Chapter 2
EXISTING FACILITIES

2.1 Sanitation Districts of Los Angeles County

The Sanitation Districts of Los Angeles County (Sanitation Districts) serve the regional wastewater and solid waste management needs of approximately 5.4 million people in Los Angeles County. The Sanitation Districts' service area, as shown on Figure 1-1, covers approximately 820 square miles and encompasses 78 cities and unincorporated territory within the county. The 23 separate districts that comprise the Sanitation Districts work cooperatively under a Joint Administration Agreement with one administrative staff headquartered near the city of Whittier. The individual districts operate and maintain their own portions of the collection system. Seventeen of the 23 districts with a population of 4.8 million people, collectively known as the Joint Outfall Districts (JOD), are served by the Joint Outfall System (JOS). Cities serviced by the Sanitation Districts are identified in Table 2-1.

Table 2-1. Cities Located Within the Sanitation Districts' Service Area

Joint Outfall District Cities			
Alhambra	Downey	Lomita	Rosemead
Arcadia	Duarte	Long Beach	San Dimas
Artesia	El Monte	Los Angeles	San Gabriel
Azusa	El Segundo	Lynwood	San Marino
Baldwin Park	Gardena	Manhattan Beach	Santa Fe Springs
Bell	Glendora	Maywood	Sierra Madre
Bell Gardens	Hawaiian Gardens	Monrovia	Signal Hill
Bellflower	Hawthorne	Montebello	South El Monte
Bradbury	Hermosa Beach	Monterey Park	South Gate
Carson	Huntington Park	Norwalk	South Pasadena
Cerritos	Inglewood	Palos Verdes Estates	Temple City
City of Commerce	Irwindale	Paramount	Torrance
City of Industry	La Cañada Flintridge	Pasadena	Vernon
Claremont	La Habra Heights	Pico Rivera	Walnut
Compton	La Mirada	Pomona	West Covina
Covina	La Puente	Rancho Palos Verdes	Whittier
Cudahy	La Verne	Redondo Beach	
Culver City	Lakewood	Rolling Hills	
Diamond Bar	Lawndale	Rolling Hills Estates	
Cities Outside the Joint Outfall System			
Beverly Hills	Palmdale	West Hollywood	
Lancaster	Santa Clarita		

2.2 Joint Outfall System

The JOS is a regional interconnected system that provides wastewater conveyance and treatment, water reuse, and effluent disposal for residential, commercial, and industrial users within the jurisdictions of the JOD.

The JOS can be divided into the following five program components areas:

- Wastewater conveyance and treatment – 480 miles of Joint Outfall (JO) trunk sewers, six upstream water reclamation plants (WRPs), and the Joint Water Pollution Control Plant (JWPCP)
- WRP effluent management – the beneficial reuse of recycled water or the discharge of treated effluent into rivers and creeks
- Solids processing – sludge thickening, sludge stabilization, and sludge dewatering at the JWPCP
- Biosolids management – offsite beneficial use and landfill co-disposal of biosolids
- JWPCP effluent management – the use of two onshore tunnels and four offshore ocean outfalls to convey treated effluent from the JWPCP for discharge to the Pacific Ocean through a system of diffusers

The JOS facilities that constitute each of the program component areas are shown in Table 2-2. The location of the JOS, the existing JOS treatment facilities, and the participating cities within the JOS are identified on Figure 1-2 and Figure 2-1.

Table 2-2. JOS Facilities Addressed Within Each Program Component Area

Program Component Area	JOS Facilities
Wastewater Conveyance and Treatment	Conveyance System WRPs JWPCP
WRP Effluent Management	WRPs
Solids Processing	JWPCP
Biosolids Management	JWPCP
JWPCP Effluent Management	JWPCP

2.2.1 JOS 2010 Master Facilities Plan

In 1995, the Sanitation Districts adopted the JOS 2010 Master Facilities Plan (2010 Plan) (Jones & Stokes 1994). The 2010 Plan was prepared to meet the wastewater management needs until the year 2010 and to provide for full secondary treatment of all ocean discharge as required by a consent decree between the Sanitation Districts, the United States Environmental Protection Agency (EPA), the state of California, the Natural Resources Defense Council, and Heal the Bay. The JWPCP was upgraded to full secondary treatment in 2002.

The population forecasts used for the 2010 Plan were derived from the Southern California Association of Governments 1994 Regional Comprehensive Plan. The 1994 Regional Comprehensive Plan population forecast indicated that the JOS service area would increase to more than 5.2 million people by 2010.

FIGURE 2-1

Existing Joint Outfall System Regional Setting

CLEARWATER Program

Source: Sanitation Districts of Los Angeles County 2011, Thomas Bros. 2011, ESRI 2011

2.2.2 Service Area Population and Wastewater Flows

The JOS facilities currently serve approximately 4.9 million people. As of 2008, 430 million gallons per day (MGD) of residential, commercial, and industrial wastewater were generated within the JOS. The permitted treatment capacity of the entire JOS is 593 MGD. A detailed description of the existing wastewater flows is provided in Chapter 4 of the Clearwater Program Master Facilities Plan (MFP).

2.2.3 Regional Setting

The JOS is located in the central, southern, and eastern portions of Los Angeles County. Its boundaries extend from the San Gabriel Mountain foothills south to the Palos Verdes Peninsula and San Pedro Bay, and from San Bernardino and Orange Counties west to the cities of Glendale and Los Angeles and to Santa Monica Bay, as shown on Figure 2-1.

The three major rivers in the JOS service area are the Rio Hondo, Los Angeles, and San Gabriel. Major creeks include San Jose and Coyote. The locations of these rivers and creeks are shown on Figure 2-1. The Rio Hondo River flows southwest from its headwaters at the Sawpit Dam into the Los Angeles River, which discharges into the Pacific Ocean. The San Gabriel River flows southwesterly from its headwaters in the San Gabriel Mountains and forms a tidal prism before discharging into the Pacific Ocean at Seal Beach. The tidal prism of the San Gabriel River is the area within the river where freshwater from upstream sources mixes with salt water from the Pacific Ocean.

There are two major spreading grounds in the JOS service area for recharging groundwater into the Los Angeles area groundwater basins. The Rio Hondo Spreading Grounds are located on the Rio Hondo River in the city of Montebello. The San Gabriel Coastal Spreading Grounds are located on the San Gabriel River in the city of Pico Rivera. The locations of these spreading grounds are shown on Figure 2-1. Both of these spreading grounds use Sanitation Districts' recycled water, water imported from the State Water Project, and rainwater to recharge the groundwater basin through percolation.

Six upstream WRPs produce recycled water for beneficial reuse (e.g., landscape irrigation) and are permitted to discharge recycled water into the receiving water bodies discussed above. The locations of the six WRPs are shown on Figure 2-1. The San Jose Creek Water Reclamation Plant (SJCWRP), located in an unincorporated area of Los Angeles near the city of Whittier, discharges into San Jose Creek and the San Gabriel River. The Pomona Water Reclamation Plant (POWRP), located in the city of Pomona, discharges into the south fork of San Jose Creek. The Los Coyotes Water Reclamation Plant (LCWRP), located in the city of Cerritos, discharges into the San Gabriel River. The Long Beach Water Reclamation Plant (LBWRP), located in the city of Long Beach, discharges into Coyote Creek. In addition, a portion of the recycled water is further treated and injected into the ground at the Alamitos Seawater Barrier to prevent saltwater intrusion into the freshwater aquifer. The Whittier Narrows Water Reclamation Plant (WNWRP), located in the city of South El Monte, discharges into the Rio Hondo River, the Rio Hondo Spreading Grounds, and the San Gabriel Coastal Spreading Grounds. The La Cañada Water Reclamation Plant (LACAWRP), located in the city of La Cañada Flintridge, discharges recycled water into irrigation system storage impoundments at a nearby golf course. The final destination for recycled water that is not beneficially reused is the Pacific Ocean, where the Los Angeles and San Gabriel Rivers outlet in the Port of Los Angeles and Seal Beach, respectively.

Solids generated at the six upstream WRPs, as a byproduct of the primary and secondary treatment processes, are returned to the JOS conveyance system for consolidated solids processing at the JWPCP. The JWPCP is located in the city of Carson as shown on Figure 2-1. Once thickened, stabilized, and dewatered at the JWPCP, the final solids product, called biosolids, is transported via trucks to locations within California and the greater southwest for beneficial use and landfill co-disposal.

After wastewater is treated at the JWPCP, it is conveyed in two onshore tunnels from the west side of the JWPCP across Lomita Boulevard and along Vermont and Western Avenues south to Royal Palms Beach. There, the two onshore tunnels converge into a subterranean manifold structure, which connects the onshore tunnels to the offshore outfalls. The outfalls, which consist of seafloor piping, extend from the shore to the diffuser area. The diffusers, which also consist of seafloor piping, have ports that allow the evenly distributed release of secondary-treated effluent into the ocean. Currently, there are four offshore outfalls and diffusers, but only two operate on a regular basis. These outfalls and diffusers extend into the Pacific Ocean approximately 1.5 miles to the south of the Palos Verdes Peninsula. The existing ocean discharge system is shown on Figure 2-2.

2.2.4 Existing Joint Outfall System Facilities

2.2.4.1 Conveyance System

The Sanitation Districts own, operate, and maintain over 1,230 miles of sewers within the JOS. There are approximately 8,500 miles of sewers feeding into the Sanitation Districts' system that are owned and operated by local cities and Los Angeles County. The backbone of the Sanitation Districts' JOS conveyance system consists of nine large, main trunk sewers, referred to as the JO trunk sewers, which collect wastewater from smaller district trunk and local sewers for conveyance to the six upstream WRPs and the JWPCP.

Higher quality residential wastewater is conveyed to the upstream WRPs, where it is treated to a level suitable for reuse or for discharge into nearby rivers and creeks. All solids removed at the six upstream WRPs are returned to the sewer system and conveyed to the downstream JWPCP for processing.

The JO trunk sewers were the focus of the analysis in the MFP due to their critical role in conveying wastewater flow throughout the entire JOS. The lengths of the JO trunk sewer lines are summarized in Table 2-3 and depicted on Figure 2-3.

Table 2-3. Joint Outfall Trunk Sewer Summary

Joint Outfall (JO) Trunk Sewers	Length (miles)
JO A	108
JO B	102
JO C	45
JO D	23
JO E	16
JO F	24
JO G	13
JO H	114
JO J	35
Total	480

The Sanitation Districts regularly monitor and evaluate the condition of individual sewer segments using closed circuit television, physical inspections, and flow meters. Identified system deficiencies are addressed through sewer relief, repair, rehabilitation, and replacement projects. Sewer pipes are generally

FIGURE 2-2

CLEARWATER Program

Existing Ocean Discharge System

Source: Sanitation Districts of Los Angeles County 2011, Thomas Bros. 2011, ESRI 2011

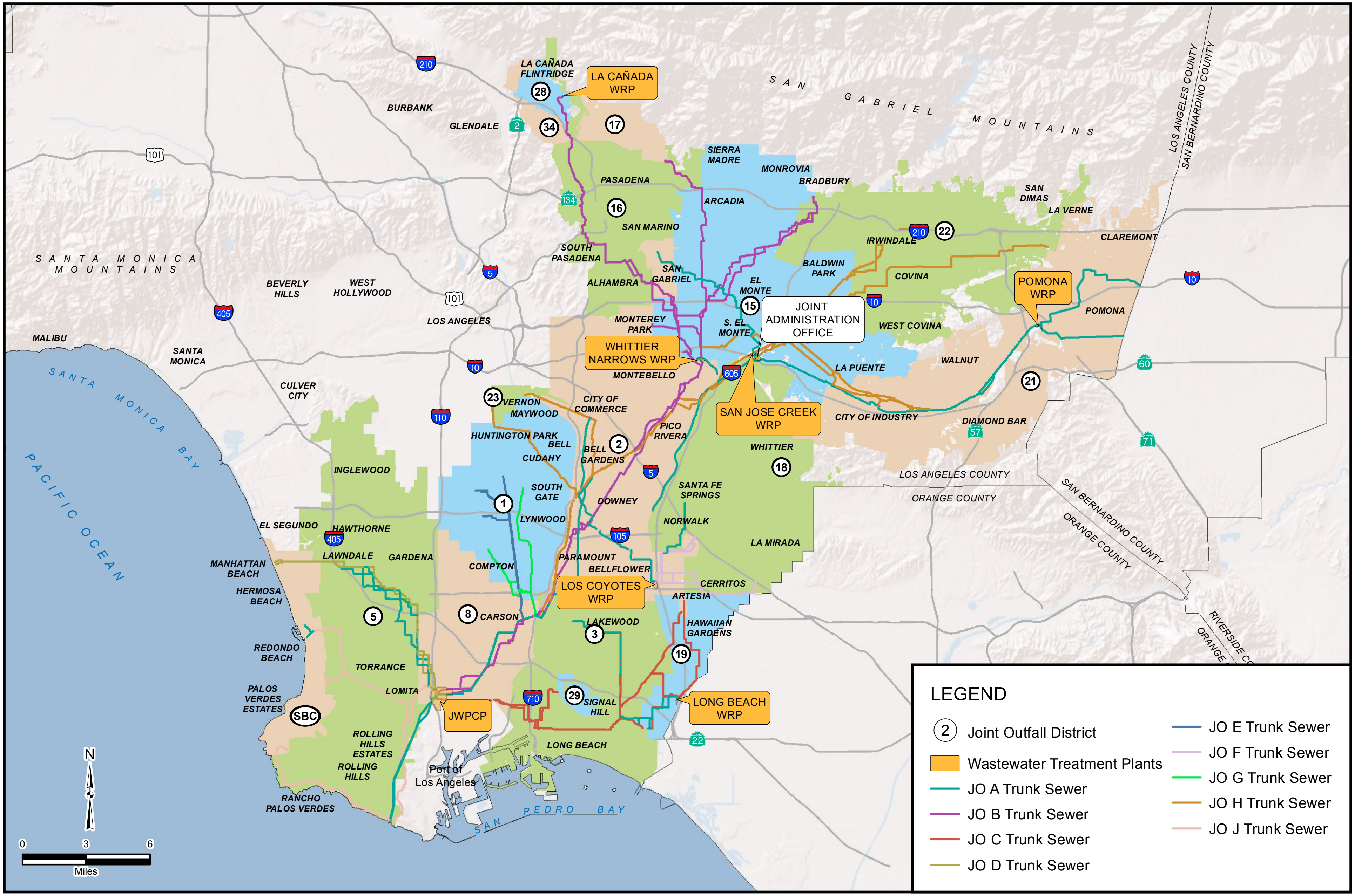

FIGURE 2-3

Joint Outfall Trunk Sewer System

Source: Sanitation Districts of Los Angeles County 2011, Thomas Bros. 2011, ESRI 2011

located from 5 to 25 feet underground and within public rights-of-way. Aside from manhole covers and pump stations, there is little physical or visual evidence of the system above ground.

Prior to each wet season, the JOS system configuration is slightly modified to take advantage of available sewer capacity by adjusting stop logs, gates, and other flow control devices in the system.

2.2.4.2 Water Reclamation Plants

Wastewater treatment at the WRPs described herein includes primary, secondary, and tertiary treatment.

- Primary treatment – occurs in settling tanks where the solid materials settle to the bottom, floatable materials are skimmed from the top and both are removed for treatment.
- Secondary treatment – microorganisms (mainly bacteria) are added to the wastewater in aeration tanks to feed on the remaining organic materials with the aid of air that is bubbled through the water. The organisms are removed from the water in secondary settling tanks and returned to the aeration tanks to begin the process again.
- Tertiary treatment – filters made of coal, sand, and gravel, remove nearly all of the remaining suspended materials. A disinfectant is added to kill any remaining bacteria, viruses, or other microorganisms.

The six WRPs located upstream of the JWPCP produce high quality treated water for reuse and provide hydraulic relief for the downstream conveyance, treatment, and disposal system. In addition to the discharge requirements for various constituents, each of the WRPs has a permitted monthly average dry weather flow rate. This capacity cannot be exceeded without a change to the facility's National Pollutant Discharge Elimination System permit. Treated flows for individual WRPs are monitored relative to the permitted capacity. Generally, WRP flows fluctuate over a period of years reflecting different conditions within the JOS service area. As an example, during low rainfall periods, flows may be reduced. During periods of higher precipitation, flows can increase significantly. The existing permitted capacities are summarized in Table 2-4. These capacities are based on the design capacity of the plant. Each plant has a modular design that sets the basis for operations and maintenance of the plant, as well as providing the basis for any incremental expansions in the future.

Table 2-4. WRP Permitted Capacities, Solids Conveyance, and Effluent Management Practices

Water Reclamation Plant	Permitted Capacity (MGD)	Solids Conveyance Joint Outfall (JO) Trunk Sewer	Groundwater Replenishment[a] (MGD)	Other Reuse[a] (MGD)
SJCWRP	100.0	JO H	16–36	1–9[b]
POWRP	15.0	JO A	2–7	0–6
LCWRP	37.5	JO F	0	2–6[b]
LBWRP	25.0	JO C	0	1–10
WNWRP	15.0	JO B	0.4–7	0–2
LACAWRP	0.2	JO B	0	0.1

[a] Based on recycled water and reuse flows for calendar year 2008.

[b] The Central Basin Municipal Water District recycled water distribution system receives a combination of recycled water from both the SJCWRP and LCWRP, which was accounted for under the LCWRP in the 2008 Annual Monitoring Report. However, this table accounts for the recycled water under the SJCWRP because most of the recycled water delivered through the system actually originated from the SJCWRP.

Reuse is an integral part of WRP effluent management. Recycled water produced at the WRPs is utilized for beneficial reuse either through groundwater replenishment via discharge to the San Gabriel and Rio

Hondo tributaries, which flow to unlined portions of the receiving water or designated spreading grounds, or by providing recycled water to numerous water wholesalers or purveyors for distribution. These wholesalers and purveyors make recycled water available to approximately 550 individual reuse sites in 27 cities for different applications that include irrigation, industrial use, agriculture, and groundwater recharge. The remaining recycled water is discharged into the lined portions of the receiving water bodies.

San Jose Creek Water Reclamation Plant

The SJCWRP, shown on Figure 2-4, is located at 1965 Workman Mill Road on a 51-acre site within unincorporated Los Angeles County, near the city of Whittier. The SJCWRP is bisected by Interstate (I-) 605 into two independent, but hydraulically interconnected, plants known as SJCWRP East and SJCWRP West. The site is bounded by San Jose Creek, State Route (SR-) 60, Workman Mill Road, and the San Gabriel River. The Sanitation Districts' Joint Administration Office is also located at this site. Additional facilities at the SJCWRP include a laboratory, equipment storage, and administrative offices. Properties managed by the city of Los Angeles Department of Water and Power and the United States Army Corps of Engineers run along the northern side of the SJCWRP. Land uses surrounding the plant consist mostly of low-density residential areas that are intermixed with an industrial area to the south and open recreational space to the northeast.

As shown in Table 2-4, the permitted capacity of the SJCWRP is 100.0 MGD (62.5 MGD at SJCWRP East and 37.5 MGD at SJCWRP West). The SJCWRP consists of eight treatment modules, each having a capacity of 12.5 MGD. All solids generated by the plant are returned to the JO H trunk sewer for conveyance to the JWPCP for processing. An annual (2008) average of approximately 31 MGD of recycled water is reused at approximately 30 different sites. Reuse can vary from month to month and range from 18 to 41 MGD. Groundwater recharge is the largest beneficial use, with approximately 24 of the 31 MGD used for this purpose. The remaining reuse is mostly landscape irrigation. Groundwater recharge is accomplished by sending recycled water to the San Gabriel Coastal Spreading Grounds, the Rio Hondo Spreading Grounds, San Jose Creek, or the San Gabriel River. The remaining recycled water is discharged to the lined portion of the San Gabriel River approximately 8 miles south of the plant.

Pomona Water Reclamation Plant

The POWRP, shown on Figure 2-5, is located at 295 Humane Way on a 14-acre site in the city of Pomona. The POWRP is bounded by a railroad right-of-way and industrial uses to the north, the Humane Society and Humane Way to the east, and Elephant Hill to the west. Residential areas may be found farther north of the railroad and farther south of West Mission Boulevard.

As shown in Table 2-4, the permitted capacity of the POWRP is 15.0 MGD. The POWRP consists of three treatment modules, each having a capacity of 5.0 MGD. All solids generated by the plant are returned to the JO A trunk sewer for conveyance to the JWPCP for processing. An annual (2008) average of approximately 8 MGD of recycled water is reused at over 190 different sites. Reuse can vary from month to month and range from 7 to 8 MGD. Approximately 4 MGD are used for purposes such as irrigation and dust control. This reuse varies month to month from 0 to 6 MGD. The Pomona Water Department is the largest beneficial user, followed by the Walnut Valley Water District, the Spadra Landfill, and the Rowland Water District. Approximately 2 to 7 MGD of recycled water goes to groundwater replenishment through discharge to San Jose Creek, which ultimately flows into the San Gabriel River. Sections of San Jose Creek where this discharge occurs, and the section of the San Gabriel River into which San Jose Creek flows, are unlined allowing percolation of all of the recycled water into the groundwater below. The remainder of the recycled water is used for onsite purposes, such as wash water.

FIGURE 2-4

CLEARWATER Program

San Jose Creek Water Reclamation Plant

Source: Sanitation Districts of Los Angeles County 2011, LARIAC 2007

FIGURE 2-5

CLEARWATER Program

Pomona Water Reclamation Plant

Source: Sanitation Districts of Los Angeles County 2011, LARIAC 2007

Los Coyotes Water Reclamation Plant

The LCWRP, shown on Figure 2-6, is located at 16515 Piuma Avenue on a 34-acre site in the city of Cerritos. The treatment facilities occupy the southern portion of the site. The Iron-Wood Nine Golf Course occupies the remaining area. The LCWRP is bounded to the north by a Southern California Edison property, to the south by SR-91, to the east by I-605, and to the west by the San Gabriel River. Land uses surrounding the plant consist of light industrial areas to the north and south, and residential areas to the east and west. Caruthers Park is located west of the plant.

As shown in Table 2-4, the permitted capacity of the LCWRP is 37.5 MGD. The LCWRP consists of three treatment modules, each having a capacity of 12.5 MGD. All solids generated by the plant are returned to the JO F trunk sewer for conveyance to the JWPCP for processing. An annual (2008) average of approximately 3 MGD of recycled water is beneficially reused at over 260 reuse sites. Reuse includes landscape irrigation of schoolyards, golf courses, parks, nurseries, and greenbelts, and industrial use at local companies for carpet dying and concrete mixing. Reuse can vary from month to month and range from 2 to 6 MGD. The Central Basin Municipal Water District is the largest beneficial user, followed by the cities of Cerritos, Lakewood, and Bellflower. The remaining recycled water is discharged to the lined portion of the San Gabriel River that flows directly to the Pacific Ocean.

Long Beach Water Reclamation Plant

The LBWRP, shown on Figure 2-7, is located at 7400 E. Willow Street on a 17-acre site in the city of Long Beach. The LBWRP is bounded by Willow Street to the north, Coyote Creek to the south and east, and the San Gabriel River to the west. Land uses surrounding the plant include the Water Replenishment District's Leo J. Vander Lans Advanced Water Treatment Facility (AWTF) and El Dorado Park to the north, El Dorado Park Golf Course to the west, and residential areas to the south and east.

As shown in Table 2-4, the permitted capacity of the LBWRP is 25.0 MGD. The LBWRP consists of two treatment modules, each having a capacity of 12.5 MGD. All solids generated by the plant are returned to the JO C trunk sewer for conveyance to the JWPCP for processing. An annual (2008) average of approximately 6 MGD of recycled water is beneficially reused at over 50 sites. Reuse can vary from month to month and range from 1 to 10 MGD. Approximately 4.5 of the 6 MGD are utilized by the city of Long Beach for landscape irrigation of schoolyards, golf courses, parks, and greenbelts. Approximately 1.5 MGD is processed at the AWTF and injected into the Alamitos Seawater Barrier to prevent saltwater intrusion into the groundwater basin. The remaining recycled water is discharged into the concrete-lined portion of Coyote Creek, about 2,200 feet upstream from its confluence with the San Gabriel River. The San Gabriel River is lined from Coyote Creek confluence to the river estuary.

Whittier Narrows Water Reclamation Plant

The WNWRP, shown on Figure 2-8, is located at 301 N. Rosemead Boulevard on a 27-acre site near the city of South El Monte. The WNWRP surroundings are dominated by the Whittier Narrows Recreation Area to the north, undeveloped industrial areas to the south, Legg Lake and nurseries to the east, and largely unused utility areas to the west. The Rio Hondo River transects the northwest corner of the site.

As shown in Table 2-4, the permitted capacity of the WNWRP is 15.0 MGD. The WNWRP consists of three treatment modules, each having a capacity of 5.0 MGD. All solids generated by the plant are returned to the JO B trunk sewer for conveyance to the JWPCP for processing. An annual average of approximately 6 MGD of recycled water is reused at three different sites. Reuse can vary from month to month and range from 0 to 8 MGD. Groundwater recharge is currently the largest beneficial use, with approximately 5 of the 6 MGD used for this purpose. The remaining reuse is landscape irrigation. Recycled water is discharged to the Rio Hondo River, which flows south to the Rio Hondo Spreading Grounds. At times, recycled water is diverted to the San Gabriel Coastal Spreading Grounds.

FIGURE 2-6

CLEARWATER Program

Los Coyotes Water Reclamation Plant

Source: Sanitation Districts of Los Angeles County 2011, LARIAC 2007

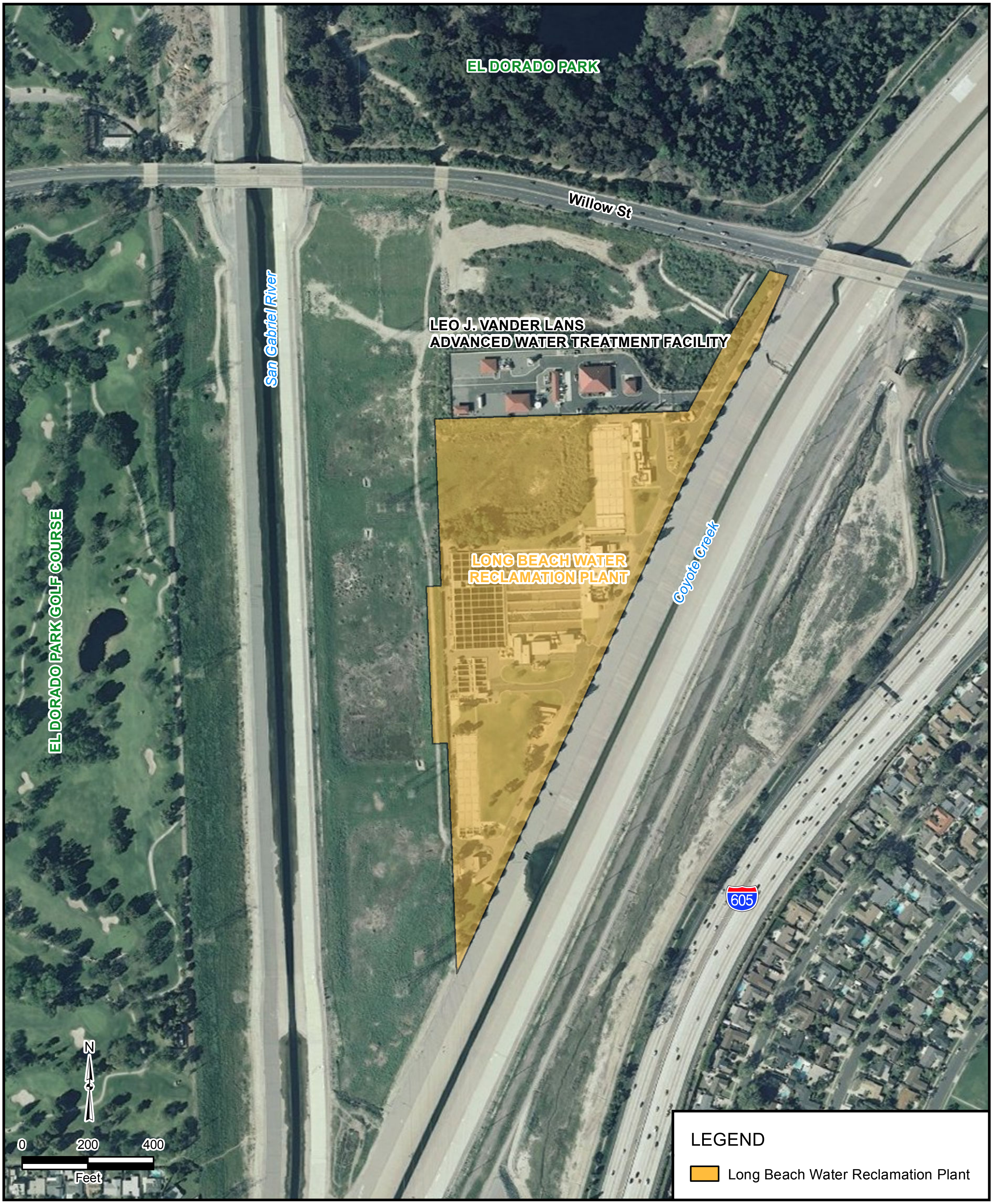

FIGURE 2-7

Long Beach Water Reclamation Plant

CLEARWATER Program

Source: Sanitation Districts of Los Angeles County 2011, ESRI 2011

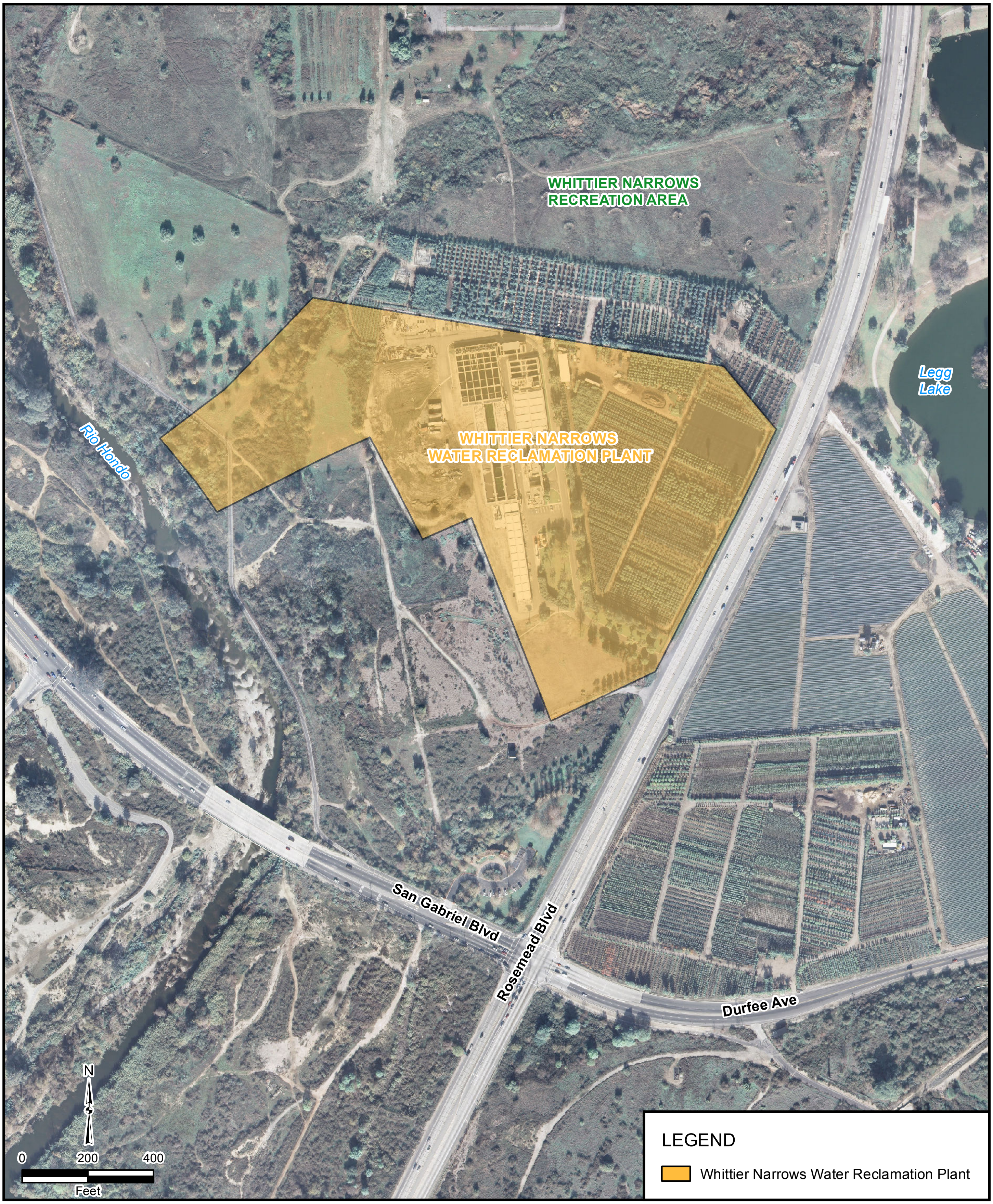

FIGURE 2-8

CLEARWATER Program

Whittier Narrows Water Reclamation Plant

Source: Sanitation Districts of Los Angeles County 2011, LARIAC 2007

Additionally, the Upper San Gabriel Valley Municipal Water District distributes recycled water for irrigation.

La Cañada Water Reclamation Plant

The LACAWRP, shown on Figure 2-9, is located at 533 Meadowview Drive on approximately one-third acre on the grounds of the La Cañada Flintridge Country Club. As shown in Table 2-4, the permitted capacity of the LACAWRP is 0.2 MGD. Solids generated by this plant are placed in an adjacent sewer, which connects to the JO B trunk sewer for conveyance to the JWPCP for processing. All of the recycled water flows into irrigation system storage impoundments on the 105-acre golf course. If the golf course is unable to take the recycled water (e.g., during periods of extended wet weather), flow from this plant can be partially, or entirely, bypassed to an adjacent sewer. No changes are proposed for this facility; therefore, it is not discussed in subsequent chapters.

2.2.4.3 Joint Water Pollution Control Plant

The JWPCP, shown on Figure 2-10, is located at 24501 S. Figueroa Street on an approximately 400-acre site in the city of Carson. It is generally bordered by West Sepulveda Boulevard to the north, Main Street to the east, West Lomita Boulevard to the south, and I-110 to the west. The Sanitation Districts lease land to the north of West Sepulveda Boulevard to landscaping and nursery businesses, to the east of Main Street to the Home Depot Retail Center, and to the south of West Lomita Boulevard to the Wilmington Jaycee Foundation for the Wilmington Athletic Complex and to the Wilmington Boys and Girls Club. These surrounding land uses provide a buffer between the JWPCP and more distant residential uses. In addition, the Sanitation Districts recently restored and dedicated the 17-acre Bixby Marshland located on the northwest corner of the JWPCP.

The surrounding land uses outside of the JWPCP property boundaries include commercial and retail to the east of Main Street, and residential uses to the south of West Lomita Boulevard. Wilmington Middle School is located approximately 0.25 mile from the southeastern property boundary of the JWPCP at the intersection of East Lomita Boulevard and Gulf Avenue.

The JWPCP is currently permitted to treat an average of 400 MGD of wastewater. The JWPCP provides primary and secondary treatment with disinfection. The JWPCP contains eight secondary treatment modules, each having a capacity of 50.0 MGD. Additionally, the JWPCP houses laboratory, equipment maintenance and storage, energy recovery, solids processing, and administrative and field office facilities.

Solids Processing

The solids generated at each of the six upstream WRPs during the wastewater treatment process are returned to the JO trunk sewers for conveyance to the JWPCP for centralized solids processing. The existing solids processing facilities are summarized in Table 2-5. The locations of the existing solids processing facilities at the JWPCP are shown on Figure 2-10.

FIGURE 2-9

CLEARWATER Program

La Cañada Water Reclamation Plant

Source: Sanitation Districts of Los Angeles County 2011, LARIAC 2007

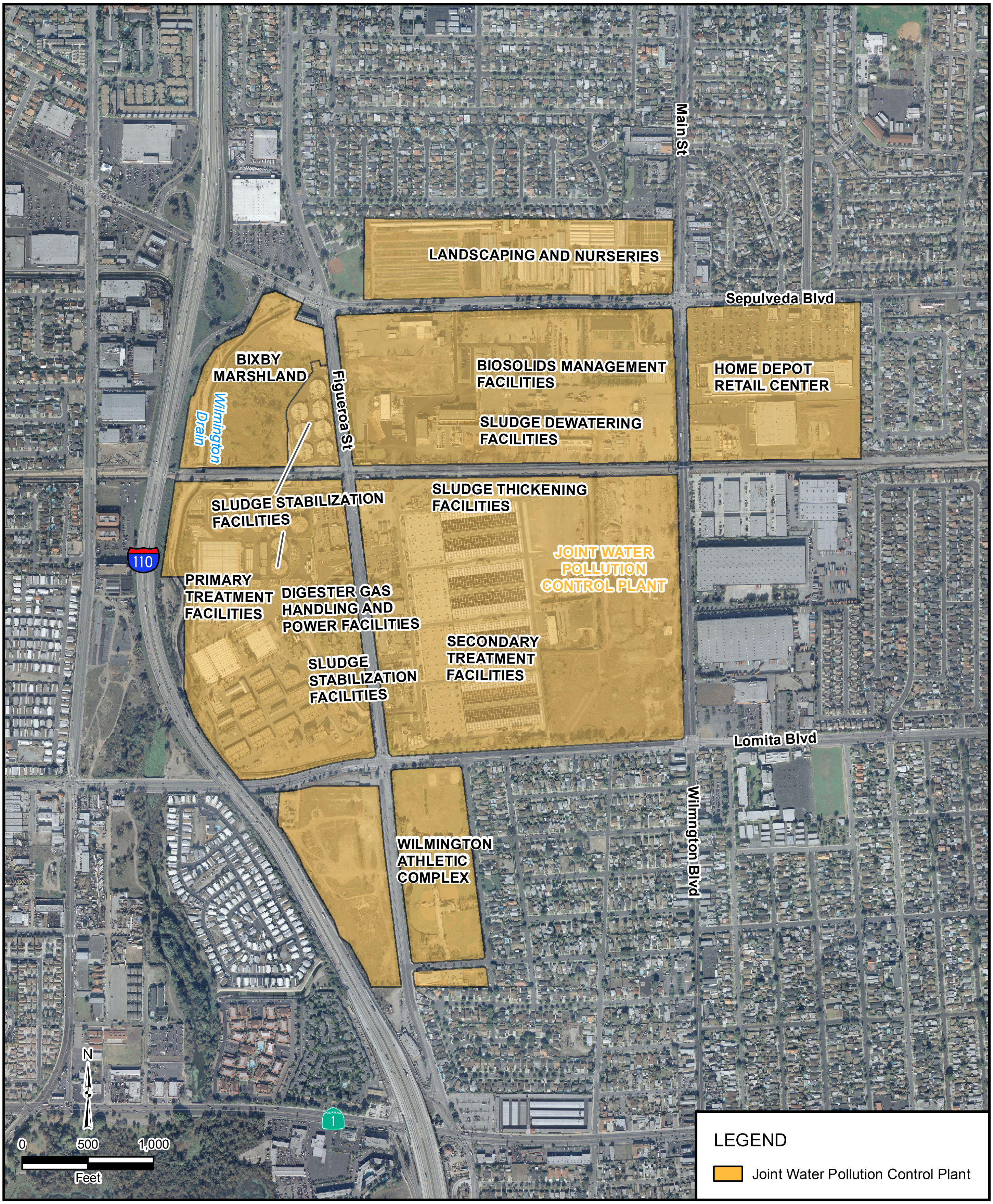

FIGURE 2-10

CLEARWATER Program

Joint Water Pollution Control Plant

Source: Sanitation Districts of Los Angeles County 2011, LARIAC 2007

Table 2-5. Existing Solids Processing Facilities

Process	Definition	Type	Units	Total Capacity
Sludge Thickening	Thickens waste activated sludge to reduce the overall volume of solids	Dissolved air flotation thickeners	6	11 MGD
Sludge Stabilization	Stabilizes and reduces pathogens to eliminate offensive odors and inhibit, reduce, or eliminate the potential for putrefaction; produces gas for power production	Anaerobic digesters	24	5 MGD
Sludge Dewatering	Removes liquid to further reduce volume of material and form it into a cake solid	Dewatering centrifuges	35	6 MGD
Digester Gas Handling and Power Generation	Generates electricity and power for the JWPCP as well as back to the grid from the gas produced from sludge stabilization	Combined cycle power plant with gas turbine generators and a steam turbine generator	1	Produces 22–26 MW

MW = megawatts

Sludge Thickening

The sludge thickening process is used to significantly reduce the volume of waste activated sludge (WAS). WAS is thickened at the site with dissolved air flotation thickeners. There are a total of six dissolved air flotation tanks that can process approximately 500,000 pounds per day of WAS. After the WAS is thickened, it is termed thickened waste activated sludge (TWAS).

Sludge Stabilization

The sludge stabilization process is used to reduce pathogens, eliminate offensive odors, and reduce the potential for putrefaction. Anaerobic digestion is used to stabilize primary sludge and TWAS. Approximately 50 percent of the organic matter is biologically converted to digester gas. The anaerobic digesters are operated as single-stage, high-rate units that use steam injection for heating and gas recirculation for continuous mixing. Digesters are heated to the operating temperature of 96°F to optimize performance. There are 24 conventional, circular digesters, each with a volume of approximately 500,000 cubic feet. This results in a combined volume of nearly 90 million gallons. The average detention time is from 15 to 18 days with 22 units in service. Typically, at any time, there may be one digester out of service for cleaning and another out of service on standby.

Sludge Dewatering

Sludge dewatering significantly reduces the volume of the material, as well as changes the form of the material from a liquid to a cake solid, also known as biosolids. This volume reduction and form change allows the subsequent transport of biosolids by truck.

Centrifuges are used to dewater the stabilized sludge into biosolids. The biosolids are transported by belt conveyors from the centrifuges to silos for storage and then loaded into trucks for hauling. There are a total of 18 silos at the JWPCP with a storage capacity of approximately 500 wet tons per silo, resulting in a total storage capacity of approximately 9,000 wet tons. At the 2007 biosolids generation rate of 1,450 wet tons per day (wtpd), this provides close to 6 days of storage. There are three separate truck loading stations serving the JWPCP with loading rates of approximately 175 wet tons per hour. There are also various odor control facilities to control biosolids odors at the JWPCP.

Digester Gas Handling and Power Generation

The gas produced during the anaerobic digestion process is collected and purified to generate electricity at the JWPCP. A combined cycle power plant uses gas turbine generators to produce approximately 18 to 20 megawatts (MW) of electricity and a steam turbine generator to produce approximately 4 to 6 MW of electricity. The electricity generated from this system is used on site. Heat is recovered from the combustion turbines and used to generate steam. The low-grade residual steam and hot water from the steam turbine, as well as steam from the boilers, are used for digester heating. The gas turbine generators were replaced and upsized in 2001. The steam turbine generator is being replaced with completion expected in 2011. There are also flare stations at the JWPCP to assist in the management of the digester gas.

Biosolids Management

The Sanitation Districts recycle biosolids for beneficial use along with co-disposal at a landfill. As of 2007, the JWPCP produces approximately 1,450 wtpd of biosolids. On an annual basis, this is approximately 530,000 wet tons per year. The location of the biosolids management facilities at the JWPCP is shown on Figure 2-10.

The EPA regulates biosolids pursuant to Code of Federal Regulations (CFR), Title 40, Part 503. The standards are applicable to land application, surface disposal, and incineration. For disposal in a municipal solid waste landfill, the biosolids must meet standards indicated in 40 CFR Part 258. Biosolids generated at the JWPCP meet EPA Class B pathogen reduction requirements through time and temperature requirements for anaerobic digestion. Vector attraction reduction requirements are met by reducing the mass of volatile solids during anaerobic digestion. JWPCP biosolids are sampled monthly and analyzed for total metals concentrations. Since the 1993 promulgation of the federal rules governing biosolids management, the JWPCP biosolids have consistently complied with the most stringent requirements related to metals concentrations. Because the biosolids generated at the JWPCP meet all federal requirements, they can generally be beneficially used at any location.

Beneficial Use

Beneficial use includes a diversified portfolio of options. Biosolids from the JOS are processed, temporarily stored, and transported from the JWPCP to various regional locations as shown on Figure 2-11 and described in Table 2-6. These beneficial use opportunities include:

- Composting and production of soil amendment products marketed for bulk and bagged sale
- Composting and land application
- Lime stabilization and land application
- Land application of dewatered Class B biosolids
- Incineration, pyrolysis, gasification, vitrification, emissions control, or other approved technologies to produce renewable fuel or other usable end products

Landfill Co-Disposal

Co-disposal of biosolids with municipal solid waste at landfills, as shown in Table 2-6, will continue to serve as an option for biosolids management. Landfills utilized will be appropriately permitted for biosolids co-disposal. While the focus of biosolids management will continue to be beneficial use, landfilling provides an important option. In 2007, approximately 10 percent of the total biosolids produced at the JWPCP were co-disposed with municipal solid waste at the Puente Hills Landfill.

FIGURE 2-11

CLEARWATER Program

Existing Biosolids Managment Locations

Source: Sanitation Districts of Los Angeles County 2011, Thomas Bros. 2011, ESRI 2011

Table 2-6. Existing Biosolids Management Practices

Facility	Management Practice	Location	Distance From JWPCP (miles)	Quantity (wtpy)	Total (%)
San Joaquin Composting Facility	Composting	Kern County, CA	170	50,000–150,000	10–30
South Kern Industrial Center	Composting	Kern County, CA	131	50,000–75,000	10–15
Inland Empire Regional Composting Facility	Composting	Rancho Cucamonga, CA	59	50,000–75,000	10–15
Honey Bucket Farms	Land Application w/ Lime Stabilization	Kern County, CA	163	25,000–75,000	5–15
Desert Ridge Farms	Land Application	Yuma County, AZ	290	25,000–75,000	5–15
EnerTech	Renewable Fuel	Rialto, CA	75	25,000–75,000	5–15
Mitsubishi Cement Corp	Injection for NO_X Control	San Bernardino County, CA	129	5,000–15,000	1–5
Puente Hills Landfill	Landfill Co-disposal	Los Angeles County, CA	27	50,000–200,000	10–40

wtpy = wet tons per year

Although co-disposal is not considered a direct beneficial use, the inclusion of biosolids within a landfill can lead to increased gas production, which enhances energy recovery.

Biosolids Transport

Transportation of biosolids from the JWPCP to the various biosolids management facilities occurs by truck. A typical truck can carry approximately 25 wet tons of biosolids. Approximately 55 trucks leave the JWPCP each day carrying biosolids, with the peak trips occurring between 5:00 a.m. and 2:00 p.m. Approximately 20,000 trucks per year transport biosolids from the JWPCP to beneficial reuse and landfill locations.

JWPCP Effluent Management

After the wastewater undergoes primary, secondary, and disinfection treatment, the final step is to discharge the treated effluent into the ocean. The existing ocean discharge system has a permitted dry weather capacity of approximately 400 MGD and can handle wet weather flows up to approximately 675 MGD. The current JWPCP effluent management ocean discharge system, shown on Figure 2-2 and Figure 2-12, extends from the JWPCP to the Pacific Ocean and consists of two parallel tunnels (8 and 12 feet in internal diameter), four separate ocean outfalls (60, 72, 90, and 120 inches in internal diameter), and four sets of diffusers. The tunnels are interconnected at the manifold located at the Royal Palms Beach on the Palos Verdes Peninsula. At the deepest point, the tunnels are approximately 600 feet below ground surface. The tunnels generally extend from the west side of the JWPCP across Lomita Avenue (past the Wilmington Drain) and along Vermont Avenue and Western Avenue south to the Royal Palms Beach. The tunnels have not been inspected for over 50 years due to the constant flow of treated effluent through both tunnels.

The underground reinforced concrete manifold structure at the Royal Palms Beach connects the onshore tunnels to the offshore outfalls and diffusers. Currently, there are four offshore outfalls and diffusers. However, only the two larger and longer outfalls (90-inch diameter and 120-inch diameter) are used on a regular basis. All four offshore outfalls and diffusers have been ballasted with rock for wave action and surge protection. The existing ocean outfall system is further described in Table 2-7.

FIGURE 2-12

Existing Facilities at Royal Palms Beach

Source: Sanitation Districts of Los Angeles County 2011, LARIAC 2007, ESRI 2011, AirPhoto USA 2006

Table 2-7. Existing Ocean Discharge System

Segment	Year Placed in Operation	Operational Status	Length (feet)	Material	Diffuser Length (feet)	Discharge Depth (feet)
8-foot Tunnel	1937	Operational	32,340	Reinforced Concrete	NA	NA
12-foot Tunnel	1958	Operational	32,340	Reinforced Concrete	NA	NA
60-inch Outfall	1937	Standby, only used during peak storm flows	4,900	RCP w/ CI Joints	400	110
72-inch Outfall	1947	Standby, only used during peak storm flows	7,150	RCP w/ CI Joints	666	160
90-inch Outfall	1957	Operational	10,394	RCP w/ CI Joints	2,416	196–210
120-inch Outfall	1966	Operational	11,880	RCP	4,440	167–190

RCP = reinforced concrete pipe
CI = cast iron
NA = not applicable
Source: Parsons 2011

The pesticide, dichlorodiphenyltrichloroethane (DDT), was manufactured at the Montrose Chemical Corporation plant in Torrance, California, from 1947 through 1983. From 1947 to1971, DDT was disposed of into Sanitation Districts' sewers and conveyed to the JWPCP. Local industries also discharged polychlorinated biphenyls (PCBs) into the Sanitation Districts' sewer system until PCBs were banned in 1976. The JWPCP had no means of removing or containing the DDT or PCBs, which were discharged along with the plant's effluent into the Pacific Ocean approximately 1.5 miles off White Point on the Palos Verdes Shelf. Since the 1970s, the contaminated sediment has been gradually buried by plant effluent and natural sediment, resulting in a layer of cleaner sediment on top of the contaminated sediment. In 1997, the Sanitation Districts entered into a consent decree with the EPA to address DDT/PCB contamination on the Palos Verdes Shelf. The EPA has conducted various studies and investigations to determine the extent of the contaminated area and to evaluate the appropriate remediation measures. In June 2009, the EPA released for public comment their proposed plan to address risks to human health and the environment posed by the contaminated sediment. The proposed plan presented the EPA's preferred alternative, as well as the other alternatives the EPA evaluated to address these risks. On September 30, 2009, the EPA signed an interim record of decision that selected an initial remedial action for the Palos Verdes Shelf of capping, monitored natural recovery, and institutional controls. The cleanup decision will be documented in a record of decision, supported by the EPA's remedial investigation/feasibility study.