listed in the Water Quality Standards, Establishment of Numeric Criteria for Priority Toxic Pollutants for the State of California, and 40 CFR Part 131, Federal Register 65 (97), May 18, 2000, p. 31682); and
    - The following chemicals with State notification levels: N-nitrosodimethylamine (NDMA), 1,4-dioxane, and perchlorate.

    The Department may request WBMWD to further investigate positive results and identify, if appropriate, corrective actions. An investigation may include such actions as positive result confirmation, comparison to diluent water quality, groundwater monitoring, source control and/or treatment as specified in Condition No. 4.

    After the first year of operation, the Department may allow the monitoring frequency to be reduced to annually for the above chemicals based on the initial sample results.

    Each year, the District shall collect and analyze samples of the recycled water for endocrine disrupting chemicals and pharmaceuticals specified by the Department and by using methods accepted by the Department. The results of this monitoring shall be submitted to the Department and RWQCB annually.

16. The District shall demonstrate the efficacy of the AOP system (advanced oxidation/ disinfection processes) through a Department approved commingling study or equivalent.

17. Each year, the District shall collect samples of the recycled water and conduct a Tentatively Identified Chemicals (TIC) Analysis. The results of this monitoring shall be submitted to the Department and RWQCB annually.

18. The District shall submit an annual report of findings prepared by an independent, qualified engineer registered in California and experienced in the field of advanced wastewater treatment for groundwater recharge regarding the operation of the WBWRP facilities and the results of the monitoring and investigations of the impacts of recycled water injection at the Barrier. This report shall demonstrate a mass balance to ensure that blending is occurring in the aquifer for the initial phase of operation. Injection recharge water flow paths shall be determined annually from groundwater elevation contours and compared to the flow and transport model's flow paths. The flow and transport model shall be updated to match as closely as possible the actual flow patterns

observed within the aquifer if the flow paths have significantly changed. This report shall also include Title 22 drinking water quality data for the nearest domestic water supply well in the vicinity of the injection operation at the Barrier. Prior to start-up of the WBWRP Expansion Project, tracers will need to be identified. It is not determined at this time whether intrinsic tracers are acceptable to the Department or if the WBMWD will need to add artificial tracers to track the flow paths of the recycled water.

19. To ensure that the WBWRP Expansion meets all of the performance criteria for the purposes of protecting health, the WBMWD shall operate all equipment and facilities for treatment and recharge at levels of peak performance in order to limit the presence of contaminants in the recycled water. An operations plan shall be initially developed prior to start-up and updated as required. This operations plan shall include all equipment and contingency plans in order to achieve these peak performance levels to include operations, maintenance and monitoring procedures for normal, start-up, off-spec and emergency conditions. This plan should also include a contingency plan for off-spec water and an emergency response plan.

20. A draft operations, maintenance and monitoring plan (OMM Plan) shall be developed for the WBWRP Expansion Project and submitted to the Department and the RWQCB for approval prior to startup of the WBWRP Expansion Project. The District shall operate its facilities in accordance with the approved OMM Plan. After a year of operation, the OMM Plan shall be updated and submitted to the Department and RWQCB for review and approval. The OMM Plan shall cover critical operational parameters to include routine testing procedures for the MF, RO and AOP systems, optimization of the hydrogen peroxide dose, UV dose for disinfection and reduction of light-sensitive contaminants, and all treatment processes, maintenance and calibration schedules for monitoring equipment, process alarm set points, and response procedures for alarms in each treatment process of the WBWRP, including criteria for diverting recycled water if water quality requirements are not met, start-up, and emergency response and contingency plans. During the first year of operation of the WBWRP Expansion, all treatment processes shall be optimized to reduce contaminant levels. The results of these initial optimization efforts shall be incorporated into the updated OMM Plan. The OMM Plan shall include staffing levels with applicable certifications levels for WBWRP operations personnel. Significant changes in the operation of any of the treatment processes shall be reported to the Department and RWQCB. Significant changes in the approved OMM Plan which may include provisions to comply with Condition No. 4 must be approved by the Department and RWQCB prior to instituting changes.

21. At the Barrier, the recycled water shall be retained in the Basin for a minimum of 12 months prior to being withdrawn at a domestic water supply well. A numerical model, tracer, or other method shall be used to determine the underground retention time and recycled water contribution to each aquifer. If a tracer is used, the tracer shall be determined prior to start-up.

22. At the Barrier, no domestic drinking water wells shall be allowed within a buffer zone defined by the area less than 2,000 feet and 12 months underground travel time from the Barrier.

23. Ordinances that effectively prevent the use of groundwater for drinking water purposes and construction of any domestic supply wells within the area required to achieve 12 months underground retention time and 2,000 feet of horizontal separation from the Barrier shall be maintained.

24. Groundwater monitoring to detect the influence of the Barrier injection operation shall be performed. A monitoring well shall be sited at a location within approximately three months underground travel time of the Barrier injection wells and at additional intermediate points between the Barrier and the nearest downgradient domestic water supply well, and such that samples can be obtained independently from each aquifer potentially conveying the recharge water. Monitoring well locations shall be determined by a numerical model, tracer, or other method to determine the estimated underground travel time from the recharge operation to the monitoring well sites. If a tracer is used, the tracer shall be determined prior to start-up.

25. At a minimum, one new multi-depth groundwater monitoring well shall be constructed in Redondo Beach between the Barrier injection wells and the nearest domestic water supply well, Cal Water 12-01. The new monitoring well shall be installed approximately three months underground travel time from the Barrier in compliance with Condition No. 23. For the new monitoring well, samples shall be taken independently from the aquifers receiving the injection water as follows: (1) 200-ft Sand (Gage) Aquifer; (2) Silverado Aquifer; and (3) Lower San Pedro Aquifer. Two existing monitoring wells, 17B and 17C, located approximately two to three years travel time from the Barrier to the Cal Water 12-01 production well, shall also be monitored. For well 17B, samples shall be taken independently from the 200-ft Sand (Gage) and Silverado Aquifers receiving the injection water. For well 17C, samples shall be taken from the Lower San Pedro Aquifer.

26. The groundwater monitoring program shall be periodically reviewed and modified based on results of the monitoring program. Changes to the monitoring program, including well locations, shall be approved by the Department and the RWQCB.

27. Each quarter, at a minimum, samples shall be collected from the aquifers and at the depths listed above at each monitoring well and analyzed for the following:

    - TOC;
    - Total nitrogen;
    - Constituents and characteristics in CCR, Title 22, Chapter 15, Tables 64449-A and 64449-B;

- Total coliform levels; and
- Any water quality constituents specified by the Department based on the results of the recycled water monitoring conducted pursuant to these analyses.

If any of the monitoring results indicates that a maximum contaminant level has been exceeded or that coliforms are present, the District shall notify the Department within 48 hours of receiving the results and make note of any positive findings in the quarterly report submitted to the RWQCB.

28. The District shall submit all water quality data groundwater monitoring in a format acceptable to the Department and RWQCB. Analytical results shall be reported to the current Department electronically using the Electronic Deliverable Format as defined in the current Electronic Deliverable Format (EDF) prepared by the Department.

29. During the initial 75 percent or less (up to 12.5 mgd) RWC period operation period, the District shall submit annually a report to the Department and the RWQCB evaluating the compliance with the minimum underground retention time, distance to the nearest point of extraction, blending, and the maximum RWC requirements. The annual report shall include water quality data on turbidity, coliforms, total nitrogen, regulated contaminants, TOC, and non-regulated contaminants compliance. The annual report shall also include a summary of corrective actions taken as a result of violations, suspensions of recharge, detections of monitored constituents and any observed trends, information on the travel of the recycled water, description of any changes in operation of any unit processes or facilities, and description of any anticipated changes, including any impacts on other unit processes.

30. An independent advisory panel shall provide scientific peer review prior to the next expansion phase of the WBWRP. Members of the advisory panel, as a minimum, shall have expertise in the fields of toxicology, engineering geology or hydrogeology, microbiology, chemistry, and engineering with experience in the fields of wastewater treatment and public water supply. The engineer and the engineering geologist or hydrogeologist shall be registered in California.

31. Prior to the onset of operation, the WBWRP shall have in place a resolution adopted by its governing board that it will be responsible for developing a plan for providing an alternative source of domestic water supply, or a Department approved treatment mechanism, to any user whose domestic water well is found to violate California drinking water quality regulations as a direct result of the GRRP or when CDHS makes an analysis and finding that the domestic water well is unsuitable for human consumption as a direct result of the GRRP. Such alternative sources can include water delivered for blending of the producing well, imported water, water produced at a well head treatment plant, and water produced from new wells. The WBMWD shall notify the Department in a timely manner, when such a determination is made.

32. The District shall provide an update to the 2002 engineering report every five years to the Department and the RWQCB.

Provided that the District meets all of the above conditions and findings of fact, the Department finds that the WBWRP Expansion and Barrier Project can provide injection recharge water that will not degrade the groundwater basin as a source of water supply for domestic purposes.

December 15, 2004
Date

Cindy Forbes, P.E.
Chief of the Southern California Branch
Drinking Water Field Operations
State of California Department of Health Services
Hearing Officer

ATTACHMENT A

DHS Public Hearing – West Coast Basin Seawater Barrier Conservation Project Expansion

Tuesday, December 10, 2002 (10:00 am – 11:45 am)
El Segundo Library (Matsui Room)
111 N. Mariposa Avenue
El Segundo, CA 90245

NAME	ORGANIZATION INFO. (Name,Address, City, Zip Code)	TELEPHONE/FAX #s	email
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David Chang	SCWC 1920 W. Corporate Way Anaheim, CA 92801	714-535-7711 714-535-8616	dchang@scwater.com
Mike Wehner	OCWD	714 378-3297	mwehner@ocwd.
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Jeanne-Marie Bruno	Park Water Co.	(562) 923-0711	jmbruno@parkwater.com

11-155

Everyone needs court transcripts

DHS Public Hearing – West Coast Basin Seawater Barrier Conservation Project Expansion

Tuesday, December 10, 2002 (10:00 am – 11:45 am)
El Segundo Library (Matsui Room)
111 N. Mariposa Avenue
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11-156

DHS Public Hearing – West Coast Basin Seawater Barrier Conservation Project Expansion

Tuesday, December 10, 2002 (10:00 am – 11:45 am)
El Segundo Library (Matsui Room)
111 N. Mariposa Avenue
El Segundo, CA 90245

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11-157

DHS Public Hearing – West Coast Basin Seawater Barrier Conservation Project Expansion

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El Segundo Library (Matsui Room)
111 N. Mariposa Avenue
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NAME	ORGANIZATION INFO. (Name,Address, City, Zip Code)	TELEPHONE/FAX #s	email
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ATTACHMENT B

ATTACHMENT B

List of Chemicals or Parameters That Are of Concern to the California Department of Health Services and Must Be Addressed in a Source Control Program of the Sewage

Nitrite
Asbestos
Foaming Agents
Radium-226
Radium-228
Gross Alpha Activity
Tritium
Strontium-90
Gross Beta Activity
Uranium
Bromate
Bromide
Monochloroacetic Acid
Dichloroacetic Acid
Trichloroacetic Acid
Monobromoacetic Acid
Dibromoacetic Acid
1,1,2-Trichloro-1,2,2-Trifluoroethane
Bentazon
Benzo(a)pyrene
Dalapon
Di(2-ethylhexyl)adipate
Diquat
Endothall
Ethylene Dibromide
Glyphosate
Lindane
Molinate
Oxamyl
Picloram
Thiobencarb
2,4,5-TP (Silvex)
Perchlorate

Attachment T

State of California
CALIFORNIA REGIONAL WATER QUALITY CONTROL BOARD
LOS ANGELES REGION

ORDER NO. R4-2006-0009

MONITORING AND REPORTING PROGRAM NO. CI-7485
FOR
WEST COAST BASIN BARRIER PROJECT – EXPANSION PHASE III PROJECT

ISSUED TO

West Basin Municipal Water District and
Los Angeles County Department of Public Works

(File No. 93-009)

The West Basin Municipal Water District (District) and the Los Angeles County Department of Public Works (LACDPW) collectively referred to as Project Sponsors, shall implement this Monitoring and Reporting Program (MRP) on the first of the month following the month this Order was adopted.

I. SUBMITTAL OF REPORTS

1. The Project Sponsors shall submit the required reports, outlined in the following paragraphs, to the California Regional Water Quality Control Board, Los Angeles Region (Regional Board), and to the California Department of Health Services, Drinking Water Field Operations, Los Angeles Region (DHS). The reports shall be received at the Regional Board and the DHS on the dates indicated in the followings:

   A. **Quarterly Monitoring Reports** shall be received at the Regional Board by the 15th day of the second month following the end of each quarterly monitoring period according to Table M1. The first Quarterly Monitoring Report shall be received at the Regional Board and the DHS by May 15, 2006.

Table M1 – Quarterly Report Periods and Due Dates	
Reporting Period	**Report Due**
January - March	May 15
April - June	August 15
July - September	November 15
October - December	February 15

   B. **Annual Summary Report** shall be received at the Regional Board and the DHS by April 1 of each year. This Annual Summary Report shall contain a discussion of the previous year's analytical results, as well as graphical and tabular summaries of the monitoring analytical data.

C. **Updated Operations, Maintenance, and Monitoring Plan (Updated OMM Plan)** - By May 15, 2007, an Updated OMM Plan (after one year of operation) shall be submitted to the Regional Board and the DHS.

D. **Five-Year Engineering Report** shall be submitted to the Regional Board and the DHS. The first Five-Year Updated Engineering Report shall be received by May 15, 2011.

2. All reports to the Regional Board shall be addressed to the attention of the Information Technology Unit. Reference the reports to Compliance File No. CI-7485 to facilitate routing to the appropriate staff and file. Submit the monitoring reports separately from other technical reports.

3. The monitoring data shall be submitted to the Regional Board and to the DHS on hard copy, and on either a 3 1/2" computer diskette or a CD-ROM disk. The Regional Board and to the DHS may request electronic submittal of data contained in a CD-ROM disk or other appropriate electronic medium at any time. The submittal data must be IBM compatible, preferably using Microsoft Excel software.

4. The Regional Board and the State Water Resources Control Board (State Board) are developing a database compliance monitoring management system that may require the Project Sponsors to submit the monitoring reports electronically, when it becomes operational. (Note that DHS requires groundwater monitoring to be submitted to DHS by the Electronic Data Transfer, which is available in the DHS' website at http://www.dhs.ca.gov/ps/ddwem/EDT/default.htm.) The draft regulations state: "Analytical results for chemicals shall be reported directly to the Department, as follows:

   A. Analytical results of all analyses completed in a calendar quarter shall be reported to the Department no later than the 15th day following the end of the second month of the designated monitoring period.

   B. Analytical results shall be reported to the DHS electronically using the Electronic Deliverable Format as defined in The Electronic Deliverable Format (EDF) Version 1.2i Guidelines & Restrictions dated April 2001 and Data Dictionary dated April 2001."

   The District should request PSCodes from the DHS so the data can be entered by the laboratories in the DHS' database.

II. MONITORING REQUIREMENTS

1. The Project Sponsors shall monitor the flow and quality of the following according to the manner and frequency specified in this MRP:

   A. Influent to the West Basin Water Recycling Plant (Plant) from the Hyperion Treatment Plant's secondary-treated effluent;

B. Reverse Osmosis (RO) recycled water prior to blending with diluent water;

C. Blend of RO recycled water and diluent water, when applicable;

D. Nearest production Manhattan Beach Well No. 11a to the West Coast Basin Barrier (Barrier); and,

E. Receiving groundwater (all monitoring wells).

2. Monitoring shall be used to determine compliance with the requirements of this Order and shall include, but not limited to, the following:

A. Location of each sampling station where representative samples can be obtained and the rationale for the selection. The Project Sponsors must include a map, at a scale of 1 inch equals 1,200 feet or less, that clearly identifies the locations of all injection wells, monitoring wells, and production wells.

B. Sampling protocols and chain of custody procedures.

C. For groundwater monitoring, outline the methods and procedures to be used for measuring water levels; purging wells; collecting samples; decontaminating equipment; containing, preserving, and shipping samples, and maintaining appropriate documentation. Also include the procedures for handling, storing, testing, and disposing of purge and decontamination waters generated from the sampling events.

D. Laboratory or laboratories, which conducted the analyses. Include copy or copies of laboratory certifications by the California Health Services Environmental Laboratory Accreditation Program (ELAP).

E. Analytical test methods used and the corresponding reporting detection limits (RDLs).

F. Quality assurance and control measures.

3. The samples shall be analyzed using analytical methods described in 40 CFR Part 136; or where no methods are specified for a given pollutant, by methods approved by the DHS, Regional Board and/or State Board. The Project Sponsors shall select the analytical methods that provide RDLs lower than the limits prescribed in this Order. For those constituents that have drinking water notification levels (NLs) and/or public health goals (PHGs), the RDLs shall be equal to or lower than either the NLs or the PHGs (note this is not always feasible). Every effort should be made to analyze Chemicals of Concern to the Regional Board in Attachment A-8 using the least RDL possible.

4. The Project Sponsors shall instruct its laboratories to establish calibration standards so that the RDLs (or its equivalent if there is a different treatment of samples relative

to calibration standards) are the lowest calibration standard. At no time shall the Project Sponsors use analytical data derived from extrapolation beyond the lowest point of the calibration curve.

5. Upon request by the Project Sponsors, the Regional Board, in consultation with the DHS and the State Board Quality Assurance Program, may establish RDLs, in any of the following situations:

   A. When the pollutant has no established method under 40 CFR 136 (revised May 14,1999, or subsequent revision);

   B. When the method under 40 CFR 136 for the pollutant has a RDL higher than the limit specified in this Order; or

   C. When the Project Sponsors agree to use a test method that is more sensitive than those specified in 40 CFR Part 136.

6. The laboratory conducting the analyses shall be certified by the ELAP or approved by the DHS, Regional Board, or State Board, for a particular pollutant or parameter for analyses where ELAP certification is available.

7. Water samples must be analyzed within allowable holding time limits as specified in 40 CFR Part 136.3. All QA/QC analyses must be run on the same dates that samples are actually analyzed. All labs shall follow Standard Methods and ELAP requirements for quality assurance and control. The Project Sponsors shall retain the QA/QC documentation in its files and make available for inspection and/or submit them when requested by the Regional Board. Proper chain of custody procedures must be followed and a copy of this documentation shall be submitted with the quarterly report.

8. For all bacterial analyses, sample dilutions should be performed per standard methods or ELAP specifications. The detection methods used for each analysis shall be reported with the results of the analyses.

9. Quarterly effluent analyses shall be performed during the months of February, May, August, and November. Semiannual effluent analyses shall be performed during the months of February and August. Should there be instances when monitoring could not be done during these specified months, the Project Sponsors shall notify the Regional Board, state the reason why the monitoring could not be conducted, and obtain approval from the Executive Officer for an alternate schedule. Results of quarterly analyses shall be reported in the quarterly monitoring report following the analysis.

10. For unregulated chemical analyses (dichlorodifluoromethane, ethyl-tert-butyl ether, perchlorate, tert-butyl alcohol, 1,2,3-trichloropropane, and vanadium), endocrine disrupting and pharmaceutical chemicals, the Project Sponsors should select methods according to the following approach:

    A. Use drinking water methods, if available;

B. Use DHS-recommended methods for unregulated chemicals, if available;

C. If there is no DHS-recommended drinking water method for a chemical, and more than a single EPA-approved method is available, use the most sensitive of the EPA-approved methods;

D. If there is no EPA-approved method for a chemical, and more than one method is available from the scientific literature and commercial laboratory, after consultation with DHS, use the most sensitive method;

E. If no approved method is available for a specific chemical, the Project Sponsors' laboratory may develop or use its own methods and should provide the analytical methods to DHS for review. Those methods may be used until DHS-recommended or EPA-approved methods are available.

F. If the only method available for a chemical is for wastewater analysis (e.g., a chemical listed as a priority pollutant only), sample and analyze for that chemical in the treated wastewater immediately prior to reverse osmosis treatment to increase the likelihood of detection. Use this approach until the Project Sponsors' laboratory develops a method for the chemical in drinking water, or until a DHS-recommended or EPA-approved drinking water method is available.

G. The Project Sponsors are required to inform the Regional Board, in event that D, E, F is occurring.

11. For endocrine disrupting and pharmaceutical chemical analyses

A. These chemicals (see MRP Section IV, Item 2.B, Footnotes [12] and [13] are being collected for information purposes; there are no standards for the contaminants listed below and no standards are anticipated at this time and analytical methods may not be widely available. Should the Regional Board or the DHS acceptable analytical methods be available, these methods may be used.

B. Some interested parties have asked for some clarification of what would happen if any of these contaminants are found. In response, the DHS offers this: Monitoring for these chemicals is viewed as a diligent way of assessing and verifying RO recycled water quality characteristics, which can be useful in addressing issues of public perception about the safety of recharge projects. Further, should there be a positive finding, the Project Sponsors and the DHS can give the results due consideration as to whether it is of concern or not. Just what such consideration might entail would depend on the knowns and unknowns of the particular chemical, including its potential health effects at the given concentration, the source of the chemical, as well as possible means of better control to limit its presence, treatment strategies if necessary, and other appropriate actions.

III. REPORTING REQUIREMENTS

The Project Sponsors shall submit all reports, shown on Section I SUBMITTAL OF REPORTS to the Regional Board and the DHS by the dates indicated. All quarterly and annual monitoring reports should contain a separate section titled "Summary of Non-Compliance", which discusses the compliance records and corrective actions taken or planned that may be needed to bring the discharge into full compliance with water recycling requirements. This section shall clearly list all non-compliance with water recycling requirements, as well as all excursions of effluent limitations.

1. Quarterly Reports

A. These reports shall include, at a minimum, the following information:

a. The volume of the influent, RO recycled water injected, and potable water injected into the Barrier. If no RO recycled water was injected, or delivered for blending and injection, into the Barrier during the quarter, the report shall so state.

b. The date and time of sampling and analyses.

c. All analytical results of samples collected during the monitoring period of the influent, RO recycled water, blend of RO recycled water and potable water injected, and groundwater.

d. Records of any operational problems, plant upset and equipment breakdowns or malfunctions, and any diversion(s) of off-specification RO recycled water and the location(s) of final disposal.

e. Discussion of compliance, noncompliance, or violation of requirements.

f. All corrective or preventive action(s) taken or planned with schedule of implementation, if any.

g. Certification by the Project Sponsors that no groundwater for drinking purposes has been pumped from wells within 2,000 feet from the injection wells in the barrier and from the Lower San Pedro Aquifer in the area between 2,000 feet from the Barrier and domestic Manhattan Beach Well No. 11a.

h. The name and address of the hauler(s), along with quantities hauled during the quarter and the location of the final point of disposal, of the waste, which would ordinarily have been discharged under this permit, but was hauled off-site, shall be submitted. If no wastes are hauled during the reporting period, the District shall make a statement to that effect.

i. The UV system average daily dose. The transmittance, UV intensity and operational dose need to be continuously monitored and a summary provided.

j. Monthly average recycled water contribution (RWC) calculation including a 60-month RWC graph.

k. Verification of compliance with the 20 week running average TOC in numerical and graphical formats.

B. For the purpose of reporting compliance with numerical limitations, analytical data shall be reported using the following reporting protocols:

a. Sample results greater than or equal to the RDL must be reported "as measured" by the laboratory (i.e., the measured chemical concentration in the sample); or

b. Sample results less than the RDL, but greater than or equal to the laboratory's method detection limit (MDL), must be reported as "Detected, but Not Quantified", or DNQ. The laboratory must write the estimated chemical concentration of the sample next to DNQ as well as the words "Estimated Concentration" (may be shortened to Est. Conc.); or

c. Sample results less than the laboratory's MDL must be reported as "Not-Detected", or ND.

C. If the Project Sponsors sample and perform analyses (other than for process/operational control, startup, research, or equipment testing) on any sample more frequently than required in this MRP using approved analytical methods, the results of those analyses shall be included in the report. These results shall be reflected in the calculation of the average used in demonstrating compliance with average effluent, receiving water, etc., limitations.

D. The Regional Board may request supporting documentation, such as daily logs of operations.

2. **Annual Summary Reports** shall include, at a minimum, the following information:

A. Tabular and graphical summaries of the monitoring data (secondary-treated effluent, RO recycled water, blend, and groundwater) obtained during the previous calendar year.

B. Discussion of the compliance record and corrective or preventive action(s) taken or planned that may be needed to bring the RO recycled water into full compliance with the requirements in this Order.

C. An in-depth discussion of the results of the groundwater monitoring programs conducted during the previous year includes:

a. A demonstration of a mass balance to determine the portion of RO recycled water in the groundwater for the initial phase of operation;

b. Injection RO recycled water flow paths determined annually from groundwater elevation contours;

c. A flow and transport model that shall be developed/revised to match as closely as possible the actual flow patterns observed within the aquifer;

d. Title 22 drinking water quality data for the nearest domestic water supply Manhattan Beach Well No. 11a.

Temporal and spatial trends in the data shall be analyzed, with particular reference to comparisons between stations with respect to distances from the monitoring wells and comparisons to data collected during previous years. Appropriate statistical tests and indices, subject to approval by the Executive Officer, shall be calculated and included in the annual report.

D. The description of any changes and anticipated changes including any impacts in operation of any unit processes or facilities shall be provided.

E. A list of the analytical methods employed for each test and associated laboratory quality assurance/quality control procedures shall be included. The report shall restate, for the record, the laboratories used by the Project Sponsors to monitor compliance with this Order, their status of certification, and provide a summary of performance.

F. The report shall confirm operator certification and provide a list of current operating personnel, their responsibilities, and their corresponding grade of certification.

G. The report shall also contain detailed information, frequency, and conclusions of advisory panel meetings and the list of the advisory panel.

H. The annual report shall be prepared under the direction of a qualified engineer registered in the State of California, or a certified hydrogeologist in California, and experienced in the field of advanced wastewater treatment for groundwater recharge regarding the operation of the Expansion Phase III Project's facilities and the results of the monitoring and investigation of the impacts of RO recycled water injection at the Barrier.

3. An **Updated OMM Plan** shall discuss conformance with the Plant's Operations, Maintenance, and Monitoring Plan for operations, maintenance, and monitoring of the facilities, the date the plan was last reviewed, and whether the plan is valid for the current facilities. This **Updated OMM Plan** shall also contain detailed information, frequency, and conclusions of advisory panel meetings and the list of advisory panel. See Permit Section VII, Item 6 for the more detailed information.

4. A **Five-Year Engineering Report** covers compliance and groundwater flow and transport reports.

   A. Compliance report shall include the following information:

      a. Compliance with all specifications, requirements, and provisions of this accompanying Order, including the 12-month retention time provision (set forth in Section IV, Item 6), the 2,000-foot horizontal separation provision (set forth in Section IV, Item 7), as well as any new regulations pertaining to groundwater recharge with RO recycled water that become effective after the effective date of this Order.

      b. Evaluation of the ability of this project to comply with all regulations and provisions over the ensuring five years.

   B. This report shall summarize the groundwater flow and transport including the injection and extraction operations for the Barrier during the previous five calendar years. This Report shall also use the most current data for the evaluation of the transport of RO recycled water; such evaluations must include, at a minimum, the following information:

      a. Total quantity of water injected into each major aquifer, and the proportions of RO recycled water and diluent water that comprise the total quantity;

      b. Estimates of the rate and path of flow of the injected water within each major aquifer;

      c. Projections of the arrival time of the RO recycled water at the closest extraction Manhattan Beach Well No. 11a, and the percent of RO recycled water at the wellheads.

      d. Clear presentation on any assumptions and/or calculations used for determining the rates of flow and for projecting arrival times and dilution levels.

      e. A discussion of the underground retention time of RO recycled water, a numerical model, tracer or other methods used to determine the RO recycled water contribution to each aquifer.

      f. A revised flow and transport model to match actual flow patterns observed within the aquifer if the flow paths have significantly changed.

      g. This report shall also include revised estimates, if applicable, on hydrogeologic conditions including the retention time and the amount of the RO recycled water in the aquifers and at the production well field at the end of the five year reporting period. The revised estimates shall be based upon actual data collected during that year on recharge rates (including RO

recycled water, native water, and portable water), hydrostatic head values, groundwater production rates, basin storage changes, and any other data needed to revise the estimates of the retention time and the amount of the RO recycled water in the aquifers and at the production well field. Significant differences, and the reasons for such differences, between the original estimates presented in the Engineering Report, March 1993 and the revised estimates, shall be clearly presented. Additionally, the Project Sponsors shall use the most recently available data to predict the retention time of RO recycled water in the groundwater aquifers.

C. The Five-Year Engineering report shall contain detailed information, frequency, and conclusions of advisory panel meetings and the list of the advisory panel.

D. This Five-Year Engineering report shall be prepared under the direction of a properly qualified engineer and geologist registered in California and experienced in the field of hydrogeology.

IV. MONITORING PROGRAMS

1. Influent Monitoring

A. Influent monitoring is required to:

a. Determine compliance with water quality conditions and standards.

b. Assess the Plant performance.

B. The influent sampling station is located prior to secondary treated water entering the Automatic Strainers (exclusively designed for the Barrier Treatment Process) of the Plant. Influent samples shall be obtained on the same day that final effluent samples from the reverse osmosis are obtained. The date and time of sampling shall be reported with the analytical values determined. Table M2 shall constitute the influent monitoring program:

Table M2 – Influent Monitoring

Constituents	Units	Type of Sample	Minimum Frequency of Analysis
Total waste flow	mgd	Recorder	Continuous[1]
pH	pH	Recorder	Continuous[1]
Total suspended solids	mg/L	24-hour comp.	Daily
Total organic carbon (TOC)	mg/L	Grab	Twice a week[2]
$CBOD_5$ 20°C	mg/L	24-hour comp.	Weekly
Nitrosodimethylamine (NDMA)[3]	µg/L	Grab	Monthly

Footnote:

[1]. For those constituents that are continuously monitored, the Dichargers shall report the monthly minimum and maximum, and daily average values.

[2]. For one year after initial startup, the District shall collect and analyze a grab sample twice a week; and, subsequently, the DHS may allow the District to collect and analyze weekly grab samples, based on its review of the first year of data.

[3]. The sampling for NDMA may be incorporated into the NDMA sampling of the Hyperion Treatment Plant conducted by the City of Los Angeles Bureau of Sanitation, provided that the sampling is performed using the same analytical method and laboratory.

2. **RO Recycled Water Monitoring**

A. Effluent monitoring is required to:

a. Determine compliance with the Permit conditions;

b. Identify operational problems and aid in improving plant performance; and,

c. Provide information on wastewater characteristics and flows for use in interpreting water quality and biological data.

B. An effluent sampling station shall be established where representative samples of RO recycled water can be obtained. For this injection project, RO recycled water samples shall be obtained from the effluent channel downstream of the sodium hydroxide injection point. Should there be any changes in the sampling station, the proposed station shall be approved by the Executive Officer prior to its use. Table M3 shall constitute the effluent monitoring program:

Table M3 – RO Recycled Water Monitoring

Constituent/Parameters	Units	Type of Sample	Minimum Frequency of Analysis
Total RO recycled water flow	mgd	Recorder	Continuous[1]
pH	pH units	Recorder	Continuous[1]
Turbidity	NTU	Recorder	Continuous[1,2]
Conductivity	µS/cm	Recorder	Continuous[1]
Total coliform	MPN/100 ml	Grab	Daily
Total organic carbon (TOC)	mg/L	Grab	Weekly
Temperature	°F	Grab	Weekly

Table M3 – RO Recycled Water Monitoring			
Constituent/Parameters	**Units**	**Type of Sample**	**Minimum Frequency of Analysis**
Oil & Grease	mg/L	Grab	Weekly
$CBOD_5$ 20°C	mg/L	24-hour comp.	Weekly
Total nitrogen[3]	mg/L	24-hour comp./Grab	Twice a week
Inorganic[4, 5] with primary MCL	µg/L	Grab	Quarterly
Radioactivity[5, 6]	PCi/L	24-hour comp./Grab	Quarterly
Regulated organic chemicals[5,7]	µg/L	24-hour comp./Grab	Quarterly
Disinfection byproduct[5,8]	µg/L	24-hour comp./Grab	Quarterly
General physical[9]	—	Grab	Quarterly
General minerals[9]	mg/L	Grab	Quarterly
Ethyl-tert-butyl ether (ETBE)	µg/L	Grab	Quarterly[10]
Tert-amyl-methyl ether (TAME)	µg/L	Grab	Quarterly[10]
N-Nitrosopyrrolidine	µg/L	Grab	Quarterly[10]
Chemicals of Concern[11]	µg/L	Grab	Quarterly[10]
Endocrine disrupting chemicals[12]	µg/L	Grab	Annually
Pharmaceuticals and other chemical[13]	µg/L	Grab	Annually
TIC[14]	µg/L	Grab	Annually
Remaining priority pollutants[15]	µg/L	Grab	Quarterly[10]

Footnote:

[1]. For those constituents that are continuously monitored, the Project Sponsors shall report the monthly minimum and maximum, and daily average values.

[2]. The turbidity of the reverse osmosis product water shall be continuously measured with at least one reading every 1.2 hours and recorded.

[3]. Nitrogen species include Nitrate-N, Nitrite-N, Ammonia-N, and Organic-N. Twice weekly samples shall be taken at least 3 days apart.

[4]. See Attachment A-2 for specific constituents to be monitored.

[5]. Prior to the commencement of recharge via injection of RO recycled water, at least one 24-hour composite or grab sample of RO recycled water shall be collected and analyzed to determine compliance with primary maximum contaminant levels referenced above for inorganic chemicals, radionuclides, organic chemicals, and disinfection byproducts, and with action levels for lead and copper referenced above and to demonstrate the effectiveness of the

treatment process. The results for the initial RO recycled water quality analysis shall be submitted to the DHS and Regional Board.

[6]. See Attachment A-3 for specific constituents to be monitored.

[7]. See Attachment A-4 for specific constituents to be monitored.

[8]. See Attachment A-5 for specific constituents to be monitored.

[9]. See Attachment A-6 for specific constituents to be monitored.

[10]. After the first year of operation/injection, the DHS may allow the monitoring frequency to be reduced to annually, based on the initial sample results.

[11]. Prior to the commencement of recharge via injection of RO recycled water, at least one grab sample of RO recycled water shall be collected and analyzed to determine compliance with concentrations for Chemicals of Concern to the Regional Board listed in Attachment A-8 to demonstrate the effectiveness of the treatment process. The results for the initial RO recycled water quality analysis shall be submitted to the DHS and Regional Board.

[12]. Endocrine disrupting chemicals include ethinyl estradiol, 17-B estradiol, estrone, bisphenol A, nonylphenol and nonylphenol polyethoxylate, octylphenol and octylphenol polyethoxylate, and polybrominated diphenyl ethers. The analytical methods for these chemicals should be selected using methods in Section II.10.

[13]. Pharmaceuticals and other chemicals include acetaminopen, amoxicillin, azithromycin, caffeine, carbamazepine, ciprofloxacin, ethylenediamine tetra-acetic acid (EDTA), gemfibrozil, ibuprofen, iodinated contrast media, lipitor, methadone, morphine, salicylic acid, and triclosan. The analytical methods for these chemicals should be selected using methods in Section II.10.

[14]. See Finding No. 21.C. of this accompanying Order and Section IV.2.C. of M&RP.

[15]. See Attachment A-9 for specific constituents to be monitored.

C. Evaluation of Tentatively Identified Chemical (TIC) Analysis

The results of the TIC analysis shall be evaluated in the following manner:

a. The RO recycled water TIC peak(s) not detected – If the RO recycled water does not appear to detect any TIC peak(s), the TIC evaluation is complete, and monitoring will continue at regular intervals. In this manner, the use of the most current commercially available standardized analytical method will have demonstrated that the hypothesized risks associated with injection of 100% RO recycled water are no greater than those based on the currently approved criteria, which includes 25% dilution with the alternative potable water supply.

b. The RO recycled water TIC peak(s) detected

i. The RO recycled water shall be re-analyzed (using the broad screening TIC analysis technique) within 30 days. If the previous result is confirmed, and the Regional Board and the DHS shall be notified.

ii. Re-analyzing of the RO recycled water using more sensitive (detecting targeted compounds) and standardized techniques shall be conducted within 30 days.

iii. Re-analyzing of RO recycled water and alternative supply (detecting targeted compounds) shall be sampled within 30 days.

iv. The RO recycled water shall be re-analyzed along with alternative supply. If the previous results are confirmed, the Regional Board and the DHS shall be notified and groundwater sampling shall be arranged within 30 days.

v. Groundwater (nearest "indicator well") shall be analyzed, only if there is a reasonable amount of certainty that RO recycled water has reached this well.

vi. If constituent(s) are detected in the nearest "indicator well", the Regional Board and the DHS shall be notified, and a health effects literature review shall be conducted to attempt to determine whether there is any health significance for any constituents tentatively identified in the TIC analysis or, if justified, appropriate action plan shall be evaluated in consultation with the Regional Board and the DHS.

3. **Diluent Water Monitoring**

A. Diluent water shall be monitored quarterly for nitrate and nitrite. Within 48 hours of being informed by the laboratory of the nitrite plus nitrate nitrogen result or the nitrate nitrogen result greater than 10 mg/L or the nitrite nitrogen result is greater than 1 mg/L, a confirmation sample shall be collected and analyzed. If the average of the initial and confirmation samples exceeds 10 mg/L as nitrate nitrogen or as nitrite and nitrate nitrogen, or exceeds 1 mg/L as nitrite nitrogen, Project Sponsors shall notify the DHS and Regional Board within 48 hours of receiving the confirmation sample result and:

a. Investigate the causes of the exceedance and make appropriate corrections;

b. Collect weekly and analyze two grab or 24-hour composite samples at least three days apart; and,

c. Suspend injection until appropriate corrections are made, if the average of all samples collected over the ensuring two-week period exceeds the applicable criteria.

B. It is not necessary to monitor diluent water at 100% RO recycled water injection.

4. **Blended Injection Water Monitoring**

Unless otherwise specified herein, sampling stations shall be established where representative samples of blended injection water can be obtained. Samples may be obtained at a single station, provided that the station is representative of blended injection water after blending at the Barrier Blend Station. Each sampling station shall be identified and approved by the Executive Officer prior to its use. It is not necessary to perform this item at 100% RO recycled water injection. Table M4 sets forth the minimum required constituents to be monitored in the blended injection water at the Barrier Blend Station.

Table M4 – Blended Injection Water Monitoring

Constituent	Units	Type of Sample	Minimum Frequency of Analysis
Total Blended Flow	mgd	---	Total monthly
Chlorine residual	mg/L	Grab	Weekly
TDS	mg/L	Grab	Weekly
Sulfate	mg/L	Grab	Weekly
Chloride	mg/L	Grab	Weekly
Boron	mg/L	Grab	Weekly
Total nitrogen [1]	mg/L	Grab	Twice a week

Footnote:

[1]. Total nitrogen shall be defined as the sum of ammonia, nitrite, nitrate, and organic nitrogen concentrations, expressed as nitrogen. Each week, two samples shall be collected at least three days apart if blended with RO recycled water.

5. **Groundwater Monitoring**

A. The Project Sponsors shall monitor the quality of groundwater to assess any impact(s) from the recharge of blended injection water. Representative samples of groundwater shall be collected from the shallowest to the deepest, including the 200-Ft, Silverado, and Lower San Pedro aquifers. Table M5 sets forth the minimum constituents and parameters for monitoring groundwater quality in monitoring wells (LACDPW Well Nos. WB1, 9B, 14B, 17B, 17C, 609A, 703G, 735A, and 1318N).

Table M5 – Groundwater Monitoring			
Constituents/parameters	**Units**	**Type of Sample**	**Minimum Frequency of Analysis**
Water level elevation[1]	feet	---	Quarterly
Total organic carbon (TOC)	mg/L	Grab	Quarterly
Total coliform	MPN/100ml	Grab	Quarterly
$CBOD_5$ 20°C	mg/L	Grab	Quarterly[2]
Oil and grease	mg/L	Grab	Quarterly
Total nitrogen	mg/L	Grab	Quarterly
Boron	mg/L	Grab	Quarterly
Suspended solid	mg/L	Grab	Quarterly[2]
Turbidity	NTU	Grab	Quarterly[2]
Inorganic with primary MCL[3]	µg/L	Grab	Quarterly
Radioactivity[4]	PCi/L	Grab	Quarterly[2]
Regulated organics chemicals[5]	µg/L	Grab	Quarterly[2]
Disinfection byproducts[6]	µg/L	Grab	Quarterly[2]
General physical[7]		Grab	Quarterly
General minerals[7]	µg/L	Grab	Quarterly
Ethyl-tert-butyl ether (ETBE)	µg/L	Grab	Semiannually[8]
Tert-amyl-methyl ether (TAME)	µg/L	Grab	Semiannually[8]
N-Nitrosopyrrolidine	µg/L	Grab	Semiannually[8]
Chemicals of Concern[9]	µg/L	Grab	Semiannually[8]
Remaining priority pollutants[10]	µg/L	Grab	Semiannually[8]

Footnote:

[1]. Water level elevations must be measured to the nearest 0.01 feet, and referenced to mean sea level.

[2]. Before one year of RO recycled water approaching the monitoring wells, the sampling frequency is quarterly. After one year to monitor groundwater, the sampling frequency will be lengthened to a semi-annual basis for selected compounds that were not detected during the first year monitoring. However, should any monitored compound exceed the maximum contaminant levels (and is not a preexisting condition) at the advanced treatment facility or in the groundwater during any sampling period, the frequency of sampling will be increased to a quarterly basis. Semiannual sampling of the monitored compound will resume when the compound again becomes compliant with the water quality standards.

[3]. See Attachment A-2 for specific constituents to be monitored.

[4]. See Attachment A-3 for specific constituents to be monitored.

[5]. See Attachment A-4 for specific constituents to be monitored.

[6]. See Attachment A-5 for specific constituents to be monitored.

[7]. See Attachment A-6 for specific constituents to be monitored.

[8]. These chemicals shall be sampled semiannually, five to seven months apart. After the first year of operation/injection, the DHS may allow the monitoring frequency to be reduced to annually, based on the initial sample results.

[9]. See Attachment A-8 for specific constituents to be monitored.

[10]. See Attachment A-9 for specific constituents to be monitored.

B. If any of the monitoring results indicates that a maximum contaminant level has been exceeded or that coliforms are present, the District shall notify the DHS within 48 hours of receiving the results and make note of any positive finding in the quarterly report submitted to the Regional Board.

C. Monitoring of wells shall begin one year prior to RO recycled water reaching the wells.

V. STORM WATER MONITORING AND REPORTING

The Project Sponsors shall implement the Storm Water Monitoring Program and Reporting Requirements of the State Water Resources Control Board's General NPDES Permit No. CAS000001 and Waste Discharge Requirements for Discharges of Storm Water Associated with Industrial Activities (Order No. 97-03-DWQ).

VI. MONITORING FREQUENCIES

Monitoring frequencies may be adjusted by the Executive Officer to a less frequent basis if requested by the Project Sponsors, and if backed by statistical trends of the monitoring data.

Ordered by:

Jonathan S. Bishop
Executive Officer
Date: January 19, 2006

/DTSAI/

11-178

STANDARD PROVISIONS
APPLICABLE TO WASTE DISCHARGE REQUIREMENTS

1. DUTY TO COMPLY

The discharger must comply with all conditions of these waste discharge requirements. A responsible party has been designated in the Order for this project, and is legally bound to maintain the monitoring program and permit. Violations may result in enforcement actions, including Regional Board orders or court orders requiring corrective action or imposing civil monetary liability, or in modification or revocation of these waste discharge requirements by the Regional Board. [CWC Section 13261, 13263, 13265, 13268, 13300, 13301, 13304, 13340, 13350]

2. GENERAL PROHIBITION

Neither the treatment nor the discharge of waste shall create a pollution, contamination or nuisance, as defined by Section 13050 of the California Water Code (CWC). [H&SC Section 5411, CWC Section 13263]

3. AVAILABILITY

A copy of these waste discharge requirements shall be maintained at the discharge facility and be available at all times to operating personnel. [CWC Section 13263]

4. CHANGE IN OWNERSHIP

The discharger must notify the Executive Officer, in writing at least 30 days in advance of any proposed transfer of this Order's responsibility and coverage to a new discharger. The notice must include a written agreement between the existing and new discharger containing a specific date for the transfer of this Order's responsibility and coverage between the current discharger and the new discharger. This agreement shall include an acknowledgement that the existing discharger is liable for violations up to the transfer date and that the new discharger is liable from the transfer date on. [CWC Sections 13267 and 13263]

5. CHANGE IN DISCHARGE

In the event of a material change in the character, location, or volume of a discharge, the discharger shall file with this Regional Board a new Report of Waste Discharge. [CWC Section 13260(c)]. A material change includes, but is not limited to, the following:

(a) Addition of a major industrial waste discharge to a discharge of essentially domestic sewage, or the addition of a new process or product by an industrial facility resulting in a change in the character of the Waste.

(b) Significant change in disposal method, e.g., change from a land disposal to a direct discharge to water, or change in the method of treatment which would significantly alter the characteristics of the waste.

(c) Significant change in the disposal area, e.g., moving the discharge to another drainage area, to a different water body, or to a disposal area significantly removed from the original area potentially causing different water quality or nuisance problems.

(d) Increase in flow beyond that specified in the waste discharge requirements.

(e) Increase in area or depth to be used for solid waste disposal beyond that specified in the waste discharge requirements. [CCR Title 23 Section 2210]

6. REVISION

These waste discharge requirements are subject to review and revision by the Regional Board. [CCR Section 13263]

7. TERMINATION

Where the discharger becomes aware that it failed to submit any relevant facts in a Report of Waste Discharge or submitted incorrect information in a Report of Waste Discharge or in any report to the Regional Board, it shall promptly submit such facts or information. [CWC Sections 13260 and 13267]

8. VESTED RIGHTS

This Order does not convey any property rights of any sort or any exclusive privileges. The requirements prescribed herein do not authorize the commission of any act causing injury to persons or property, do not protect the discharger from his liability under Federal, State or local laws, nor do they create a vested right for the discharger to continue the waste discharge. [CWC Section 13263(g)]

9. SEVERABILITY

Provisions of these waste discharge requirements are severable. If any provision of these requirements are found invalid, the remainder of these requirements shall not be affected. [CWC Section 921]

10. OPERATION AND MAINTENANCE

The discharger shall, at all times, properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the discharger to achieve compliance with conditions of this Order. Proper operation and maintenance includes effective performance, adequate funding, adequate operator staffing and training, and adequate laboratory and process controls including appropriate quality assurance procedures. This provision requires the operation of backup or auxiliary facilities or similar systems only when necessary to achieve compliance with the conditions of this Order. [CWC Section 13263(f)]

11. HAZARDOUS RELEASES

Except for a discharge which is in compliance with these waste discharge requirements, any person who, without regard to intent or negligence, causes or permits any hazardous substance or sewage to be discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, shall, as soon as (a) that person has knowledge of the discharge, (b) notification is possible, and (c) notification can be provided without substantially impeding cleanup or other emergency measures, immediately notify the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State toxic disaster contingency plan adopted pursuant to Article 3.7 (commencing with Section 8574.7) of Chapter 7 of Division 1 of Title 2 of the Government Code, and immediately notify the State Board or the appropriate Regional Board of the discharge. This provision does not require reporting of any discharge of less than a reportable quantity as provided for under subdivisions (f) and (g) of Section 13271 of the Water Code unless the discharger is in violation of a prohibition in the applicable Water Quality Control plan. [CWC Section 13271(a)]

12. PETROLEUM RELEASES

Except for a discharge which is in compliance with these waste discharge requirements, any person who without regard to intent or negligence, causes or permits any oil or petroleum product to be discharged in or on any waters of the State, or discharged or deposited where it is, or probably will be, discharged in or on any waters of the State, shall, as soon as (a) such person has knowledge of the discharge, (b) notification is possible, and (c) notification can be provided without substantially impeding cleanup or other emergency measures, immediately notify the Office of Emergency Services of the discharge in accordance with the spill reporting provision of the State oil spill contingency plan adopted pursuant to Article 3.5 (commencing with Section 8574.1) of Chapter 7 of Division 1 of Title 2 of the Government Code. This provision does not require reporting of any discharge of less than 42 gallons unless the discharge is also required to be reported pursuant to Section 311 of the Clean Water Act or the discharge is in violation of a prohibition in the applicable Water Quality Control Plan. [CWC Section 13272]

13. ENTRY AND INSPECTION

The discharger shall allow the Regional Board, or an authorized representative upon the presentation of credentials and other documents as may be required by law, to:

(a) Enter upon the discharger's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of this Order;

(b) Have access to and copy, at reasonable times, any records that must be kept under the conditions of this Order;

(c) Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this Order; and

(d) Sample or monitor at reasonable times, for the purposes of assuring compliance with this Order, or as otherwise authorized by the California Water Code, any substances or parameters at any location. [CWC Section 13267]

14. MONITORING PROGRAM AND DEVICES

The discharger shall furnish, under penalty of perjury, technical monitoring program reports; such reports shall be submitted in accordance with specifications prepared by the Executive Officer, which specifications are subject to periodic revisions as may be warranted. [CWC Section 13267]

All monitoring instruments and devices used by the discharger to fulfill the prescribed monitoring program shall be properly maintained and calibrated as necessary to ensure their continued accuracy. All flow measurement devices shall be calibrated at least once per year, or more frequently, to ensure continued accuracy of the devices. Annually, the discharger shall submit to the Executive Officer a written statement, signed by a registered professional engineer, certifying that all flow measurement devices have been calibrated and will reliably achieve the accuracy required.

Unless otherwise permitted by the Regional Board Executive officer, all analyses shall be conducted at a laboratory certified for such analyses by the State Department of Health Services. The Regional Board Executive Officer may allow use of an uncertified laboratory under exceptional circumstances, such as when the closest laboratory to the monitoring location is outside the State boundaries and therefore not subject to certification. All analyses shall be required to be conducted in accordance with the latest edition of "Guidelines Establishing Test Procedures for Analysis of Pollutants" [40 CFR Part 136] promulgated by the U.S. Environmental Protection Agency. [CCR Title 23, Section 2230]

15. TREATMENT FAILURE

In an enforcement action, it shall not be a defense for the discharger that it would have been necessary to halt or to reduce the permitted activity in order to maintain compliance with this Order. Upon reduction, loss, or failure of the treatment facility, the discharger shall, to the extent necessary to maintain compliance with this Order, control production or all discharges, or both, until the facility is restored or an alternative method of treatment is provided. This provision applies, for example, when the primary source of power of the treatment facility fails, is reduced, or is lost. [CWC Section 13263(f)]

16. DISCHARGES TO NAVIGABLE WATERS

Any person discharging or proposing to discharge to navigable waters from a point source (except for discharge of dredged or fill material subject to Section 404 of the Clean Water Act and discharge subject to a general NPDES permit) must file an NPDES permit application with the Regional Board. [CCR Title 2 Section 22357]

17. ENDANGERMENT TO HEALTH AND ENVIRONMENT

The discharger shall report any noncompliance which may endanger health or the environment. Any such information shall be provided verbally to the Executive Officer within 24 hours from the time the discharger becomes aware of the circumstances. A written submission shall also be provided within five days of the time the discharger becomes aware of the circumstances. The written submission shall contain adescription of the noncompliance and its cause; the period of noncompliance, including exact dates and times, and if the noncompliance has not been corrected; the anticipated time it is expected to continue and steps taken or planned to reduce, eliminate, and prevent recurrence of the noncompliance. The Executive officer, or an authorized representative, may waive the written report on a case-by-case basis if the oral report has been received within 24 hours. The following occurrence(s) must be reported to the Executive Officer within 24 hours:

(a) Any bypass from any portion of the treatment facility.

(b) Any discharge of treated or untreated wastewater resulting from sewer line breaks, obstruction, surcharge or any other circumstances.

(c) Any treatment plant upset which causes the effluent limitation of this Order to be exceeded. [CWC Sections 13263 and 13267]

18. MAINTENANCE OF RECORDS

The discharger shall retain records of all monitoring information including all calibration and maintenance records, all original strip chart recordings for continuous monitoring instrumentation, copies of all reports required by this Order, and records of all data used

to complete the application for this Order. Records shall be maintained for a minimum of three years from the date of the sample, measurement, report, or application. This period may be extended during the course of any unresolved litigation regarding this discharge or when requested by the Regional Board Executive Officer.

Records of monitoring information shall include:

(a) The date, exact place, and time of sampling or measurements;

(b) The individual(s) who performed the sampling or measurements;

(c) The date(s) analyses were performed;

(d) The individual(s) who performed the analyses;

(e) The analytical techniques or method used; and

(f) The results of such analyses.

19. (a) All application reports or information to be submitted to the Executive Officer shall be signed and certified as follows:

(1) For a corporation – by a principal executive officer or at least the level of vice president.

(2) For a partnership or sole proprietorship – by a general partner or the proprietor, respectively.

(3) For a municipality, state, federal, or other public agency – by either a principal executive officer or ranking elected official.

(b) A duly authorized representative of a person designated in paragraph (a) of this provision may sign documents if:

(1) The authorization is made in writing by a person described in paragraph (a) of this provision.

(2) The authorization specifies either an individual or position having responsibility for the overall operation of the regulated facility or activity; and

(3) The written authorization is submitted to the Executive Officer.

Any person signing a document under this Section shall make the following certification:

"I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment. [CWC Sections 13263, 13267, and 13268]"

20. OPERATOR CERTIFICATION

Supervisors and operators of municipal wastewater treatment plants and privately owned facilities regulated by the PUC, used in the treatment or reclamation of sewage and industrial waste shall possess a certificate of appropriate grade in accordance with Title 23, California Code of Regulations Section 3680. State Boards may accept experience in lieu of qualification training. In lieu of a properly certified wastewater treatment plant operator, the State Board may approve use of a water treatment plant operator of appropriate grade certified by the State Department of Health Services where reclamation is involved.

Each plant shall be operated and maintained in accordance with the operation and maintenance manual prepared by the municipality through the Clean Water Grant Program. [CWC Title 23, Section 2233(d)]

ADDITIONAL PROVISIONS APPLICABLE TO
PUBLICLY OWNED TREATMENT WORKS' ADEQUATE CAPACITY

21. Whenever a publicly owned wastewater treatment plant will reach capacity within four years the discharger shall notify the Regional Board. A copy of such notification shall be sent to appropriate local elected officials, local permitting agencies and the press. The discharger must demonstrate that adequate steps are being taken to address the capacity problem. The discharger shall submit a technical report to the Regional Board showing flow volumes will be prevented from exceeding capacity, or how capacity will be increased, within 120 days after providing notification to the Regional Board, or within 120 days after receipt of notification from the Regional Board, of a finding that the treatment plant will reach capacity within four years. The time for filing the required technical report may be extended by the Regional Board. An extension of 30 days may be granted by the Executive Officer, and longer extensions may be granted by the Regional Board itself. [CCR Title 23, Section 2232]