

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

ORDER NO. R4-2014-xxx

**WASTE DISCHARGE REQUIREMENTS AND
WATER RECYCLING REQUIREMENTS**

FOR THE

**LEO J. VANDER LANS WATER TREATMENT FACILITY AND THE
ALAMITOS BARRIER RECYCLED WATER PROJECT**

ISSUED TO

**Water Replenishment District of Southern California and
Los Angeles County Department of Public Works**

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

I. BACKGROUND

1. The Los Angeles County Department of Public Works (Los Angeles County DPW) and the Orange County Water District (OCWD) co-own and operate the Alamitos Barrier Recycled Water Project(Barrier). Figure 1 shows the location of the Barrier.
2. Prior to the construction of the Barrier, decades of over-pumping caused the water levels in the Central Groundwater Basin and Orange County Groundwater Basin to drop, resulting in a loss of groundwater from storage and seawater intrusion into the potable aquifers, rendering portions of the basins unsuitable for beneficial use. The Barrier began operations in 1965 and is designed to protect the Central Groundwater Basin and portions of the Orange County Groundwater Basin from seawater intrusion through the creation of a pressure ridge by injection of fresh water into the Barrier through an alignment of 41 injection wells. These wells are located approximately two miles inland from the mouth of the San Gabriel River at the Los Angeles/Orange County boundary. The pressure ridge created by the Barrier prevents seawater from passing the Barrier and entering further into the groundwater basins. The injected water flows inland, providing needed replenishment water to the groundwater basins. The failure to maintain an effective seawater intrusion barrier would cause serious water quality degradation in drinking water aquifers in southeastern Los Angeles County and southwestern Orange County, and the potential loss of this water resource.
3. There are seven groundwater-bearing units defined in the vicinity of the Barrier, including from shallowest to deepest the Recent Aquifer, Zones C, B, A, and I, the Main Aquifer (also known as the Silverado Aquifer), and the Lower Main Aquifer (also known as the Sunnyside Aquifer or Lower San Pedro Aquifer). The geological

cross-section for these aquifers is illustrated in Figure 2. Due to geologic conditions, seawater intrusion has a direct pathway into the Recent Aquifer and the C, B, A, and I Zones. The deeper Main and Lower Main aquifers are protected from intrusion by the Seal Beach Fault and overlying low-permeability layers. Injection occurs into the C, B, A, and I Zones, not into the Recent, Main, or Lower Main aquifers.

4. The Water Replenishment District of Southern California (WRD) manages the Central and West Coast Groundwater Basins. WRD owns the Leo J. Vander Lans Water Treatment Facility (Vander Lans WTF or Facility) in the City of Long Beach (City) and is the purveyor of recycled water produced by the Facility that is injected into the Barrier. The City operates and maintains the Facility for WRD. Figure 3 shows the location of the Facility. Prior to 2005, only potable water was injected into the Barrier. Since October 2005, the Facility has produced up to 3 million gallons per day (mgd) of high quality advanced-treated recycled water that is injected into the Barrier in combination with potable water pursuant to Regional Water Board Order No. R4-2005-0061, State Water Board Order WQ-2006-0001, and Amendment R4-2006-0061-A01. The program of producing and delivering advanced treated recycled water to the Barrier is known as the Alamitos Barrier Recycled Water Project (Barrier).
5. Together, WRD and Los Angeles County DPW (collectively referred to as Project Sponsors) propose to produce up to 8 mgd of advanced treated recycled water for injection into the Barrier to replace the potable water currently used.
6. The County Sanitation Districts of Los Angeles County (County Sanitation Districts) own and operate the Long Beach Water Reclamation Plant (Long Beach WRP), which produces disinfected tertiary recycled water that is the source water for advanced treatment at the Facility. The City owns the rights to the recycled water produced at the Long Beach WRP. To meet the needs for additional source water at the expanded Facility, disinfected tertiary recycled water from the Los Coyotes Water Reclamation Plant (Los Coyotes WRP), also owned and operated by the County Sanitation Districts, may be used to supplement the existing supply from the Long Beach WRP.

II. PURPOSE OF ORDER

7. The treatment of recycled water at the Vander Lans WTF and injection into the Barrier were previously permitted under Order R4-2005-0061 (2005 Order), issued by the Regional Water Board on September 1, 2005, as amended by WQ-2006-0001 issued by the State Water Board on April 5, 2006 and Order No. R4-2005-0061-A01 issued by the Regional Water Board on March 6, 2014.
8. The Alamitos Barrier Recycled Water Project straddles the border between the jurisdictional areas of the Los Angeles Regional Water Board and the Santa Ana Regional Water Board. In a February 8, 2004 letter to the Santa Ana Regional Water Board, the Los Angeles Regional Water Board requested the lead on permitting the Project. This request was granted by the Santa Ana Regional Water Board in a letter dated July 30, 2004.

9. On October 23, 2012, the Project Sponsors submitted a Report of Waste Discharge requesting amendment of the Waste Discharge Requirements and Water Recycling Requirements (WDRs/WRRs) to reflect a proposal to expand the Facility and increase the volume of recycled water injected into the Barrier. The Regional Water Board found the Report of Waste Discharge to be complete on November 6, 2012.
10. On October 23, 2012, the Project Sponsors submitted an amended Title 22 Engineering Report for the expansion of the Facility to the Regional Water Board and the California Department of Public Health (CDPH). The Engineering Report was later revised in response to comments received from CDPH. A final version was submitted on March 29, 2013, for review by CDPH and the Regional Water Board, and was approved by CDPH on April 4, 2013. On June 26, 2013, CDPH held a public hearing in Lakewood, California to consider findings of fact regarding the planned Facility expansion and conditions to be imposed on the Project to ensure protection of public health and ensure that the Project will not degrade groundwater quality as a source of domestic water supply. There were no objections voiced concerning the Project at the public hearing. CDPH submitted to the Regional Water Board the Findings of Fact and Conditions for the Project adopted by CDPH on July 12, 2013 (CDPH Findings of Fact and CDPH Conditions, respectively). The CDPH found that the Project will not degrade the quality of the water in the receiving aquifers as a source of domestic water supply provided that all of the conditions are met.
11. The CDPH Findings of Fact are incorporated by reference into the findings of this Order

III. ALAMITOS BARRIER RECYCLED WATER PROJECT

12. The Vander Lans WTF is located at 7380 East Willow Street, Long Beach, California adjacent to the Long Beach WRP and between the San Gabriel River and Coyote Creek (Figure 3).
13. Description of Tertiary Treatment at Long Beach and Los Coyotes WRPs.
 - a. The primary source water for the expanded Vander Lans WTF is disinfected tertiary recycled water from the Long Beach WRP. The production of tertiary recycled water at the Long Beach WRP is regulated by WRR Order No. 97-07206. The discharge of that water to surface water is regulated under WDR Order R4-2007-0047.
 - b. In the future, disinfected tertiary recycled water may also be supplied to the Vander Lans WTF by the Los Coyotes WRP, which is regulated separately under WRR Order No. 97-07204. The discharge of that water to surface water is regulated under WDR Order R4-2007-0048.
 - c. The County Sanitation Districts maintain a comprehensive industrial and pretreatment control program approved by the United States Environmental Protection Agency (USEPA) for control of waste discharges from industrial and commercial sources into its wastewater collection system.

- d. Treatment at the Long Beach and Los Coyotes WRPs is very similar, and consists of primary sedimentation, activated sludge biological treatment with nitrification and denitrification, secondary sedimentation, inert media filtration, and chlorine disinfection treatment processes. The design capacity of the Long Beach WRP is 25 mgd. The design capacity of the Los Coyotes WRP is 37 mgd.
14. The current treatment train at Vander Lans WTF consists of microfiltration (MF) to reduce the turbidity and silt density of the feed water; reverse osmosis (RO) to remove additional salts, minerals, metal ions, organic compounds and microorganisms; ultraviolet irradiation (UV) to provide disinfection and n-Nitrosodimethylamine (NDMA) reduction; decarbonation; pH adjustment; corrosivity stabilization; and, blending with potable water. The Project Sponsors have developed an operating plan for the Vander Lans WTF, which will be updated prior to operation of the expanded Facility.
15. The Project Sponsors seek to change the quantity of the recycled water injected at the Barrier from approximately 50 percent recycled water and 50 percent potable diluent water to 100 percent recycled water. The expanded Vander Lans WTF will include some treatment enhancements and will continue to treat influent water to meet drinking water maximum contaminant levels and other limits imposed on recycled water intended for groundwater replenishment. The expanded Facility is designed to produce approximately 8,960 acre-feet of recycled water per year (AFY), which is equivalent to 8 mgd. The treatment approach and technology used at the expanded Facility is depicted in Figure 4 and described in additional detail in CDPH's Findings of Fact.
16. The Vander Lans WTF was designed to accommodate future expansion to produce up to 8 mgd of advanced treated recycled water. Prior to the commissioning of the future expanded facility in the fall of 2014, the Project Sponsors plan to conduct a series of startup tests from approximately April to August 2014. Duration of the individual tests will vary from days to weeks, and the Facility will operate between 3 to 8 mgd intermittently during the startup testing. The treatment level provided during the startup testing in accordance with Amendment R4-2005-0061-A01 will consist of the treatment train described above as required by Order No. R4-2005-061 with the addition of hydrogen peroxide immediately upstream of UV to provide advanced oxidation for removal of organics and enhanced disinfection.
17. The treatment approach and technology used at the expanded Facility to produce advanced treated recycled water is depicted in Figure 4 and will consist of the following:
- a. Influent Equalization (EQ): If tertiary effluent from the Los Coyotes WRP is used as influent to the Vander Lans WTF, the flow will be equalized in the influent EQ basin and pump-fed to the Primary Micro Filtration (MF) system. (Pumping is not required when disinfected tertiary effluent from the Long Beach WRP is used as influent to the Vander Lans WTF since the effluent from Long Beach WRP effluent has 60 to 100 pounds per square inch (psi) of pressure.)

b. Micro Filtration (MF):

- i. MF Pretreatment Chemical Addition: If tertiary effluent before chlorination from the Los Coyotes WRP is used for the Vander Lans WTF influent, then chloramination (using sodium hypochlorite and aqueous ammonia) may be added to the equalized flow to control bio-fouling of the MF and RO membranes. Additional chemical addition before MF filtration is unnecessary and will not be used if the Facility uses tertiary effluent from the Long Beach WRP only.
- ii. Primary MF Automatic Strainers: Subsequently, the flows will be fed into three (two duty and one standby) automatic self-cleaning 500-micron strainers to protect the downstream MF membranes from damage and/or fouling from large particles. The backwash waste from the Primary MF automatic strainers may be discharged to either the backwash waste (BWW) equalization basin or the Facility waste EQ basin.
- iii. Primary MF System: From the strainers, the flow will be fed into six 100-module MF skids. The MF system consists of pressurized MF units with hollow fiber, polyvinylidene fluoride membranes having a maximum pore size of 0.1 micron. The MF system is designed to produce 8.1 mgd. The MF filtrate will be stored in a break tank and the MF Units will be periodically backwashed to clean the membranes.
- iv. Backwash Treatment (BWT): The BWW flows from the Primary MF automatic strainers and Primary MF system will be equalized in the BWW EQ Basin and pumped to the dissolved air floatation (DAF) system for treatment. Ferric chloride is utilized as a coagulant injected upstream of the DAF system. DAF effluent flow will be equalized in the DAF Effluent EQ Basin and pumped to the BWT MF system, which consists of four 25-module MF skids. Similar to the Primary MF system, the BWT MF automatic strainer is provided upstream of the BWT MF membranes to protect the BWT MF membranes from damage and/or fouling from large particles. One automatic strainer will be provided as a duty unit, and one manual basket strainer will be provided as a standby. The Primary MF effluent and the BWT MF effluent will be mixed and discharged into the existing MF Filtrate Tank (or Break Tank as shown in Figure 4).

- c. Reverse Osmosis (RO): Stored MF filtrate will be pumped from the MF Filtrate Tank to the RO system, which will consist of two 2-stage RO trains in parallel and three (two duty and one standby) third stage RO trains. To control scaling and to protect the RO membranes, the pretreatment (consisting of addition of sulfuric acid for pH control, a threshold inhibitor; and cartridge filters) is provided both upstream of the two 2-stage RO trains and also immediately upstream of the third stage RO process. The RO process will produce approximately 8.0 mgd and includes a high pressure feed pump and pressure vessels. Each pressure vessel will contain high rejection thin film composite polyamide membrane elements. The entire RO system is designed for an overall 92 percent recovery rate. Permeate from the RO system will be

fed to the advanced oxidation process. Concentrated brine from the RO system will be discharged directly to County Sanitation Districts' Joint Outfall System sewer system.

- d. Ultra Violet/Advanced Oxidation Process (UV/AOP): The UV/AOP at the Vander Lans WTF will consist of ultra violet irradiation (UV) with hydrogen peroxide addition upstream of the UV trains. The UV/AOP is used to disinfect RO permeate and destroy some constituents of emerging concern (CECs) that pass through RO membranes due to their low molecular weight and low ionic charge, notably NDMA and, 1,4-dioxane. The UV system exceeds the requirements delineated in the "Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse" (August 2012) published by the National Water Research Institute (NWRI). The UV system consists of the existing (pre-expansion) system as well as an add-on system. The existing UV system consists of nine 30AL50 Trojan UVPhox™ reactors that employ low-pressure, high-output technology, with each reactor containing 30 lamps, utilized in a tower arrangement with three reactors per level over three levels. The expansion will add two new trains of three stacked D72AL75 Trojan UVPhox™ reactor chambers, where the third reactor chamber in each train is redundant and includes only one (1) 72-lamp reactor zone. There are two reactor chambers in each UV vessel. The third vessel only utilizes one of the reactors. No waste will be generated. The total nominal capacity of the existing UV system is 8.0 mgd. At this flow rate and UV transmittance of 95 percent, the delivered UV dosage from the proposed system is estimated to exceed 300 millijoule per square centimeter (mJ/cm^2).
 - e. Decarbonation: Following UV/AOP treatment, the water will pass through a decarbonator to reduce carbon dioxide, increase pH, and stabilize the product water.
 - f. Post-Treatment Systems (pH Adjustment/Corrosivity Stabilization/Disinfection): Caustic soda (sodium hydroxide) will be added to the water to increase pH, and calcium chloride will be added to reduce the potential for minerals to be leached from the cement lining used in the transmission pipeline. In order to maintain a certain threshold of total chlorine residuals required by the Los Angeles County DPW to prevent bio-fouling and clogging of the injection wells, sodium hypochlorite and aqueous ammonia will be added to the product water to maintain the required level of total chlorine residuals. The levels of sodium hypochlorite and aqueous ammonia to be added will be fine-tuned to effectively manage potential formation of disinfection byproducts.
18. The Facility may bypass or discharge partially-treated or treated water to a trunk sewer leading to the County Sanitation Districts' Joint Water Pollution Control Plant in Carson.

IV. RECYCLED WATER INJECTION SYSTEM

19. The transmission of the advanced treated recycled water from the Facility will not

change as a result of the expansion. Currently, the advanced treated recycled water is pumped westward along Willow Street to the Blend Station where it mixes with imported water before being conveyed two miles to the distribution header. From the header, the advanced treated recycled water is injected into the Barrier. The alignment of injection wells extends westward along 7th Street from Margo Avenue to the San Gabriel River, where it turns towards the south along the Los Alamitos Channel (see Figure 1 for the well alignment). Two types of injection wells were constructed at the Barrier: nested and composite. Nested wells are constructed with a single casing, but can inject water into different aquifers separated by grout seals. The composite type injection wells are comprised of casings similar to the nested casings, except that they are screened in multiple aquifer zones without grout seals between them. The injection wells include 41 wells of which 16 are single injection wells, injecting only into either the A or I aquifers; 19 are dual injection wells, injecting separately into the A/I or C/B aquifers; and seven wells are composite wells that inject simultaneously into the C/B/A/I aquifers. Distances between injection wells vary from approximately 50 feet to 1,200 feet, for a total span of approximately 1.2 miles.

20. The OCWD is in the planning stages to construct eight additional injection well locations (20 separate casings) to better control seawater intrusion into the Orange County Groundwater Basin. Total injection rates for the eight new wells are anticipated to be approximately 1,011 AFY. The location, design, and injection rates of these new wells were included in the updated modeling studies for the 2013 approved amended Engineering Report to predict travel time and movement of the injected water after their construction.

V. GROUNDWATER STUDIES

21. The April 15, 2011, *Addendum to the Five-year Engineering Report for the Barrier* contained a technical memorandum from INTERA, reviewing the ability of the Project Sponsors' groundwater model to predict the fate and transport of the recycled water through the aquifers. Between 2006 and 2010, the water in Zones C, B, A and I compared favorably to aquifer conditions predicted using the numerical flow and transport model, with a transmissivity-weighting scheme. Particle tracking simulations were used to confirm the modeled and observed break-through analysis for recycled water concentrations at the monitoring wells. Figure 1 is a map showing the injection well locations. Figure 2 is a cross section for that map delineating the aquifer zones. For the approved 2013 Engineering Report, the INTERA model was updated to include the Facility expansion plans and the 8 new injection wells that will be constructed by OCWD to improve Barrier performance. The model was used to update calculations and predictions of future recycled water fate and transport in the aquifers based on groundwater conditions after the expanded Facility and the new wells are in operation.
22. A total of 220 observation wells are currently operated at the Barrier. These wells are monitored by Los Angeles County DPW for water levels and chloride concentrations to determine the effectiveness of the seawater barrier. The monitoring wells tap the Recent, C, B, A, and I aquifers. The Project Sponsors monitor the movement of the injected recycled water using 21 observation wells at 8

- locations. The 21 wells include the eight monitoring wells where routine water quality sampling is conducted pursuant to the existing WDRs/WRRs, and 13 tracer wells, whose primary function is to trace the movement of recycled water. Prior to project initiation, CDPH concurred with the Project Sponsors that recycled water should be chemically distinct from previously injected potable water and native groundwater due to advanced treatment process, particularly RO that produces water with much lower mineral content than the other waters. Therefore, properties of the recycled water can be used as a groundwater tracer to follow recycled water movement and travel time. The tracer well program was terminated in December 2009 since it fully satisfied the 2005 WDRs/WRRs
23. The closest active domestic well to the Barrier is SB-LEI (State Well No. 05S/12W-01A03) owned and operated by the City of Seal Beach and is located approximately 4,840 feet to the east of the Barrier. Tracer studies and groundwater models determined that recycled water will travel underground for approximately 4.3 years before reaching SB-LEI in the I-Zone. Because of the tracer studies and modeling work previously done for the Project, a new tracer study is not required for the Facility expansion.
 24. Based on groundwater modeling travel time analysis of 4.3 years to the nearest drinking water well SB-LEI, and project startup in October 2005, recycled water is expected to have reached SB-LEI (Figure 5). Drinking water standards have not been exceeded at SB-LEI as a result of the injection project, as shown by the Title 22 drinking water reports. The SB-LEI well is perforated in the I-Zone, which is recharged by the Barrier, and the deeper Main and Lower Main Aquifers, which are not recharged by the Barrier. As a result, it is likely that the water produced from the well is a blend of the aquifers tapped by the well.
 25. The 2005 Order required collection of monitoring data before the start of injection of recycled water into the Barrier, and annual assessment of data collected thereafter (Figure 6). Of 230 constituents measured at ten monitoring wells (including two background wells and eight compliance monitoring wells), most stayed constant or improved in comparison to background groundwater quality information collected in 2005 and 2006. In general, water quality at the ten wells is within primary and secondary drinking water standards. Exceedances of MCLs were most commonly observed in the Recent Aquifer, the shallowest aquifer, which does not receive injection water. All of the constituents exceeding the MCLs were present during the 2005 initial background monitoring (pre-injection period) in similar concentrations except for arsenic and selenium, which have increased since 2005. Arsenic and selenium have consistently not been detected in the recycled water injected into the barrier. In the C-Zone, B-Zone, A-Zone, and I Zone Aquifers, manganese has been measured at elevated concentrations. In the Main Aquifer, which does not receive injection water, only chloride, specific conductance, and TDS were consistently observed at elevated concentrations, but the values generally show a decreasing trend from the 2005 initial background monitoring, indicating improved groundwater quality in the aquifer. Based on the review of the recycled water monitoring data for the past five years (2009-2013), arsenic, selenium, and coliform were never detected in the recycled water produced by the Facility. The highest concentration detected in the recycled water from 2009 to 2013 for chloride, total dissolved solids (TDS),

manganese, and odor are 28 milligram per liter (mg/L), 110 mg/L, 2.7 microgram per liter (µg/L), and 4 threshold odor number (TON), respectively.

VI. REGULATION OF RECYCLED WATER

26. State authority to oversee recycled water use is shared by CDPH, the State Water Board, and the Regional Water Boards. CDPH¹ is the agency with the primary responsibility for establishing water recycling 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. Legislation is expected to be adopted such that, effective July 1, 2014, the personnel in the CDPH Drinking Water Program which includes those working on permitting of recycled water projects will be organized under the State Water Board as the new Division of Drinking Water. The Regional Water Boards are responsible for issuing water reclamation requirements for the beneficial use of recycled water. The State Water Board and Regional Water Boards are responsible for issuing waste discharge requirements for the beneficial use of recycled water that includes a discharge to waters of the State.
27. The State Water 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 Water Board also adopted Resolution No. 88-012, which encourages the beneficial use of recycled water and supports water recycling projects.
28. The State Water Board adopted the Recycled Water Policy (State Water Board Resolution No. 2009-0011) on February 3, 2009, and amended the Policy on January 22, 2013. The purpose of the Recycled Water Policy is to protect groundwater resources and to increase the beneficial reuse of recycled water from municipal wastewater sources in a manner consistent with state and federal water quality laws and regulations. The Recycled Water Policy describes the respective authority of CDPH and the Regional Water Boards as follows:

Regional Water Boards shall appropriately rely on the expertise of CDPH for the establishment of permit conditions needed to protect human health. (section 5.b)

Nothing in this paragraph shall be construed to limit the authority of a Regional Water Board to protect designated beneficial uses, provided that any proposed limitations for the protection of public health may only be imposed following regular consultation by the Regional Water Board with CDPH, consistent with State Water Board Orders WQ 2005-0007 and 2006-0001. (section 8.c)

Nothing in this Policy shall be construed to prevent a Regional Water Board from imposing additional requirements for a proposed recharge

¹ Subject to adoption of appropriate legislation effective July 1, 2014, the State Water Board shall be substituted in place of each reference to CDPH in the conditions and requirements of this Order, and in the findings of this Order where appropriate.

project that has a substantial adverse effect on the fate and transport of a contaminant plume or changes the geochemistry of an aquifer thereby causing dissolution of constituents, such as arsenic, from the geologic formation into groundwater. (section 8.d)

In addition, the Policy notes the continuing obligation of the Regional Water Boards to comply with the state's anti-degradation policy, Resolution No. 68-16:

The State Water Board adopted Resolution No. 68-16 as a policy statement to implement the legislature's intent that waters of the state shall be regulated to achieve the highest water quality consistent with the maximum benefit to the people of the state. (section 9.a)

29. A 1996 Memorandum of Agreement (MOA) between CDPH and the State Water Board on behalf of itself and the Regional Water Boards allocates the primary areas of responsibility and authority between these agencies regarding the use of recycled water. The MOA provides methods and mechanisms necessary to ensure ongoing and continuous future coordination of activities relative to the use of recycled water in California. This Order includes requirements consistent with the MOA.
30. Section 13523(a) of the Water Code provides that a Regional Water Board, after consulting with and receiving recommendations from CDPH, and after any necessary hearing, shall, if it determines such action to be necessary to protect the health, safety, or welfare of the public, prescribe WRRs for water that is used or proposed to be used as recycled water. Pursuant to Water Code section 13523, the Regional Water Board has consulted with CDPH and received its recommendations. On June 26, 2013, CDPH held a public hearing to consider the proposed expansion of the Vander Lans WTF and use of recycled water for the Barrier. On July 12, 2013, CDPH transmitted to the Regional Water Board its Findings of Fact and Conditions concerning the expansion of the Vander Lans WTF.
31. 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 CDPH finds the recharge will not degrade the quality of the receiving aquifer as a source of water supply for domestic purposes. In its Findings of Facts and Conditions, CDPH determined that "provided that WRD meets all of the above conditions and findings of fact, the Department [CDPH] finds that the ABRWP [Barrier Project] can provide injection recharge water that will not degrade groundwater basins as a source of water supply for domestic purposes."
32. Section 13523(b) of the Water Code provides that reclamation requirements shall be established in conformance with the uniform statewide recycling criteria established pursuant to Water Code section 13521. Section 60320 of Title 22 currently includes requirements for groundwater recharge projects. Water Code Sections 13562 and 13562.5 require CDPH to adopt uniform water recycling criteria for groundwater recharge as emergency regulations without Office of Administrative Law review by June 30, 2014. As of the adoption of this Order, CDPH had not yet adopted uniform water recycling criteria for groundwater recharge.

VII. OTHER APPLICABLE PLANS, POLICIES AND REGULATIONS

33. The Regional Water 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, as amended by various Regional Water Board resolutions. The Basin Plan designates beneficial uses for surface and groundwater; establishes narrative and numeric water quality objectives that must be attained or maintained to protect the designated (existing and potential) beneficial uses and to conform with the state’s anti-degradation policy; and includes implementation provisions, programs, and policies to protect all waters in the region. In addition, the Basin Plan incorporates all applicable State Water Board and Regional Water Board plans and policies and other pertinent water quality policies and regulations.
34. The Basin Plan incorporates the California Code of Regulations (CCR) Title 22 primary Maximum Contaminant Levels (MCLs) by reference. This incorporation is prospective, including future changes to the incorporated provisions as the changes take effect. The Basin Plan states that ground waters designated for use as domestic or municipal supply (MUN) shall not contain concentrations of chemical constituents and radionuclides in excess of the MCLs. The Basin Plan also specifies that ground waters shall not contain taste or odor-producing substances in concentrations that cause nuisance or adversely affect beneficial uses.
35. The Basin Plan contains water quality objectives for the Central Groundwater Basin, which is the receiving water affected by the injection of recycled water at the Barrier. The beneficial uses of the Central Groundwater Basin are as follows:

Table 1 - Beneficial Uses of Groundwater	
Receiving Water Name	Beneficial Use(s)
Los Angeles Coastal Plain (Central Basin); Department of Water Resources (DWR) Basin No. 4-11.04)	<u>Confined Aquifer</u> Existing Beneficial Uses: Municipal and domestic water supply (MUN); industrial service supply (IND); industrial process supply (PROC); and agricultural supply (AGR).

36. The Sources of Drinking Water Policy (Resolution No. 88-63) provides that all waters of the state, with certain exceptions are to be protected as existing or potential sources of municipal and domestic supply. Exceptions include waters with existing high dissolved solids (i.e., greater than 3,000 mg/L), low sustainable yield (less than 200 gallons per day for a single well), waters with contamination that cannot be treated for domestic use using best management practices or best economically achievable treatment practices, waters within particular municipal, industrial and agricultural wastewater conveyance and holding facilities, and regulated geothermal groundwaters.
37. The mineral water quality objectives for the Central Basin are:

Table 2 - Water Quality Objectives for Groundwater					
DWR Basin No.	Basin	Objectives (mg/L)			
		TDS	Sulfate	Chloride	Boron
4-11.04	Central Basin Confined aquifers	700	250	150	1.0

38. Pursuant to California Water Code (Water Code) section 106.3, it is the policy of the State of California that every human being has the right to safe, clean, affordable, and accessible water adequate for human consumption, cooking and sanitary purposes.
39. Pursuant to Water Code section 13263(g), discharges of waste into waters of the state are privileges, not rights. Nothing in this Order creates a vested right to continue the discharge. Water Code section 13263 authorizes the Regional Water Board to issue waste discharge requirements that implement any relevant water quality control plan.
40. This Order includes limits on quantities, rates, and concentrations of chemical, physical, biological, and other constituents in the advanced treated recycled water that is injected into groundwater.
41. A goal of the Recycled Water Policy (State Water Board Resolution No. 2009-0011) is to increase the beneficial use of recycled water from municipal wastewater sources in a manner consistent with state and federal water quality laws and regulations. The Policy directs the Regional Water Quality Control Boards to collaborate with generators of municipal wastewater and interested parties in the development of salt and nutrient management plans (SNMPs) to manage the loading of salts and nutrients to groundwater basins in a manner that is protective of beneficial uses, thereby supporting the sustainable use of local waters.

A hydrology model was submitted during the development of the draft SNMP to predict the salt and nutrient changes in the Central Basin from all sources, including the use of recycled water for recharge through injection and spreading. The model runs support the use of recycled water while requiring groundwater monitoring to confirm the model predictions.

42. CDPH has established a notification level of 10 nanograms per Liter (ng/L) for NDMA. The notification level is the concentration level of a contaminant in drinking water delivered for human consumption that CDPH has determined, based on available scientific information, does not pose a significant health risk but warrants notification. Notification levels are established as precautionary measures for contaminants that may be considered candidates for establishment of maximum contaminant levels, but have not yet undergone or completed the regulatory standard setting process prescribed for the development of maximum contaminant levels and are not drinking water standards. CDPH has established a response level of 300 ng/L for NDMA. The response level is the concentration of a contaminant in drinking

water delivered for human consumption at which CDPH recommends that additional steps, beyond notification, be taken to reduce public exposure to the contaminant.

43. Section 13267(b) of the Water Code states, in part:

In conducting an investigation specified in subdivision (a), the regional board may require that any person who has discharged, discharges, or is suspected of having discharged or discharging or who proposes to discharge within its region, or any citizen or domiciliary, or political agency or entity of this state who has discharged, discharges, or is suspected of having discharged or discharging, or who proposes to discharge waste outside of its region shall furnish under penalty of perjury, technical or monitoring program reports which the regional board requires. The burden, including costs of these reports shall bear a reasonable relationship to the need for the reports and the benefits to be obtained from the reports. In requiring those reports, the regional board shall provide the person with a written explanation with regard to the need for the reports, and shall identify the evidence that supports requiring that person to provide the reports.

- Section 13267(d) of the Water Code states, in part:

[A] regional board may require any person, including a person subject to waste discharge requirements under section 13263, who is discharging, or who proposes to discharge, wastes or fluid into an injection well, to furnish the state board or regional board with a complete report on the condition and operation of the facility or injection well, or any other information that may be reasonably required to determine whether the injection well could affect the quality of the waters of the state.

44. The need for the technical and monitoring reports required by this Order, including the Monitoring and Reporting Program, are based on the Report of Waste Discharge (ROWD) and Engineering Report; the CDPH Finding of Facts and Conditions; the California Environmental Quality Act (CEQA) Initial Study; and other information in the Regional Water Board's files for the Facility. The technical and monitoring reports are necessary to assure compliance with these waste discharge requirements and water recycling requirements. The burden, including costs, of providing the technical reports required by this Order bears a reasonable relationship to the need for the reports and the benefits to be obtained from the reports.
45. On October 28, 1968, the State Water Board adopted Resolution No. 68-16, *Statement of Policy with Respect to Maintaining High Quality of Waters in California* (Resolution 68-16), establishing an anti-degradation policy for the State Water Board and Regional Water Boards. Resolution No. 68-16 requires that existing high quality waters be maintained unless a change is demonstrated to be consistent with maximum benefit to the people of the State, will not unreasonably affect present and anticipated beneficial uses of waters, and will not result in water quality less than that prescribed in applicable policies. Resolution No. 68-16 also prescribes waste

discharge requirements for discharges to high quality waters that will result in the best practicable treatment or control of the discharge necessary to assure that a pollution or nuisance will not occur and the highest water quality consistent with maximum benefit to the people of the State will be maintained. The Regional Water Board's Basin Plan implements, and incorporates by reference, the state anti-degradation policy.

46. This Order is consistent with Resolution No. 68-16. Groundwater recharge with recycled water for later extraction and use in accordance with the Recycled Water Policy, and state and federal water quality laws, is to the benefit of the people of the state of California. Nonetheless, groundwater recharge projects using recycled water have the potential to lower water quality within a basin. The Regional Water Board finds that, based on available information and monitoring data, any change in the existing high quality of the groundwater basin as a result of groundwater recharge allowed by this Order will be consistent with maximum benefit to the people of the State, will not unreasonably affect beneficial uses, and will not cause exceedance of applicable water quality standards for the basin. As described in the findings herein, the Project Sponsors are implementing the best practicable treatment or control of the recycled water to be injected into the basin for groundwater recharge. Compliance with this Order will protect present and anticipated beneficial uses of the groundwater, ensure attainment of water quality prescribed in applicable policies, and avoid any conditions of pollution or nuisance.

VIII. CEQA AND NOTIFICATION

47. The Project Sponsors prepared an Initial Study for a proposed project to inject 100 percent recycled water into the Alamitos Barrier, with WRD serving as the lead agency. Based on the Initial Study, WRD determined that the proposed project would not have a significant impact on the environment. On March 9, 2012, WRD issued a revised Notice of Intent to adopt a Negative Declaration for the proposed project. The Notice of Intent was posted on the WRD website and in the Long Beach Press Telegram, with mailings to interested parties, and circulation through the State Clearinghouse (#20120205) and the Los Angeles County Clerk's Office. The 30 day public review process ended on April 9, 2012. WRD received and responded to four comments, none of which necessitated changes in the Negative Declaration. The Negative Declaration was adopted by the WRD Board of Directors on April 20, 2012, and the project was approved by the WRD Board of Directors on May 4, 2012. The Negative Declaration was filed with the State Clearinghouse on May 7, 2012. No further comments or objections were received during the subsequent 30 days. An addendum to the Negative Declaration was approved by the WRD Board of Directors on May 14, 2013. The Project has completed the notification and review process required by CEQA. The Regional Water Board is a responsible agency for purposes of CEQA. The Regional Water Board has considered the Initial Study, which did not identify significant environmental effects with respect to water quality.
48. Any person aggrieved by this action may petition the State Water Resources Control Board (State Water Board) to review the action in accordance with Water Code section 13320 and California Code of Regulations, Title 23, section 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days

after the date of this Order, except that if the thirtieth day following the date of this Order falls on a Saturday, Sunday, or state holiday, the petition must be received by the State Water Board by 5:00 p.m. on the next business day. Copies of the law and regulations applicable to filing petitions may be found on the internet at: http://waterboards.ca.gov/public_notices/petitions/water_quality
Or will be provided upon request.

49. The Regional Water Board has notified the Project Sponsors and interested agencies and persons of its intent to issue this Order for the production and use of recycled water and has provided them with an opportunity to submit written comments. The Regional Water Board, in a public meeting, heard and considered all comments pertaining to these WDRs/WRRs.

THEREFORE, IT IS HEREBY ORDERED that Order No. R4-2005-0061, as amended, with MRP No. CI-8956, is rescinded upon the effective date of this Order except for enforcement purposes, and, in order to meet the provisions contained in division 7 of the Water Code (commencing with section 13000) and regulations and guidelines adopted thereunder, and California Code of Regulations Title 22, division 4, chapter 3, the Project Sponsors shall comply with the requirements in this Order. This action in no way prevents the Los Angeles Regional Water Board from taking enforcement action for past violations of the previous Order.

I. INFLUENT SPECIFICATIONS

The influent to the Vander Lans WTF shall be tertiary treated effluent as described in the approved 2013 Title 22 Engineering Report and shall at all times be adequately oxidized.

II. RECYCLED WATER TREATMENT SPECIFICATION

As of October 1, 2014, treatment of the recycled water shall be as described in the Findings of this Order and the CDPH Findings of Fact and Conditions issued by CDPH.

III. RECYCLED WATER DISCHARGE LIMITS

1. The advanced treated recycled water shall not contain constituents in excess of the following limits:

Constituents	Units	Concentration	Monitoring Frequency	Compliance Interval
TDS	mg/L	700	Quarterly	Running annual average
Chloride	mg/L	150	Quarterly	Running annual average
Sulfate	mg/L	250	Quarterly	Running annual average
Boron	mg/L	1.0	Quarterly	Running annual average

Total Nitrogen ²	mg/L	10	Weekly grab or 24 hour composite	Sample result: no averaging
Nitrate plus Nitrite as N	mg/L	10	Weekly grab or 24 hour composite	Sample result: no averaging
Nitrate as N	mg/L	10	Weekly grab or 24 hour composite	Sample result: no averaging
Nitrite as N	mg/L	1	Weekly grab or 24 hour composite	Sample result: no averaging
Total Coliform	MPN/100 mL	1.1	Daily grab	Weekly maximum

2. Compliance with the recycled water discharge specifications shall be determined after the injection point for sodium hypochlorite and before injection into the Barrier.

IV. GENERAL REQUIREMENTS

1. Recycled water shall not be used for direct human consumption or for the processing of food or drink intended for human consumption.
2. Bypass, discharge, or delivery to the use area of inadequately treated recycled water, at any time, is prohibited.
3. The Facility and injection wells shall be adequately protected from inundation and damage by storm flows.
4. Recycled water use or disposal shall not result in earth movement in geologically unstable areas.
5. Odors of sewage origin shall not be perceivable at any time outside the boundary of the Facility.
6. The Project Sponsors shall, at all times, properly operate and maintain all treatment facilities and control systems (and related appurtenances) which are installed or used by the Project Sponsors to achieve compliance with the 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).
7. A copy of these requirements shall be maintained at the Facility so as to be available at all times to operating personnel.
8. Supervisors and operators of this advanced water treatment plant shall possess a certificate of appropriate grade as specified in CCR Title 23, Division 3, Chapter 26.
9. For any material change or proposed change in character, location, or volume of recycled water, or its uses, the Project Sponsors shall submit at least 120 days prior

² Total nitrogen shall be defined as the sum of ammonia, nitrite, nitrate, and organic nitrogen concentrations, expressed as nitrogen. The Project Sponsors shall collect each week, one grab or 24-hour composite sample of the recycled water for total nitrogen, nitrite plus nitrate as nitrogen, nitrate and nitrite.

to the proposed change an engineering report or addendum to the existing engineering report to the Regional Water Board and CDPH (pursuant to Water Code Division 7, Chapter 7, Article 4, section 13522.5 and CCR Title 22, Division 4, Chapter 3, Article 7, section 60323) for approval. The Engineering Report shall be prepared by a qualified engineer registered in California.

V. ADDITIONAL PROVISIONS

1. Injection of the advanced treated recycled water shall not cause or contribute to an exceedance of water quality objectives in the Central Basin.
2. Groundwater Well Replacement: Replacement or addition of injection wells to the Alamitos Barrier Recycled Water Project will not require a report of material change, filing of a new Report of Waste Discharge, or submitting an updated Engineering Report, provided
 - a. the additional injection capacity does not violate any requirement in this Order;
 - b. at least 30 days prior to installation of an additional well, the Project Sponsors submit, in writing, the purpose, design, and location of the well to CDPH and the Regional Water Board;
 - c. the Regional Water Board, in consultation with CDPH, approves the location of the additional well;³ and
 - d. within 90 days after the installation or replacement of the well, the Project Sponsor submit, in writing, the complete geologic and electrical logs and as-built construction diagrams of the injection wells to CDPH and the Regional Water Board.
3. The Project Sponsors shall submit to the Regional Water Board, under penalty of perjury, self-monitoring reports according to the specifications contained in the MRP, as directed by the Executive Officer and signed by a designated responsible party.
4. The Project Sponsors shall notify this Regional Water Board and CDPH by telephone or electronic means within 24 hours of knowledge of any violations of this Order or any adverse conditions as a result of the use of recycled water from this facility; written confirmation shall follow within 5 working days from date of notification. The report shall include, but not be limited to, the following information, as appropriate:
 - a. The nature and extent of the violation;
 - b. The date and time when the violation started, when compliance was achieved, and when injection was suspended and restored, as applicable;
 - c. The duration of the violation;

³ If the Regional Water Board fails to approve or deny the proposed construction within thirty days of receipt of the proposal, the proposal shall be deemed approved. The new OCWD wells described in the CDPH Findings of Fact are exempt from this requirement.

- d. The cause(s) of the violation;
 - e. Any corrective and/or remedial actions that have been taken and/or will be taken with a time schedule for implementation to prevent future violations; and,
 - f. Any impact of the violation.
5. This Order does not exempt the Project Sponsors from compliance with any other laws, regulations, or ordinances which may be applicable; it does not legalize the recycling and use facilities; and it leaves unaffected any further constraint on the use of recycled water at certain site(s) that may be contained in other statutes or required by other agencies.
 6. 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 compliance with this Order; nor does this Order prevent imposition of additional standards, requirements, or conditions by any other regulatory agency.
 7. This Order may be modified, revoked and reissued, or terminated for cause, including but not limited to, failure to comply with any condition in this Order; endangerment of human health or environment resulting from the permitted activities in this Order; obtaining this Order by misrepresentation or failure to disclose all relevant facts; or, acquisition of new information that could have justified the application of different conditions if known at the time of Order adoption. The filing of a request by the Project Sponsors for modification, revocation and reissuance, or termination of the Order or a notification of planned changes or anticipated noncompliance does not stay any condition of this Order.
 8. The Project Sponsors shall furnish, within a reasonable time, any information the Regional Water Board or CDPH may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this Order. The Project Sponsors shall also furnish the Regional Water Board, upon request, with copies of records required to be kept under this Order for at least three years.
 9. In an enforcement action, it shall not be a defense for the Project Sponsors 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 Project Sponsors 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.
 10. This Order includes the attached *Standard Provisions Applicable to Waste Discharge Requirements*. If there is any conflict between the provisions stated in this Order and the Standard Provisions, the provisions stated in this Order shall prevail.

11. This Order includes the attached MRP No. CI-8956. If there is any conflict between provisions stated in the MRP and the Standard Provisions, those provisions stated in the MRP prevail.
12. The CDPH Conditions that are not explicitly included in this Order are incorporated herein by this reference, and are enforceable requirements of this Order. Any violation of a term in this Order, that is identical to a CDPH Condition, will constitute a single violation.

VI. REOPENER

1. This Order may be reopened to include the most scientifically relevant and appropriate limitations for this discharge, including a revised Basin Plan limit based on monitoring results, anti-degradation studies, or other Regional Water Board or State Water Board policy, or the application of an attenuation factor based upon an approved site-specific attenuation study.
2. The WDRs/WRRs may be reopened to modify limitations for constituents to protect beneficial uses, based on new information not available at the time this Order was adopted.
3. Upon completion and adoption of the Salt and Nutrient Management Plan (SNMP), or after additional monitoring, reporting and trend analysis documenting aquifer conditions, this Order may be reopened to ensure the groundwater is protected in a manner consistent with state and federal water quality laws, policies and regulations.
4. This Order may be reopened to incorporate any new regulatory requirements for sources of drinking water or injection of recycled water for groundwater recharge to aquifers that are used as a source of drinking water, that are adopted after the effective date of this Order, including the CDPH Groundwater Replenishment Regulations to be adopted by June 30, 2014.
5. This Order may be reopened upon a determination by CDPH that treatment and disinfection of the Vander Lans WTF recycled water is not sufficient to protect human health.

VII. ENFORCEMENT

The requirements of this Order are subject to enforcement under Water Code sections 13261, 13263, 13264, 13265, 13268, 13350, 13300, 13301, 13304, 13350, and enforcement provisions in Water Code, Division 7, Chapter 7 (Water Reclamation).

VIII. EFFECTIVE DATE OF THE ORDER

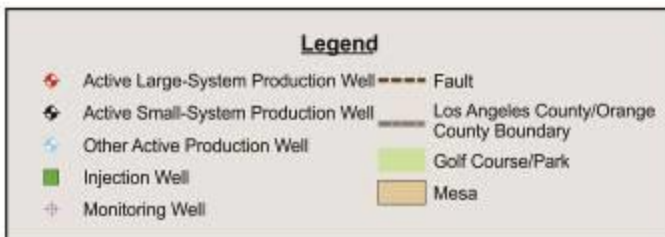
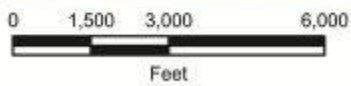
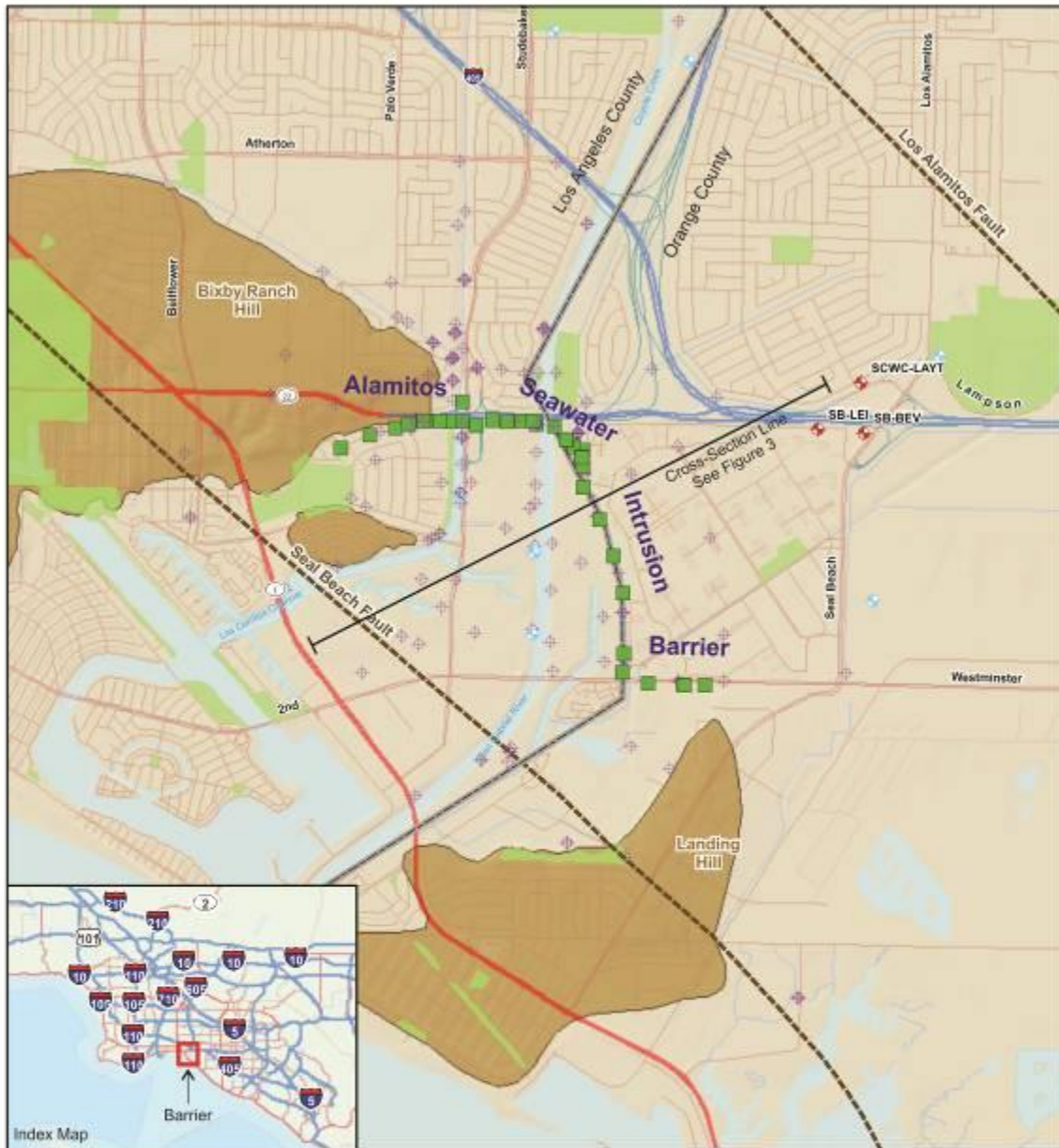
This Order takes effect on October 1, 2014

I, Samuel Unger, Executive Officer, do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the Regional Water Board, Los Angeles Region on June 12, 2014.

Samuel Unger, P.E.
Executive Officer

REVISED TENTATIVE

FIGURE 1 – LOCATION OF ALAMITOS BARRIER RECYCLED WATER PROJECT



Alamitos Barrier location map.
 Alamitos Barrier Modeling Project

FIGURE 2- CROSS SECTION OF WELL INJECTION FIELD

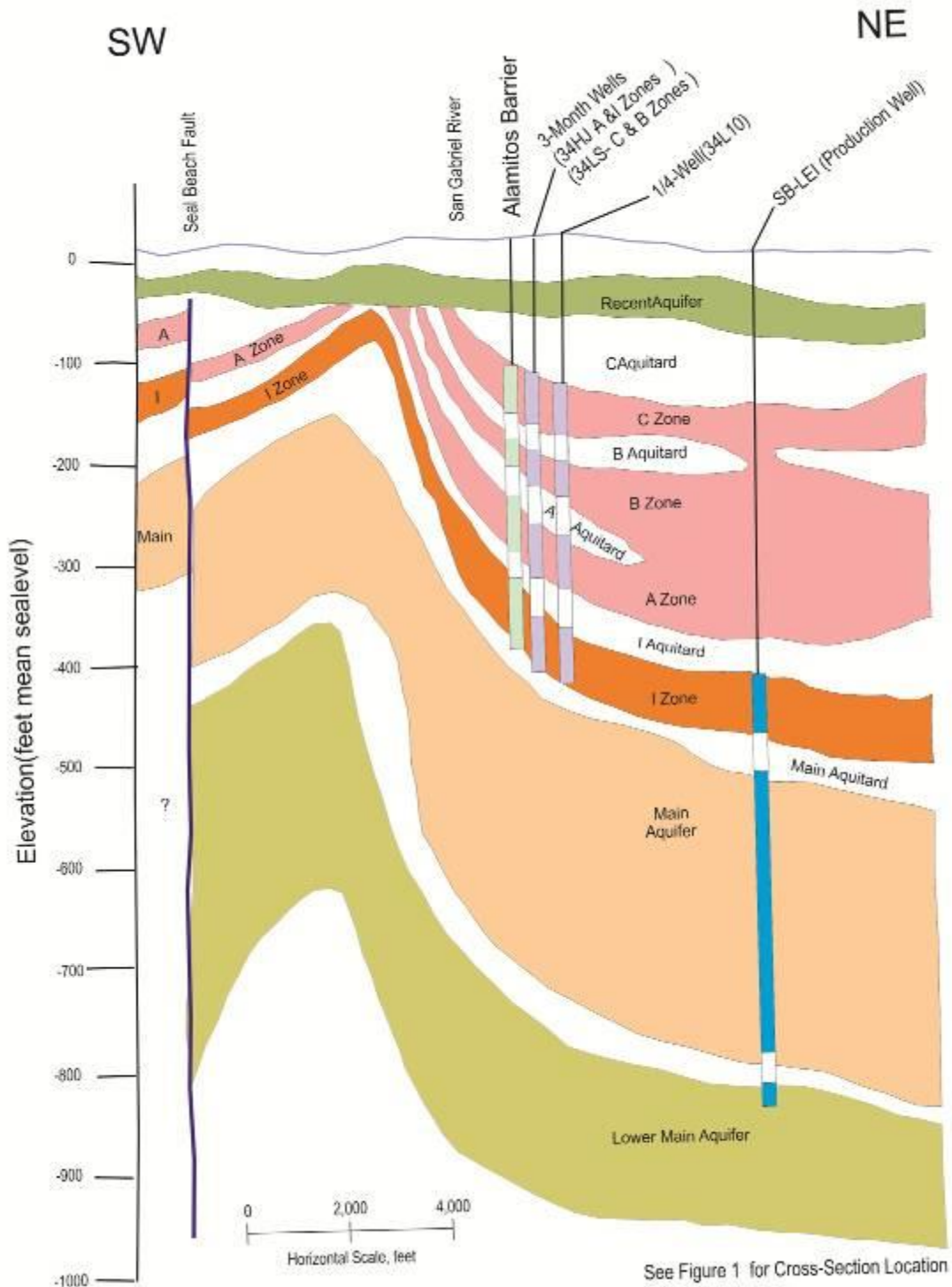


FIGURE 3 – Leo J. Vander Lans Water Treatment Facility



FIGURE 4- PROCESS FLOW DIAGRAM

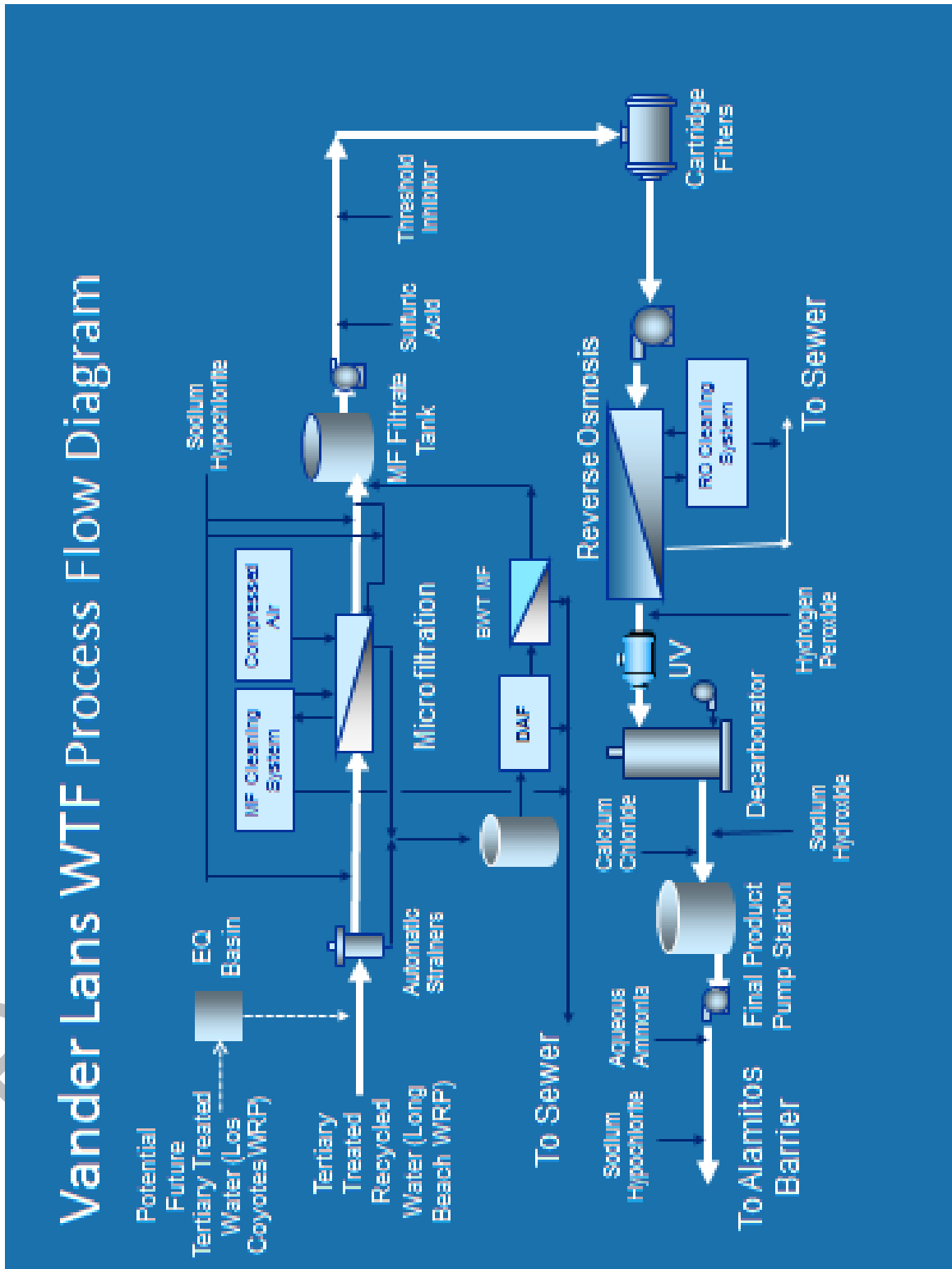


FIGURE 6 – PREDICTED RECYCLED WATER CONCENTRATIONS IN AQUIFERS AT NEAREST DRINKING WATER WELL WITH 100% RECYCLED WATER INJECTION

