Attachment A to Resolution No. R15-001

Amendment to the Water Quality Control Plan for the Los Angeles Region to Incorporate Groundwater Quality Management Measures for Salts and Nutrients in the Central Basin and West Coast Basin

Chapter 8:
Groundwater Quality Management
Sustainability and Basin-specific Protection of Groundwater

Table of Contents

Introduction

Groundwater is a valuable resource in the Los Angeles Region, and is relied upon for a significant portion of municipal and domestic water supply and for agricultural, industrial and process water. The groundwater basins and sub-basins in the Los Angeles Region and their designated beneficial uses are identified in Chapter 2 of this Basin Plan. The water quality objectives to protect each of the beneficial uses are set forth in Chapter 3. The Regional Water Board programs of implementation to achieve the water quality objectives are set forth in Chapter 4.

While the regulation and oversight of the distribution of water, i.e., establishing and regulating groundwater supply, is not within the purview of the Regional Water Board, the growing focus toward promoting sustainable local water supplies further highlights the need for increased oversight to ensure water supplies of sufficient quality to support existing beneficial uses within a basin, as well as the need to protect high quality waters for future use. Thus, groundwater quality regulation and protection is conducted using a basin-wide approach that considers issues pertaining to both water quality and water supply. A leading example of this is the State Water Resources Control Board's (State Water Board's) Policy for water Quality Control For Recycled Water (Recycled Water Policy or Policy) (see Chapter 5), which promotes the increased development of recycled water projects to supplement demand, but also recognizes the potential impact of such activities on groundwater quality. The Recycled Water Policy addresses potential impacts by requiring salt and nutrient management planning.

This chapter focuses on basin/sub-basin groundwater quality management, commencing with salt and nutrient management plans.

I. Salt and Nutrient Management Plans

A. Legal Basis and Authority

The purpose of the Recycled Water Policy is to increase the use of recycled water from municipal wastewater sources that meet the definition in Water Code section 13050(n), in a manner that implements State and federal water quality laws. This policy is consistent with the State Water Board's overarching goal of promoting sustainable water supplies. The policy is also intended to encourage beneficial reuse, rather than solely disposal, of municipal wastewater.

The Policy (which is summarized in Chapter 5) recognizes the potential for increased salt and nutrient loading to groundwater basins as a result of increased recycled water use and, therefore, requires the development of regional or sub-regional salt and nutrient management plans (SNMPs) for each groundwater basin in the State. The Policy also acknowledges that recycled water may not be the sole cause of high concentrations of salts and nutrients in

groundwater basins, and therefore regulation of recycled water alone may not always address such conditions. The intent of SNMPs is for salts and nutrients from all sources to be managed on a basin-wide or watershed-wide basis in a manner that ensures the attainment of water quality objectives and protection of beneficial uses.

Per the Policy, these SNMPs are to be directed and funded by local water and wastewater entities, together with local salt/nutrient contributing stakeholders, and developed through a collaborative process open to all stakeholders including the Regional Water Board .

The Policy also directs that within one year of receipt of a Salt and Nutrient Management Plan, the Regional Water Board shall consider it for incorporation into the Basin Plan, revised implementation programs, consistent with Water Code section 13242, for those groundwater basins within its region where water quality objectives for salts or nutrients are being exceeded, or where conditions are such that there is the threat that water quality objectives will be exceeded. The implementation program(s) shall be based on the salt and nutrient management plans required by the Recycled Water Policy.

B. Elements of a Salt and Nutrient Management Plan

The **required elements of a SNMP**, as specified by the Recycled Water Policy include:

a) Source identification/source loading and assimilative capacity estimates;
b) Implementation measures that integrate water quantity and quality, groundwater and surface water, and recharge area protection in order to maintain a sustainable long-term supply of water where salt and nutrient loadings are managed for multiple beneficial uses;
c) Consideration of water recycling/stormwater recharge/use;
d) Anti-degradation analyses demonstrating that the projects included within the plan will collectively, satisfy the requirements of State Water Board's Resolution No. 68-16, "Statement of Policy with respect to Maintaining High Quality of Waters in California";
e) Development of a basin-wide monitoring plan to provide to provide reasonable, cost-effective means of determining whether groundwater quality objectives for salts, nutrients and other constituents of concern as identified in the SNMP are being achieved.; and
f) Annual monitoring of Constituents of Emerging Concern (CECs) including several types of chemicals that may be classified as (i) persistent organic pollutants, (ii) pharmaceuticals and personal care products, (iii) veterinary medicines, (iv) endocrine disruptors, and (v) others.

C. CEQA Requirements

The Policy requires that salt and nutrient management plans developed for basin/sub-basins comply with the California Environmental Quality Act (CEQA), Cal Pub. Res. Code §§ 21000 et

seq. and associated regulations set forth in California Code of Regulations, Title 14 §§ 15000 et seq. CEQA requires state and local agencies to evaluate the potentially significant environmental impacts of proposed projects and identify measures to avoid or mitigate these impacts where feasible. Pursuant to Public Resources Code section 21080.5, the Resources Agency has approved the Regional Boards' basin planning process as a "certified regulatory program" that adequately satisfies the CEQA requirements for preparing environmental documents (14 Cal. Code Regs. § 15251(g); 23 Cal. Code Regs. § 3782). A programmatic substitute environmental document (SED) has been prepared and considered by the Regional Water Board for each of the implementation programs below. SNMP proponents may also be required to comply with other CEQA requirements related to specific projects for salt and nutrient management contained in their plans.

D. Organization of Section

As Salt and Nutrient Management Plans are developed for the different basin/sub-basin groups, this Chapter will be amended to include summaries of the salt and nutrient management measures contained in each SNMP in chronological order of Board approval.

II. Basin-Specific Salt and Nutrient Management Plans

A. Central Basin and West Coast Basin

Adopted by the California Regional Water Quality Control Board, Los Angeles Region on February 12, 2015.

Approved by:

The State Water Resources Control Board on [Insert Date].
The Office of Administrative Law on [Insert Date].

The program of implementation[1] described below is based on the Salt and Nutrient Management Plan for the Central Basin and West Coast Basin developed by the Water Replenishment District of Southern California (WRD) and other agencies, including, Los Angeles County Department of Public Works, West Basin Municipal Water District, Los Angeles Department of Water and Power, and the County Sanitation Districts of Los Angeles County. The Salt and Nutrient Management Plan and this program of implementation satisfy the Recycled Water Policy requirements for Salt and Nutrient Management Plans. This program of implementation applies to groundwater basin(s) with the designated beneficial use of municipal and domestic supply (MUN).

The following summarizes essential elements of the Salt and Nutrient Management Plan for the Central Basin and West Coast Basin. Further details may be found in the full document at: http://www.waterboards.ca.gov/losangeles/water_issues/programs/salt_and_nutrient_management/index.shtml

Background

The Central Basin and West Coast Basin are located in the southern portion of Los Angeles County and provide approximately 40 percent of the overall water supply for the nearly four million residents and businesses in the 43 cities overlying the basins. The Central Basin covers approximately 280 square miles and is hydrogeologically divided into four subareas including the Los Angeles Forebay, Montebello Forebay, Whittier Area, and Pressure Area (Figure 8.1-1). The forebays are areas where confining layers are thin or absent and infiltration of precipitation

[1] The Recycled Water Policy refers to "revised implementation plans" for adoption into regional basin plans pursuant to Water Code section 13242. Water Code section 13242 uses the term "program of implementation." Pursuant to Water Code section 13242, "[t]he program of implementation for achieving water quality objectives shall include, but not be limited to:
(a) A description of the nature of actions which are necessary to achieve the objectives, including recommendations for appropriate action by any entity, public or private.
(b) A time schedule for the actions to be taken.
(c) A description of surveillance to be undertaken to determine compliance with objectives."

and surface water can recharge deeper potable water supply aquifers. The Montebello Forebay is the most significant area of recharge in the Central Basin. The Central Basin Pressure Area, the largest of the four subareas, is characterized by aquifers that are generally confined by relatively impermeable clay layers over most of the area, but areas of semi-permeable confining layers allow some interaction between the aquifers (DWR, 1961). The West Coast Basin covers approximately 140 square miles. Aquifers in the West Coast Basin are generally confined and receive the majority of their natural recharge from adjacent groundwater basins or from the Pacific Ocean (seawater intrusion). The Newport-Inglewood Uplift and associated faulting acts as a partial barrier to groundwater flow between the Central Basin and West Coast Basin.

Basin Adjudications and Management

From 1900 through the 1950s, overpumping of the basins caused declines in groundwater levels, seawater intrusion, and other groundwater management problems related to supply and quality. To remedy these problems, the courts adjudicated the two basins in the early 1960s and set a limit on allowable groundwater production. The adjudicated pumping amounts are greater than the natural replenishment of the groundwater aquifers, creating an annual deficit or annual overdraft, under natural recharge conditions. Accordingly, the WRD was established in 1959 to provide the needed supplemental replenishment water to make up the difference between the adjudicated amounts and the natural safe yield. Since then multiple measures have been implemented to manage groundwater supply and quality and prevent seawater intrusion, as described below.

TABLE 8.1-1: HISTORICAL BASIN MANAGEMENT MEASURES

Management Measure	Function
Montebello Forebay Spreading Grounds (MFSG)	To provide artificial groundwater recharge. Water is comprised of stormwater (since 1930s), imported water (since 1950s), and recycled water (since 1960s).
West Coast Basin Seawater Intrusion Barrier (WCBB)	To create a pressure ridge or subsurface water wall to block further seawater intrusion through a series of injection wells constructed by Los Angeles County (LAC) along the western coast of the West Coast Basin in the 1950s
Dominguez Gap Seawater Intrusion Barrier (DGB)	To create a pressure ridge or subsurface water wall to block further seawater intrusion through a series of injection wells constructed by Los Angeles County (LAC) along the southern coast of the West Coast Basin in the 1970s. Currently, treated imported water and advanced treated recycled water are injected.
Alamitos Gap Seawater Intrusion Barrier (AGB)	To create a pressure ridge or subsurface water wall to block further seawater intrusion through a series of injection wells constructed by Los Angeles County (LAC) along the southern coast of the Central Basin in the 1960s. Currently, treated

Management Measure	Function
	imported water and advanced treated recycled water are injected.
De-salters	For salinity management in the West Coast Basin, the Brewer De-salter and Goldsworthy De-salter began operating in 1993 and 2002, respectively, to pump and treat brackish groundwater for potable supply.

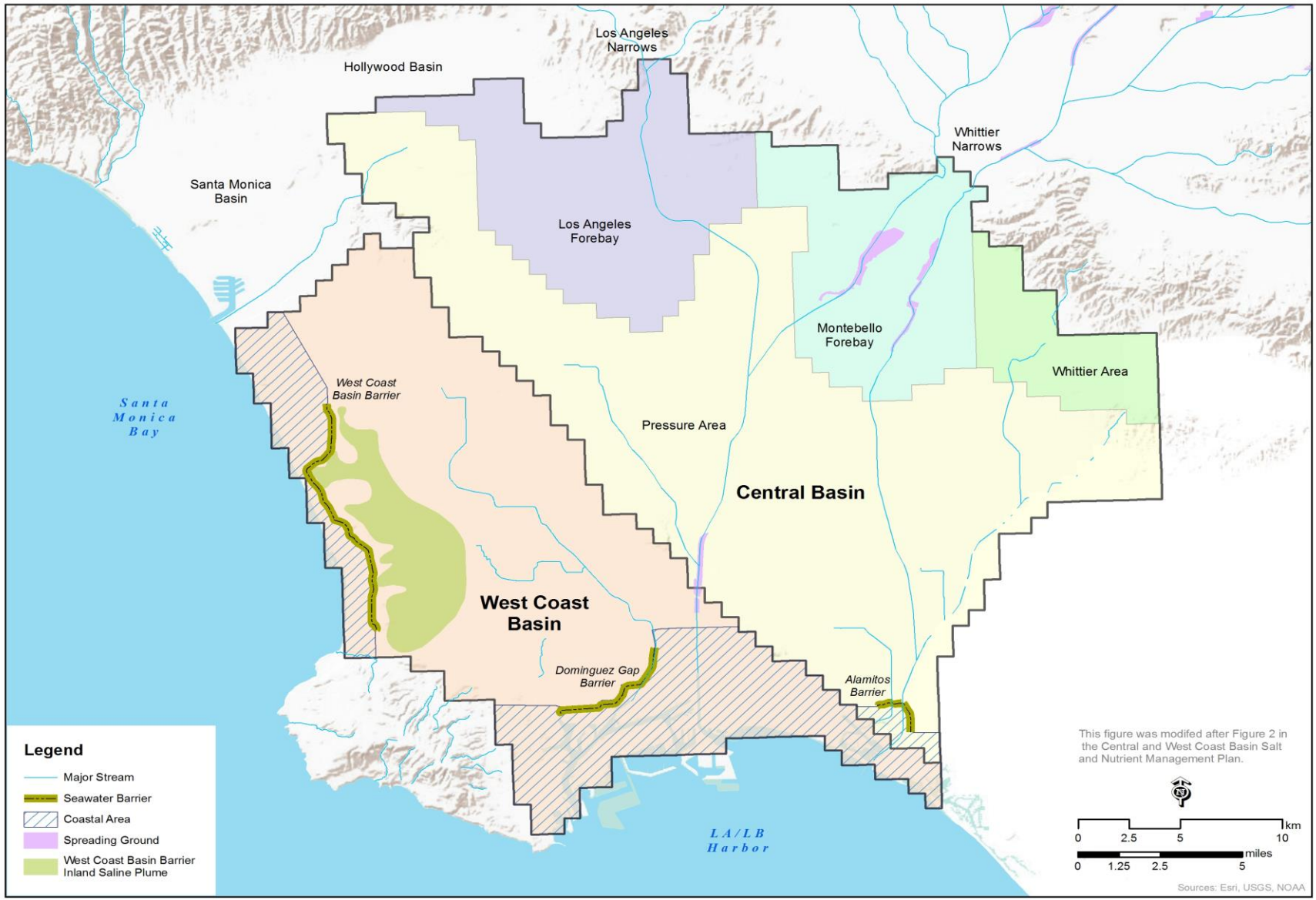

Figure 8.1-1. Central Basin and West Coast Basin Subareas and Coastal Areas (modeled).

Participating Agencies

Stakeholders in the Central Basin and West Coast Basin that participated in the SNMP process and collaborated to develop the SNMP include water and wastewater entities, regulatory agencies, water purveyors, water associations, and environmental groups. The WRD was the lead agency managing and coordinating development of the SNMP. Funding partners for the SNMP consist of WRD, Los Angeles County Department of Public Works, West Basin Municipal Water District, Los Angeles Department of Water and Power, and the County Sanitation Districts of Los Angeles County (CSDLAC).

Sources of Water in the CBWCB

Sources of water for use and recharge in the CBWCB include surface water/stormwater, imported water, groundwater, and recycled water. Other minor potential sources of groundwater recharge include leaking pipes, septic systems, and stream losses (not associated with managed aquifer recharge).

TABLE 8.1-2: CONTRIBUTIONS OF SOURCE WATERS TO THE CENTRAL AND WEST COAST BASINS

TYPE	SOURCE	CONTRIBUTION TO GROUNDWATER
Surface water	Los Angeles River	Negligible - lined throughout most of the overlying area
	Rio Hondo	Negligible - lined throughout the overlying area
	San Gabriel River	In-stream recharge along the San Gabriel River in the Montebello Forebay, and at the Dominguez Gap Spreading Grounds
Storm water	Precipitation from overlying area	Active capture and recharge through replenishment operations the MFSG, as well as stormwater retention basins and LID projects in the area
Imported water	Colorado River (CR) and State Water Project (SWP)	Applied to the Montebello Forebay spreading grounds (Untreated imported water) Injection into the three seawater intrusion barriers (Treated Imported Water)
	Owens Valley-Mono Basin	Water supply in the CBWCB
	Groundwater extracted from the San Gabriel Basin	Water supply in the CBWCB
Groundwater	Extracted from the CBWCB	Water supply and irrigation (small percentage)
	Subsurface flow from adjacent groundwater basins and minor ocean water inflow	Recharge of the CBWCB

TYPE	SOURCE	CONTRIBUTION TO GROUNDWATER
Recycled Water	Pomona, San Jose Creek, and Whittier Narrows Water Reclamation Plants (WRPs)	Managed Aquifer Recharge in the Montebello Forebay
	Tertiary-treated recycled water from CSDLAC's Long Beach, Los Coyotes, and San Jose Creek WRPs	Irrigation and commercial/industrial applications in the Central Basin
	Advanced Water Treatment (AWT) recycled water produced by the Leo J. Vander Lans Advanced Water Treatment Facility	Injected at the AGB
	Tertiary treated and AWT recycled water from Edward C. Little Water Recycling Facility (WRF) .	Irrigation (tertiary-treated) in the West Coast Basin Injection (AWT) at the WCBB
	AWT recycled water from Terminal Island Water Reclamation Plant/Advanced Water Purification Facility (TIWRP)	Injection at the DGB

Groundwater outflow from the Central Basin and West Coast Basin includes:

- Pumping, including extraction associated with the de-salters,
- Subsurface outflow to adjacent basins and the ocean, and
- Groundwater discharge to surface water.

Salt and Nutrient Loading to the Central Basin and West Coast Basin

The mass balances (inputs and outflows) for total dissolved solids (TDS), chloride, and nitrate-N for a 10-year baseline period (Water Years 2000-01 to 2009-10) are presented below.

TABLE 8.1-3A: SALT AND NUTRIENT BALANCE IN THE CENTRAL BASIN (2000-01 THROUGH 2009-10)

Source Water	TDS		Chloride		Nitrate	
	(tons)	%	(tons)	%	(tons)	%
Spreading Grounds	65,880	48.9	13,125	57.2	307.6	73.4
Seawater Barrier	2,227	1.7	447	1.9	4.8	1.2
Precipitation Infiltration	3,429	2.5	457	2.0	3.8	0.9
Mountain Front Recharge	2,191	1.6	314	1.4	13.6	3.2
Irrigation Return Flows	31,643	23.5	4,601	20.0	4.9	1.2
Subsurface Inflow	29,478	21.9	4,012	17.5	84.2	20.1
Total Inflow	**134,849**	**100**	**22,956**	**100**	**419.0**	**100**
Groundwater Production	-130,042	97.3	-19,787	96.9	-110.3	99.1
Subsurface Outflow	-3,621	2.7	-537	3.1	-0.9	0.8
Total Outflow	**-133,663**	**100**	**-17,323**	**100**	**-111.3**	**100**
Annual Change in Mass	**1,186**	**-**	**5,633**	**-**	**307.7**	**-**

TABLE 8.1-3B: SALT AND NUTRIENT BALANCE IN THE WEST COAST BASIN (2000-01 THROUGH 2009-10)

Source Water	TDS		Chloride		Nitrate	
	(tons)	%	(tons)	%	(tons)	%
Spreading Grounds	127	0.3	17	0.1	0.8	2.2
Seawater Barriers	8,830	17.6	1,977	10.4	15.3	42.6
Precipitation Infiltration	1,689	3.4	225	1.2	1.9	5.3
Mountain Front Recharge	804	1.6	115	0.6	5.0	13.9
Irrigation Return Flows	12,716	25.4	3,179	16.6	2.2	6.1
Subsurface Inflow*	25,924	51.8	13,586	71.1	10.7	29.8
Total Inflow	**50,090**	**100**	**19,099**	**100**	**35.9**	**100**
Groundwater Production	-57,937	100	-28,999	100	-4.0	100
Subsurface Outflow	0	0	0	0	0.0	0
Total Outflow	**-57,937**	**100**	**-28,999**	**100**	**-4.0**	**100**
Annual Change in Mass	**-7,847**	**-**	**-9,900**	**-**	**31.9**	**-**

Groundwater Quality and Assimilative Capacity in Central Basin and West Coast Basin

Monitoring data from wells in the Central Basin and West Coast Basin, from January 2007 through mid-2012, were used to calculate current groundwater quality. The water quality data set includes semi-annual monitoring of the network of WRD nested wells and other data sets such as the State Water Board's Division of Drinking Water (formerly the California Department of Public Health) well database. For each basin, two average concentrations were calculated: one average includes the coastal areas (i.e., areas seaward of the barriers) and the other average excludes these coastal areas). For the West Coast Basin, a third average groundwater quality estimate was calculated excluding the WCBB-inland saline plume and coastal areas in order to evaluate the impact of this saline plume on overall basin groundwater quality (Figure 8.1-4a).

TABLE 8.1-4A: GROUNDWATER QUALITY IN THE CENTRAL AND WEST COAST BASINS (2007-2012)

	Existing Average Concentration (mg/l)		
Location	**TDS**	**Cl**	**NO3-N**
Central Basin Water Quality Objectives	**700**	**150**	**10**
Los Angeles Forebay	640	81	0.15
Montebello Forebay	534	88	1.13
Whittier Area	1007	121	0.57
Central Basin Pressure Area (including Coastal Area)	485	65	0.10
Central Basin Pressure Area (excluding Coastal Area)	470	55	0.10
Central Basin (including Coastal Area)	538	73	0.28
Central Basin (excluding Coastal Area)	529	67	0.28
West Coast Basin Water Quality Objectives	**800**	**250**	**10**
West Coast Basin (including Coastal Areas)	1424	660	0.04
West Coast Basin (excluding Coastal Areas)	890	306	0.05
West Coast Basin (excluding Coastal Areas and inland saline plume)	747	224	0.05

The average (2007-2012) TDS, chloride, and nitrate-N concentrations for each subarea/layer and for the Central Basin and West Coast Basin both with and without the coastal areas, and the West Coast Basin without the coastal areas and without the WCBB inland saline plume were compared to the applicable basin water quality objectives to determine the existing available assimilative capacity (Table 8-1.4b).

TABLE 8.1-4B: GROUNDWATER ASSIMILATIVE CAPACITY FOR TDS, CHLORIDES AND NITRATES IN THE CENTRAL AND WEST COAST BASINS (2007-2012)

	Assimilative Capacity (mg/l)		
Location	**TDS**	**Cl**	**NO3-N**
Central Basin Water Quality Objectives	**700**	**150**	**10**
Los Angeles Forebay	60	69	9.85

Location	Assimilative Capacity (mg/l)		
	TDS	**Cl**	**NO3-N**
Montebello Forebay	166	62	8.87
Whittier Area	-307	29	9.43
Central Basin Pressure Area (including Coastal Area)	215	85	9.90
Central Basin Pressure Area (excluding Coastal Area)	230	95	9.90
Central Basin (including Coastal Area)	162	77	9.72
Central Basin (excluding Coastal Area)	171	83	9.72
West Coast Basin Water Quality Objectives	**800**	**250**	**10**
West Coast Basin (including Coastal Areas)	-624	-410	9.96
West Coast Basin (excluding Coastal Area)s	-90	-56	9.95
West Coast Basin (excluding Coastal Areas and inland saline plume)	53	26	9.95

Salt and Nutrient Management Measures in the Central and West Coast Basins

Existing salt and nutrient management measures in the Central Basin and West Coast Basin can be broadly categorized into actions that improve source waters to the groundwater basin, improve stormwater capture, and/or increase recycled water use (Table 8.1-5a).

TABLE 8.1-5A: CURRENT SALT AND NUTRIENT MANAGEMENT MEASURES IN THE CENTRAL AND WEST COAST BASINS

Type	Components
Improve Surface Water Quality	Compliance with TMDL requirements, stormwater best management practices, Low Impact Development, water quality monitoring, education & outreach
Improve Imported Water Quality	Salinity Source Water Control Program (Metropolitan Water District of Southern California), Education & Outreach (Southern California Salinity Coalition), water quality monitoring
Improve Recycled Water Quality	Nitrogen treatment, industrial source controls, water quality monitoring, public education on water softeners, compliance with existing permits and regulations
Improve Groundwater Quality	Seawater intrusion barriers, Desalters, LA County First Flush Policy, water quality monitoring, basin adjudication
Improve Surface Water Capture	Montebello Forebay Spreading Grounds (MFSG), Dominguez Gap Spreading Grounds (DGSG), Torrance stormwater retention ponds
Increased Recycled Water Use	Advanced treated recycled water at seawater barriers, recycled water at MFSG, recycled water for irrigation and industrial uses

Planned implementation projects include increased groundwater recharge at the seawater barriers, increased volumes of groundwater treatment by de-salters, and increased stormwater recharge (Table 8.1-5b). These projects are expected to be completed by the 2025.

TABLE 8.1-5B: MAJOR PLANNED (FUTURE) SALT AND NUTRIENT PROJECTS AND MANAGEMENT STRATEGIES

Project Description*	Estimated Date	Lead Agency(s)
Central Basin		
100% Advanced treated (AWT) Recycled Water (RW) at Alamitos Gap Barrier - increased recharge volume, increased injection volumes and replacement of imported water with advanced treated recycled water	2014/15	Water Replenishment District of Southern California
Groundwater Reliability Improvement Program (GRIP) for the Montebello Forebay Spreading Grounds • GRIP RW Project A – Replace recharge of 21,000 AFY of imported water with 11,000 AFY tertiary RW and 10,000 AFY AWT RW • GRIP RW Project B – Replace recharge of 21,000 AFY of imported water with 21,000 AFY tertiary RW	2017/2018 2015	Water Replenishment District of Southern California
Increased RW** for irrigation • Increase the volumes of recycled water for irrigation to reduce reliance on imported water and groundwater supplies	On-going	County Sanitation Districts of Los Angeles County
West Coast Basin		
100% Advanced Treated Recycled Water at West Coast Basin Barrier - increased recharge volume, increased injection volumes and replacement of imported water with advanced treated recycled water	2015	West Basin Municipal Water District
100% Advanced Treated Recycled Water at Dominguez Gap Barrier - increased recharge volume, increased injection volumes and replacement of imported water with advanced treated recycled water	2018/19	City of Los Angeles
Expansion of Goldsworthy De-salter and increased groundwater pumping for treatment by the Goldsworthy De-salter and Brewer De-salter	2015	Water Replenishment District of Southern California
Increased recharge at Dominguez Gap Spreading Grounds	2015	Los Angeles County Department of Public Works
Increased use of recycled water** for irrigation	On-going	County Sanitation Districts of Los Angeles County

***** These projects are expected to be implemented by or before the SNMP 2025 planning horizon.
** Using recycled water quality at Secondary MCLs for TDS and chloride and MCLs for nitrate-N..

Projected Impacts of Future Projects on Water Quality

A salt and nutrient management mixing model was developed to simulate/estimate groundwater quality over the planning period (through 2025). The mixing model was also used to evaluate the effects of planned future projects on overall groundwater quality and use of assimilative capacity in the CBWCB through WY 2024-25. The mixing model was developed in Microsoft Excel™ and consisted of a set of linked spreadsheets used to represent "continuously-stirred" mixing volumes for basins/subareas, and vertical modellayers.

The estimated current groundwater volume (provided by the MODFLOW regional groundwater flow model [USGS, 2003 and CH2MHILL, 2012b]) and associated salt and nutrient mass in storage (estimated from existing average groundwater quality) within the Central and West Coast Basins served as initial inputs into the mixing model. Several scenarios were evaluated. Results of the recommended scenario and the most likely alternative are provided in Table 8.1-6.

TABLE 8.1-6: PROJECTED IMPACT OF SALT AND NUTRIENT MANAGEMENT MEASURES ON BASIN WATER QUALITY

Basin/sub-basin	Impact of Projected Baseline Conditions & Recommended Future Projects (with GRIP A)*			Impact of Projected Baseline Conditions & Recommended Future Projects (with GRIP B)*		
Change (2010 to 2025) (mg/L)	**TDS**	**Cl**	**NO3-N**	**TDS**	**Cl**	**NO3-N**
Los Angeles Forebay	-0.6	1.6	0.15	-0.5	1.6	0.15
Montebello Forebay	-66.1	-0.7	0.16	-47.1	4.0	0.22
Whittier Area	-41.5	-3.1	0.05	-41.5	-3.1	0.05
Central Basin Pressure Area	18.8	8.2	0.13	20.0	8.4	0.14
Central Basin						
Change (2010 to 2025) (mg/L)	**1.1**	**5.6**	**0.14**	**4.7**	**6.5**	**0.15**
Assimilative Capacity Used (2010 to 2025) (%)	**0.7%**	**6.7%**	**1.4%**	**2.8%**	**7.8%**	**1.5%**
West Coast Basin						
Change (2010 to 2025) (mg/L)	**-56.8**	**-34.1**	**0.06**	**-56.7**	**-34.1**	**0.06**
Assimilative Capacity Used (2010 to 2025) (%)	**NC**	**NC**	**0.6%**	**NC**	**NC**	**0.6%**

TDS - total dissolved solids
AWT - advanced water treatment
MCL - maximum contaminant level
Cl - chloride
SMCL - secondary MCL
NO_3-N - nitrate as nitrogen
mg/L - milligrams per liter
NC - No assimilative capacity available
GRIP - Groundwater Reliability Improvement Program
GRIP A – GRIP Recycled Water Project A
GRIP B - GRIP Recycled Water Project B
"Overall Scenario" quantifies the impacts of the indicated future project/scenario in combination with existing projects in the CBWCB, i.e. including average baseline conditions (No Future Projects Scenario) continued through the future planning period
*Values reflect recycled water quality limits at secondary MCLs for TDS and chloride and MCL for nitrate

Salt and Nutrient Load Limits

The Central and West Coast Basins are currently being managed in a manner that addresses existing TDS and chloride impairments in localized areas, and proposes to maintain TDS, chloride and nitrate levels in the other areas of the basin below water quality objectives. Therefore assignment of allocations for salt and nutrient loading is not warranted at this time.

Monitoring Program

The SNMP Monitoring Program was developed based on WRD's Regional Groundwater Monitoring Program. Seventy (70) WRD nested groundwater monitoring wells (referred to as the SNMP monitoring wells) at 13 locations throughout the CBWCB were selected for the purpose of salt and nutrient monitoring and reporting (see Figure 8.1-2). Elements of the program are laid out in Table 8.1-7.

TABLE 8.1-7: MONITORING PROGRAM ELEMENTS

<table>
<tr><th>Element</th><th>Description</th></tr>
<tr><td>Responsible Agency</td><td>Water Replenishment District of Southern California</td></tr>
<tr><td>Program Origin</td><td>Water Replenishment District of Southern California's Regional Groundwater Monitoring Program (RGWMP)</td></tr>
<tr><td>Parameters and Monitoring Frequency</td><td>
<table>
<tr><th>Parameter</th><th>Monitoring Frequency</th></tr>
<tr><td>Total Dissolved Solids</td><td rowspan="3">Semi-Annually</td></tr>
<tr><td>Chloride</td></tr>
<tr><td>Nitrate</td></tr>
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</td></tr>
<tr><td>Monitoring locations</td><td>70 nested groundwater monitoring wells at 13 locations throughout the Central Basin and West Coast Basin (CBWCB); each nested well is screened in a specific aquifer, allowing the assessment of salts and nutrients in all the major aquifers of the CBWCB. These wells are located throughout the most critical areas of the basins, particularly their proximity to water supply wells and groundwater recharge projects that utilize recycled water, including the seawater intrusion barriers and the MFSG (Figure 8.1-2).</td></tr>
<tr><td>Reporting Requirements</td><td>Monitoring results will be reported annually. WRD will upload TDS, chloride, and nitrate data collected from the SNMP monitoring wells to the State Water Board's online GeoTracker database.</td></tr>
<tr><td>Additional Resources</td><td>WRD's annual Regional Groundwater Monitoring Report (RGWMR), which provides maps depicting chloride, TDS, and nitrate concentrations in all the RGWMP wells and active drinking water wells; chloride and TDS trend graphs for the SNMP monitoring wells; and a discussion of salt and nutrient concentrations and trends in groundwater with respect to water quality objectives established in the Basin Plan to assess overall groundwater quality in the CBWCB. The RGWMR is sent to the CBWCB water purveyors and can be downloaded from the WRD website:
http://www.wrd.org/engineering/groundwater-engineering-reports.php

WRD's online Geographical Information System (GIS) database provides groundwater quality data, well locations, well construction, and water levels for active production wells and all the RGWMP wells:
http://gis.wrd.org/wrdmap/login.asp</td></tr>
<tr><td>Review Period and Re-opener</td><td>TDS, chloride, and nitrate data collected from the SNMP monitoring wells will be reviewed periodically to validate model predictions regarding changes to basin water quality.</td></tr>
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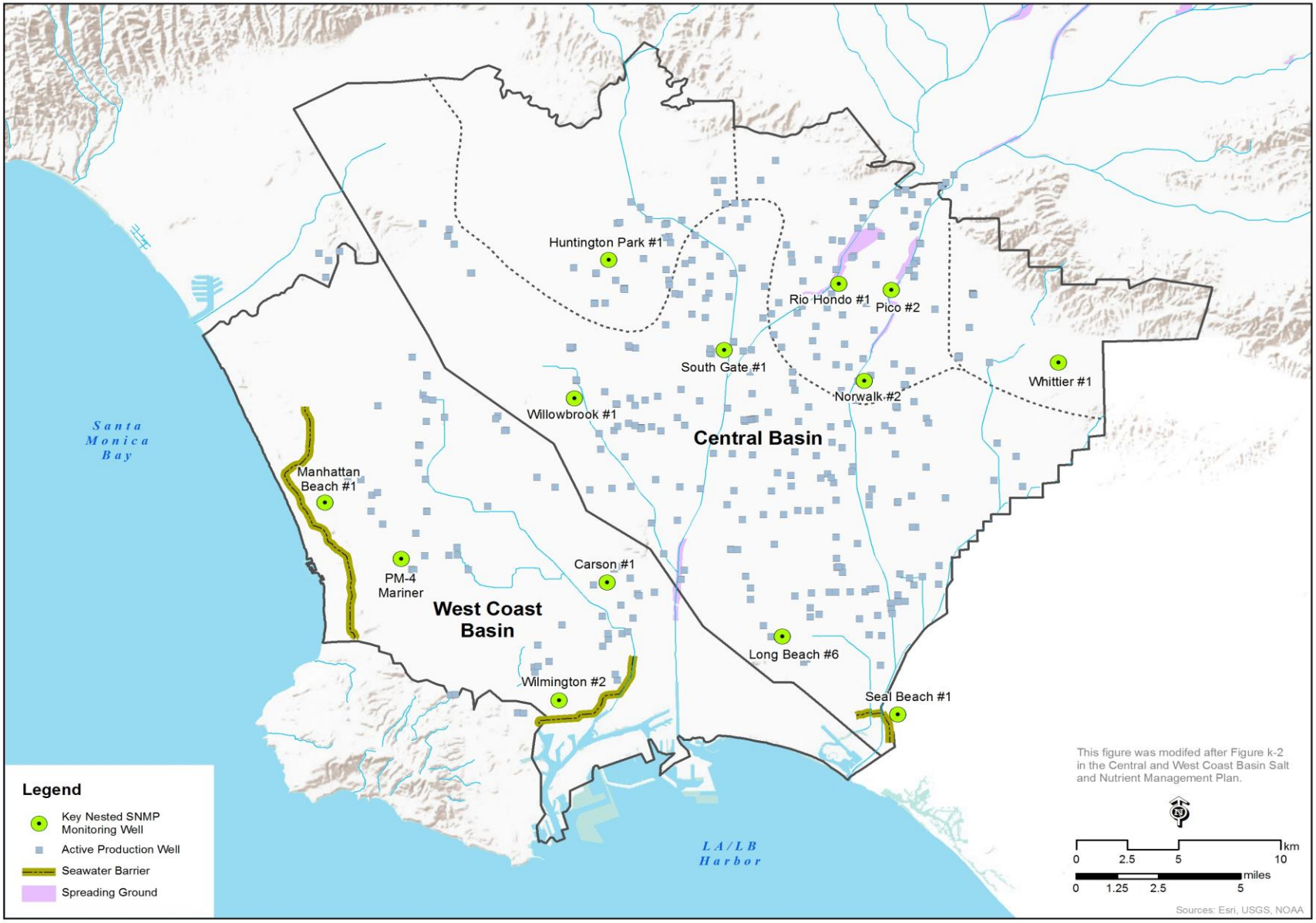

Figure 8.1-2. Location of SNMP Monitoring Wells in the Central Basin and West Coast Basin.

Updates to the Salt and Nutrient Management Measures

Salt and nutrient management measures will be updated (i) as necessary to reflect changing conditions in the CBWCB (i.e. in accordance with actions that have been taken or in response to proposed actions not taken), (ii) where results from the SNMP Monitoring Program indicate that revisions/ modifications are warranted, and/or (iii) at the end of the planning horizon (i.e. 2025).

Regulatory Implications

The salt and nutrient management strategies developed by local water entities in the Central Basin and West Coast Basin are voluntary measures that are designed to maintain water quality that is protective of beneficial uses. Except for the permitting of existing and proposed facilities/projects, further Regional Water Board action pertaining to these implementation measures geared toward controlling salt and nutrient loading to these basins will only be necessary where data and/or other information indicate that the projected water quality conditions are not being met.